Federal Energy Regulatory Commission
Office of Energy Projects

August 2014

Transcontinental Gas Pipe Line Company, LLC **Docket No. CP13-551-000**

Leidy Southeast Expansion Project

Environmental Assessment

Cooperating Agencies:

U.S. Army Corps of Engineers

U.S. Department of Transportation

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 1
Transcontinental Gas Pipe Line
Company, LLC
Leidy Southeast Expansion Project
Docket No. CP13-551-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared this environmental assessment (EA) for the Leidy Southeast Expansion Project (Project) proposed by Transcontinental Gas Pipe Line Company, LLC (Transco) in the above-referenced docket. Transco requests authorization to construct and operate certain natural gas pipeline facilities in various counties in New Jersey, Pennsylvania, Maryland, Virginia, and North Carolina to expand the natural gas delivery capacity to the northeast region of the United States by up to 525,000 dekatherms per day.

The EA assesses the potential environmental effects of the construction and operation of the Project in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed Project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The U.S. Army Corps of Engineers and U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the NEPA analysis.

The proposed Project includes the following facilities:

- installing approximately 29.8 miles of new 42-inch-diameter pipeline loop[1] in four separate segments in Mercer, Somerset, and Hunterdon Counties, New Jersey, and Monroe and Luzerne Counties, Pennsylvania;
- adding compression and modifying existing Compressor Stations 205, 515, 517, and 520 in Mercer County, New Jersey, and Luzerne, Columbia, and Lycoming Counties, Pennsylvania, respectively;

[1] A loop is a segment of pipe that is usually installed adjacent to an existing pipeline and connected to it at both ends. The loop allows more gas to be moved through the system.

- modifying existing compressor stations in North Carolina (1 facility), Virginia (5 facilities), and Maryland (1 facility); and
- modifying existing meter and regulating stations, mainline valves, and pig[2] launchers and receivers in North Carolina, Pennsylvania, Virginia, and Maryland.

The EA has been placed in the public files of the FERC and is available for public viewing on the FERC's website at www.ferc.gov using the eLibrary link. A limited number of copies of the EA are available for distribution and public inspection at:

Federal Energy Regulatory Commission
Public Reference Room
888 First Street NE, Room 2A
Washington, DC 20426
(202) 502-8371

Copies of the EA have been mailed to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; libraries in the Project area; and parties to this proceeding.

Any person wishing to comment on the EA may do so. Your comments should focus on the potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that your comments are properly recorded and considered prior to a Commission decision on the proposal, it is important that the FERC receives your comments in Washington, DC on or before **September 10, 2014.**

For your convenience, there are three methods you can use to submit your comments to the Commission. In all instances please reference the Project docket number (CP13-551-000) with your submission. The Commission encourages electronic filing of comments and has dedicated eFiling expert staff available to assist you at (202) 502-8258 or efiling@ferc.gov.

(1) You may file your comments electronically by using the eComment feature, which is located on the Commission's website at www.ferc.gov under the link to Documents and Filings. An eComment is an easy method for interested persons to submit brief, text-only comments on a project;

[2] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

(2) You may file your comments electronically by using the eFiling feature, which is located on the Commission's website at www.ferc.gov under the link to Documents and Filings. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "eRegister." You will be asked to select the type of filing you are making. A comment on a particular project is considered a "Comment on a Filing"; or

(3) You may file a paper copy of your comments at the following address:

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Although your comments will be considered by the Commission, simply filing comments will not serve to make the commentor a party to the proceeding. Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR 385.214).[3] Only intervenors have the right to seek rehearing of the Commission's decision.

Affected landowners and parties with environmental concerns may be granted intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which would not be adequately represented by any other parties. **You do not need intervenor status to have your comments considered.**

Additional information about the Project is available from the Commission's Office of External Affairs, at **(866) 208-FERC,** or on the FERC website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP13-551). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

[3] See the previous discussion on the methods for filing comments.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to http://www.ferc.gov/docs-filing/esubscription.asp.

Kimberly D. Bose,
Secretary

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TECHNICAL ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
µg/m3	micrograms per cubic meter
ACHP	Advisory Council on Historic Preservation
AMSL	above mean sea level
AQCR	air quality control regions
ASA	Agricultural Security Area
ATWS	additional temporary workspace
BCC	Birds of Conservation Concern
Bcf/d	billion cubic feet per day
BGEPA	Bald and Golden Eagle Protection Act
bgs	below the ground surface
CAA	Clean Air Act
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
COE	U.S. Army Corps of Engineers
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
dBA	decibels on the A-weighted scale
DOT	U.S. Department of Transportation
Dth/d	dekatherms per day
E&SCPs	Erosion and Sediment Control Plans
EA	Environmental Assessment
EI	Environmental Inspector
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESA 5	Environmentally Sensitive Area 5
F3	Fringe 3
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
GHGs	Greenhouse Gases
gpm	gallons per minute
GWP	global warming potential
HAP	hazardous air pollutants
HCA	high consequence area
HDD	horizontal directional drill
HDD Plan	Horizontal Directional Drill and Contingency Plan
hp	horsepower

INGAA	Interstate Natural Gas Association of America
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
M	Richter Magnitude
M&R	meter and regulating
MAOP	maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
MDNR	Maryland Department of Natural Resources
MLV	mainline valve
MMBtu/hr	million British thermal units per hour
MMI	Modified Mercalli Intensity
MP	milepost
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NHPA	National Historic Preservation Act
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJGS	New Jersey Geological Survey
NJNHP	New Jersey Department of Environmental Protection
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Planned Leidy Southeast Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings*
NO_x	nitrogen oxides
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSA	noise-sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
O_3	ozone
OEP	Office of Energy Projects
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PAFBC	Pennsylvania Fish and Boat Commission
PAGC	Pennsylvania Game Commission
PAGCLGS	Pennsylvania Governor's Center for Local Government Services
PATGS	Pennsylvania Topographic and Geologic Survey

Pb	lead
PHMSA	U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
Plan	*Upland Erosion Control, Revegetation, and Maintenance Plan*
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
Policy Statement	Statement of Policy on the Certification of New Interstate Natural Gas Pipeline Facilities
ppb	parts per billion
ppm	parts per million
PRC-1	Princeton Ridge Coalition Alternative 1
PRC-2	Princeton Ridge Coalition Alternative 2
PRCRP	Construction and Restoration Plan Developed Specifically for New Jersey State Planning Areas: Environmentally Sensitive Area 5 and Fringe 3, Along the Skillman Loop
Procedures	*Wetland and Waterbody Construction and Mitigation Procedures*
Project	Leidy Southeast Pipeline Project
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
Q/d	ratio of visibility-affecting emissions to distance
RCPs	Residential Construction Plans
Rock Handling Plan	Comprehensive Rock Handling Plan for the Princeton Ridge Segment of the Skillman Loop
Secretary	Secretary of the Commission
SERs	significant emission rates
SHPO	State Historic Preservation Office
SIL	significant impact level
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
State Plan	New Jersey State Development and Redevelopment Plan
tpy	tons per year
Transco	Transcontinental Gas Pipe Line Company, LLC
USC	United States Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compounds
WHPA	wellhead protection area

1.0 PROPOSED ACTION

1.1 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this environmental assessment (EA) to assess the potential environmental impact of the natural gas pipeline facilities proposed by Transcontinental Gas Pipe Line Company, LLC (Transco). We[1] prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations, Parts 1500-1508 [40 CFR 1500-1508]), and the Commission's implementing regulations under 18 CFR 380.

On September 30, 2013, Transco filed an application in Docket No. CP13-551-000 under Section 7(c) of the Natural Gas Act (NGA) and the certificate procedures of Part 157, Subpart F of the Commission's regulations for a Certificate of Public Convenience and Necessity (Certificate) authorizing construction and operation of natural gas pipeline facilities in various counties in New Jersey, Pennsylvania, Maryland, Virginia, and North Carolina. These proposed facilities are collectively referred to as the Leidy Southeast Expansion Project (Project) and are described in section 1.2. Prior to filing its application, Transco participated in the Commission's pre-filing process for the Project under Docket No. PF13-5-000.

The FERC is the lead federal agency for the preparation of this EA. The U.S. Army Corps of Engineers (COE) and U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA) are federal cooperating agencies who assisted us in preparing this EA because they have jurisdiction by law or special expertise with respect to environmental impacts associated with Transco's proposal.

The EA is an important and integral part of the Commission's decision on whether to issue Transco a Certificate to construct and operate the proposed facilities. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that could result from implementation of the proposed action;
- assess reasonable alternatives to the proposed action that would avoid or minimize adverse effects to the environment; and
- identify and recommend specific mitigation measures, as necessary, to minimize environmental impacts.

[1] "We," "us," and "our" refer to the environmental staff of the Commission's Office of Energy Projects.

1.2 PROPOSED FACILITIES

The Project generally consists of the following:

- installing approximately 29.8 miles of new 42-inch-diameter pipeline loop[2] in four separate segments in Mercer, Somerset, and Hunterdon Counties, New Jersey, and Monroe and Luzerne Counties, Pennsylvania;
- adding compression and modifying existing Compressor Stations 205, 515, 517, and 520 in Mercer County, New Jersey, and Luzerne, Columbia, and Lycoming Counties, Pennsylvania, respectively;
- modifying existing compressor stations in North Carolina (1 facility), Virginia (5 facilities), and Maryland (1 facility); and
- modifying existing meter and regulating (M&R) stations, mainline valves (MLV), and pig[3] launchers and receivers.

All of the proposed facilities would be owned and operated by Transco. Figure 1.2-1 depicts the location of the proposed pipeline loops and the existing compressor stations where compression would be added. U.S. Geological Survey (USGS) maps showing the locations of all Project facilities are included in appendix A.

There are no non-jurisdictional facilities associated with the proposed Project.

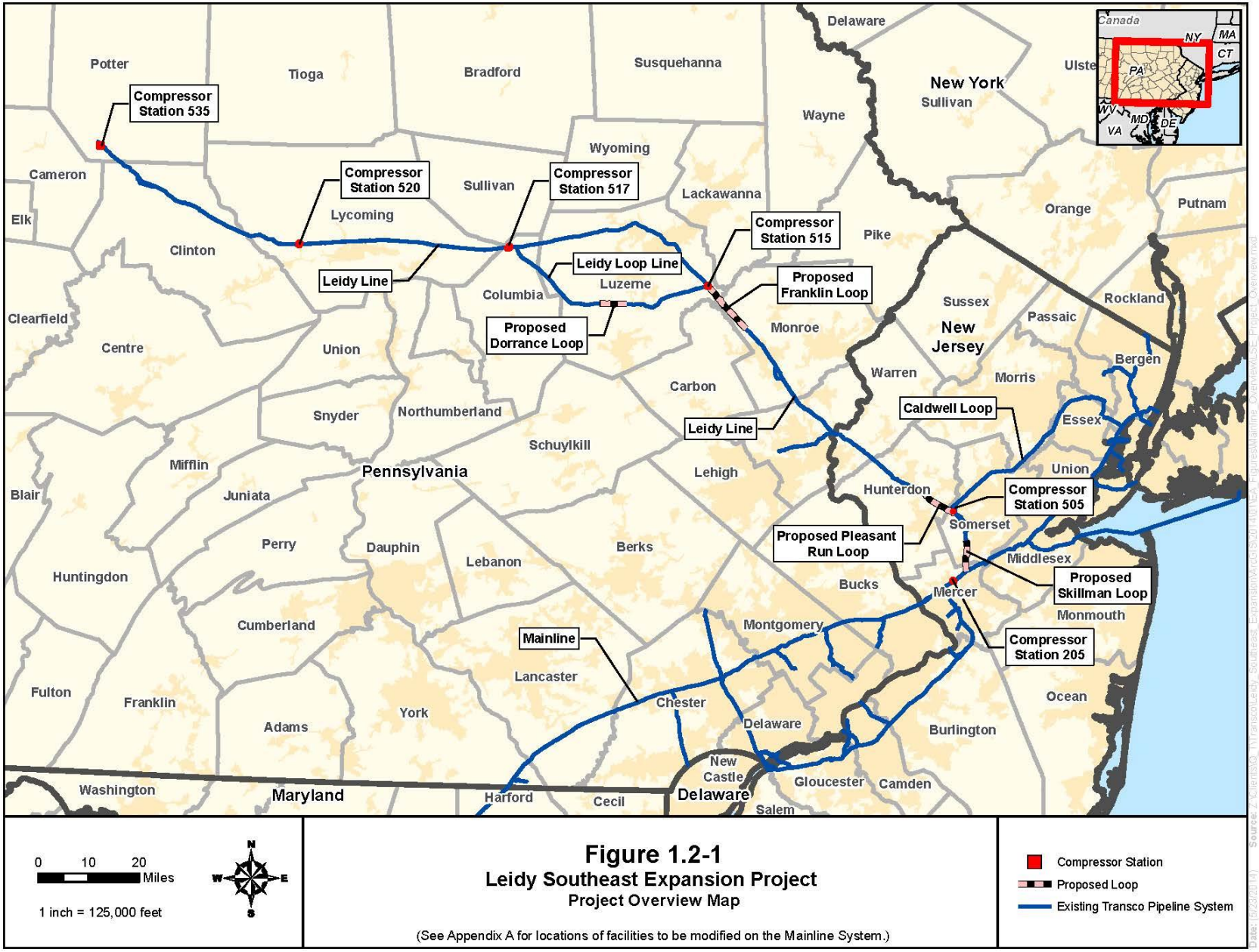
1.2.1 Pipeline Facilities

In the Project area, Transco's existing pipeline system includes the Mainline, which extends generally northeasterly for approximately 1,775 miles from Texas to New York City; and the Leidy Line, which extends generally east-to-west for approximately 200 miles from Hunterdon County, New Jersey to Potter County, Pennsylvania. In New Jersey, the Mainline system also includes the Caldwell Loop and in Pennsylvania, the Leidy Line also includes the Leidy Loop Line. In this EA, the proposed loops and compressor stations where compression would be added are generally discussed from east to west, and the other facility modifications on Transco's Mainline system are generally discussed from south to north, corresponding to the milepost (MP) convention used by Transco.

The proposed pipeline facilities are listed in table 1.2.1-1

[2] A loop is a segment of pipe that is usually installed adjacent to an existing pipeline and connected to it at both ends. The loop allows more gas to be moved through the system.

[3] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.


Compressor Station 535
Compressor Station 520
Compressor Station 517
Compressor Station 515
Leidy Line
Leidy Loop Line
Proposed Dorrance Loop
Proposed Franklin Loop
Leidy Line
Caldwell Loop
Compressor Station 505
Proposed Pleasant Run Loop
Proposed Skillman Loop
Compressor Station 205
Mainline
Potter
Tioga
Bradford
Susquehanna
Wayne
Delaware
New York
Sullivan
Ulster
Orange
Putnam
Rockland
Bergen
Passaic
Sussex
New Jersey
Warren
Morris
Essex
Union
Middlesex
Monmouth
Ocean
Burlington
Mercer
Somerset
Hunterdon
Bucks
Montgomery
Chester
Delaware
Lancaster
Berks
Lehigh
Carbon
Monroe
Pike
Wyoming
Lackawanna
Luzerne
Columbia
Sullivan
Lycoming
Clinton
Cameron
Elk
Clearfield
Centre
Union
Snyder
Northumberland
Schuylkill
Pennsylvania
Mifflin
Juniata
Blair
Perry
Dauphin
Lebanon
Huntingdon
Cumberland
Fulton
Franklin
Adams
York
Washington
Maryland
Harford
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New Castle
Delaware
Gloucester
Camden
Salem
Canada
NY
MA
CT
PA
WV
MD
DE
VA
0 10 20 Miles
1 inch = 125,000 feet
N
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E
S
Figure 1.2-1
Leidy Southeast Expansion Project
Project Overview Map
(See Appendix A for locations of facilities to be modified on the Mainline System.)
Compressor Station
Proposed Loop
Existing Transco Pipeline System

TABLE 1.2.1-1

Proposed Pipeline Facilities

Facility	County, State	Milepost [a] Begin	Milepost [a] End	Length (miles) [a]
Skillman Loop	Mercer and Somerset, NJ	1776.8	1783.0	6.2
Pleasant Run Loop	Somerset and Hunterdon, NJ	0.1	6.9	6.8
Franklin Loop	Monroe and Luzerne, PA	57.5	69.0	11.5
Dorrance Loop	Luzerne, PA	17.7	23.0	5.3
Total				29.8

[a] Mileposts for the proposed facilities are based on the milepost numbering convention on Transco's existing pipeline systems. Actual lengths are approximate due to milepost rounding.

Transco's systems in the Project area consist of at least one and as many as four pipelines, referred to as Lines A through D, typically located in a contiguous right-of-way. The Skillman Loop would parallel one existing pipeline (Caldwell Loop B) and would extend the Caldwell Loop D pipeline. The Pleasant Run Loop would parallel two existing Transco pipelines (Leidy Lines A and B) and would extend the Leidy Line C. The Franklin Loop would parallel three existing pipelines (Leidy Lines A, B, and C) and would extend the Leidy Line D. The Dorrance Loop would parallel two existing pipelines (Leidy Lines B and C within the Leidy Loop Line) and would extend the Leidy Line D.

The Skillman, Pleasant Run, Franklin, and Dorrance Loops would be installed at a typical offset of 25 feet from the nearest existing pipeline for 29.6 miles (99 percent) of the total loop length. Along the Skillman Loop, 1.3 miles (4 percent) of the Project would deviate from the existing right-of-way in conjunction with a horizontal directional drill (HDD) proposed to avoid a creek that parallels the right-of-way and to reduce impacts on nearby residences. Along the Pleasant Run Loop, 0.3 mile (less than 0.1 percent) would deviate from the existing right-of-way to approach a stream crossing at a more perpendicular angle, reduce forest impacts, and avoid electric transmission towers.

The land requirements for construction and operation of the pipeline facilities are discussed in sections 1.9 and 2.4.1 and are depicted on Transco's detailed alignment sheets.[4]

1.2.2 Aboveground Facilities

Compressor Stations

Proposed compressor stations associated with the Project are listed in table 1.2.2-1, and USGS maps depicting the locations of the aboveground facilities are included in appendix A.

[4] Transco's alignment sheets have been filed with FERC and can be viewed on the FERC website at http://www.ferc.gov. The Skillman Loop alignment sheets, updated and filed on May 6, 2014, can be found under Accession No. 20140506-5178. Alignments for the Pleasant Run, Franklin, and Dorrance Loops, updated and filed on March 6, 2014, can be found under Accession No. 20140307-5010.

TABLE 1.2.2-1

Proposed Modifications at Existing Compressor Stations

Compressor Station	County, State	Milepost [a]	Scope of Work
205	Mercer, NJ	Mainline 1773.4	2,000-horsepower (hp) uprate; modify existing electric compressor units and yard piping/valving.
515	Luzerne, PA	Leidy Line 69.0	Install one additional 16,000-hp compressor unit; modify existing compressor units and yard piping/valving.
517	Columbia, PA	Leidy Line 115.3	Install one additional 30,000-hp compressor unit; replace one 12,600-hp compressor unit with a new 16,000-hp compressor unit; modify existing compressor units and yard piping/valving.
520	Lycoming, PA	Leidy Line 147.3	Install one additional 20,500-hp compressor unit; modify existing compressor units and yard piping/valving.
145 (Grove Meter Station)	Cleveland, NC	Mainline 1247.1	Install back pressure regulator.
165	Pittsylvania, VA	Mainline 1413.0	Install deodorization facilities that filter odorant from gas stream prior to any planned release.
170	Appomattox, VA	Mainline 1457.0	Install deodorization facilities that filter odorant from gas stream prior to any planned release.
175	Fluvanna, VA	Mainline 1499.4	Install deodorization facilities that filter odorant from gas stream prior to any planned release.
180	Orange, VA	Mainline 1540.2	Install deodorization facilities that filter odorant from gas stream prior to any planned release.
185	Prince William, VA	Mainline 1583.4	Install deodorization facilities that filter odorant from gas stream prior to any planned release.
190	Howard, MD	Mainline 1628.8	Install deodorization facilities that filter odorant from gas stream prior to any planned release.

[a] Mileposts for the proposed facilities are based on the milepost numbering convention on Transco's existing pipeline systems.

Existing Compressor Station 205

Transco would uprate two existing compressor unit electric motors from 9,500 horsepower (hp) to 10,500 hp (for a total uprate of 2,000 hp) and modify valve piping at existing Compressor Station 205 in Lawrence Township, Mercer County, New Jersey. Total facility compression would increase to 64,000 hp following construction.

Existing Compressor Station 515

Transco would install a new 16,000-hp gas turbine compressor unit and modify yard piping at existing Compressor Station 515 in Buck Township, Luzerne County, Pennsylvania. Total facility compression would increase to 64,000 hp following construction.

Existing Compressor Station 517

Transco would install a new 30,000-hp gas turbine compressor unit and replace an existing compressor unit with a new 16,000-hp turbine at existing Compressor Station 517 in Jackson Township, Columbia County, Pennsylvania for a net increase of 14,000 hp. In addition, Transco would modify existing compressor units and yard piping, resulting in total facility compression of 72,000 hp following construction.

Existing Compressor Station 520

Transco would install a new 20,500-hp gas turbine compressor unit at existing Compressor Station 520 in Mifflin Township, Lycoming County, Pennsylvania. In addition, Transco would modify existing compressor units and yard piping, resulting in total facility compression of 55,700 hp following construction.

Existing Compressor Station 145 (Grove Meter Station)

Transco would install back pressure regulators at Compressor Station 145 in Cleveland County, North Carolina.

Existing Compressor Stations 165, 170, 175, 180, 185, and 190

Transco would install equipment needed to handle odorized gas at Compressor Stations 165, 170, 175, 180, 185, and 190 in Virginia and Maryland. Specifically, certain facilities within the compressor stations would be modified to remove odorant from the gas stream before normal operational releases (e.g., the cycling of a gas-powered valve actuator). Odorant would not be removed from the natural gas transported in Transco's pipeline systems.

Mainline Valves and Launchers/Receivers

Proposed MLV and pig launcher/receiver facilities associated with the Project are listed in table 1.2.2-2, and USGS maps depicting the locations of the aboveground facilities are included in appendix A.

TABLE 1.2.2-2

Proposed Mainline Valve and Launcher/Receiver Modifications

County, State/Facility	Milepost [a]	Scope of Work
Mercer County, NJ		
MLV200D27	Caldwell 1776.8	Modify existing MLV for installation of new MLV and tie-in facilities; install relocated bi-directional pig launcher/receiver from MLV200D28.
Somerset County, NJ		
MLV200D28	Caldwell 1783.0	Remove bi-directional pig launcher/receiver; relocate to MLV200D27.
MLV505LC11	Leidy Line 0.1	Modify existing MLV for installation of new MLV and tie-in facilities.
Monroe County, PA		
MLV505LD90	Leidy Line 57.5	Install new MLV, tie-in facilities, and bi-directional pig launcher/ receiver.
MLV505LD at MP 63.19	Leidy Line 63.2	Install new MLV.
Luzerne County, PA		
MLV515LD0	Leidy Line 69.0	Install new MLV, tie-in facilities, and bi-directional pig launcher/ receiver.
MLV515LD at MP 17.70	Leidy Loop Line 17.7	Install new MLV, tie-in facilities, and bi-directional pig launcher/ receiver.
MLV515LD at MP 22.97	Leidy Loop Line 23.0	Install new MLV, tie-in facilities, and bi-directional pig launcher/ receiver.

[a] Mileposts for the proposed facilities are based on the milepost numbering convention on Transco's existing pipeline systems.

Other Aboveground Facilities

Transco would modify various valve sites and M&R stations between Compressor Stations 165 and 190 in Virginia and Maryland to install facilities that manage odorized gas and filter odorant from the gas stream before any planned release. Transco would also add facilities that analyze odorant levels. These proposed aboveground facility modifications are listed in table 1.2.2-3, and shown on USGS maps included in appendix A.

1.2.3 Contractor/Pipe Storage Yards, Contractor Staging Areas, and Access Roads

Transco would require five contractor/pipe storage yards during construction of the Project to store machinery, equipment, construction material, and pipe (see table 2.4.1-3). Each of the contractor/pipe storage yards would be located outside of the pipeline construction right-of-way. Two yards would be in Somerset County, New Jersey to support the Skillman and Pleasant Run Loops; two yards would be in Monroe County, Pennsylvania, one to support the Franklin Loop and one to support construction of all four loops; and one yard would be in Luzerne County, Pennsylvania to support the Dorrance Loop. In addition, Transco would require 12 contractor staging areas to provide space for field offices, restroom facilities, and temporary parking of personal vehicles during construction activities (see table 2.4.1-3). Contractor staging areas would generally be adjacent to the pipeline construction right-of-way. The locations of proposed contractor/pipe storage yards and contractor staging areas are shown on the USGS maps in appendix A.

Transco would generally use public roads and the construction right-of-way for primary access to the pipeline loops and aboveground facilities during construction. In addition, Transco proposes to modify 16 private roads for access during construction. Twelve of the access roads would only be required during the construction phase of the Project and would be restored to their previous condition following use. The remaining four access roads would be permanently retained as access to MLV or pipe storage yard sites. Transco would also use two existing roads for construction and operational access to MLV sites; however, these roads would not require modification. Finally, Transco would construct five new roads for access to the construction workspace. Three of these roads would be removed and restored after construction and two would be retained for permanent access to MLV sites. The locations of temporary and permanent access roads required for the Project are shown on the USGS maps in appendix A and listed in appendix B.

1.3 PROJECT PURPOSE AND NEED

Transco's stated purpose of the Project is to provide an additional 525,000 dekatherms per day (Dth/d) of firm natural gas transportation capacity to delivery points that would be accessible by customers in the mid-Atlantic and Southeast states. In addition, Transco states it has entered into binding agreements with shippers for the entire capacity of the Project. Transco references projections by the Interstate Natural Gas Association of America (INGAA, 2011) that indicate an increasing demand for natural gas in the Southeast and Northeast regions of the United States, primarily for electric generation. Transco asserts that the proposed Project would help to meet the current and future demand for natural gas; provide access to new sources of domestic natural gas supply; and support the overall reliability of the energy infrastructure. Transco also asserts that existing natural gas transmission systems in the region (e.g., Texas

Eastern Transmission Company) are not presently capable of transporting the required volumes without expansion of existing systems or construction of a new system.

TABLE 1.2.2-3

Other Proposed Aboveground Facilities Modifications to Manage Odorized Gas

County, State	Facility	Milepost [a]
Pittsylvania County, VA	Columbia Gas of Virginia - AltaVista M&R Station	Mainline 1425.7
Campbell County, VA	Existing Launcher Site	Mainline 1436.3
	Columbia Gas of Virginia - Brookneal M&R Station	Mainline 1440.0
	Existing Valve Site 165-20	Mainline 1440.0
Appomattox County, VA	Columbia Gas of Virginia - Lynchburg M&R Station	Mainline 1451.5
	Columbia Gas of Virginia - Virginia Fibre M&R Station	Mainline 1466.4
Buckingham County, VA	CVG Bear Garden Interconnect M&R Station	Mainline 1493.0
Fluvanna County, VA	Columbia Gas of Virginia - Scottsville M&R Station	Mainline 1495.9
	Tenaska, Inc. - Antioch M&R Station	Mainline 1502.3
	Existing Valve Site 175-10	Mainline 1506.1
Louisa County, VA	Columbia Gas - Louisa Road M&R Station	Mainline 1519.9
	Columbia Gas - Boswells Tavern M&R Station	Mainline 1519.9
	Existing Valve Site 175-20	Mainline 1521.8
	Columbia Gas - Gordonsville Co-Gen M&R Station	Mainline 1523.4
Culpepper County, VA	Columbia Gas Transmission - Fredericksburg M&R Station	Mainline 1551.2
Fauquier County, VA	ODEC Marsh Run M&R Station	Mainline 1558.9
	Columbia Gas - Remington M&R Station	Mainline 1560.5
	Existing Valve Site 180-15	Mainline 1568.2
	Existing Valve Site 180-20	Mainline 1573.0
Prince William County, VA	Dominion Transmission - Nokesville M&R Station	Mainline 1575.7
	Columbia Gas - Prince William M&R Station	Mainline 1580.6
	Washington Gas Light - Bull Run M&R Station	Mainline 1583.4
Fairfax County, VA	Existing Valve Site 185-05	Mainline 1584.9
	Dominion Transmission - Pleasant Valley Interconnect M&R Station	Mainline 1586.2 [b]
	Existing Valve Site Cove Point	Mainline 1586.2
	Existing Valve Site 185-10	Mainline 1589.6
	Existing Valve Site 185-13	Mainline 1596.8
	Washington Gas Light - Herndon M&R Station	Mainline 1598.8
	Existing Receiver Site	Mainline 1603.8
	Existing Valve Site Potomac South	Mainline 1603.9
Montgomery County, MD	Existing Valve Site Potomac North	Mainline 1604.6
	Existing Valve Site 185-17	Mainline 1610.3
	Rockville M&R Station	Mainline 1611.6
	Westmore Road M&R Station	Mainline 1611.8
	Existing Valve Site 185-20	Mainline 1616.2
	Washington Gas - Rock Creek M&R Station	Mainline 1614.5
Howard County, MD	Existing Valve Site 185-25	Mainline 1623.1
Baltimore County, MD	Existing Valve Site 190-10	Mainline 1642.5
	Existing Valve Site 190-13	Mainline 1650.0
Harford County, MD	Existing Valve Site 190-20	Mainline 1660.6

[a] Mileposts for the proposed facilities are based on the milepost numbering convention on Transco's existing pipeline systems.

[b] The Pleasant Valley Interconnect M&R Station is about 2 miles off of the mainline. The tap off the mainline for this station is at MP 1586.2.

A number of commentors questioned whether there is demand for the natural gas that would be transported by the Project, and view the relatively low price of natural gas as an indicator of sufficient gas supply. Under Section 7 of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project.

Further, the Commission's Statement of Policy on the Certification of New Interstate Natural Gas Pipeline Facilities (Policy Statement)[5] describes the process and criteria that the Commission uses to evaluate proposed projects and establishes criteria for determining whether there is a need for a proposed project and whether the proposed project will serve the public interest. In summary, the Commission considers the environmental impacts and potential adverse effects of a project on the applicant's existing customers, competing existing pipelines and their customers, and landowners and surrounding communities. The Commission then weighs these impacts against the public benefits of the project. The Policy Statement recognizes that meeting demand may be one public benefit of a project, and that binding precedent agreements constitute significant evidence of demand for a project. While detailed discussion of Transco's proposed Project's need is outside the scope of this EA, we note that the additional gas volumes associated with the Project have been fully contracted by various shippers as indicated in Transco's application. The Commission will more fully consider the need for the Project when making its decision on whether the Project is consistent with public interest.

1.4 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

1.4.1 Federal Energy Regulatory Commission

Based on its authority under the NGA, the FERC is the lead agency for preparation of this EA in compliance with the requirements of NEPA, the Council on Environmental Quality's regulations for implementing NEPA (40 CFR 1500-1508), and FERC regulations implementing NEPA (18 CFR 380).

As the lead federal agency for the Project, the FERC is required to comply with Section 7 of the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act, Section 106 of the National Historic Preservation Act (NHPA), and section 307 of the Coastal Zone Management Act. Each of these statutes has been taken into account in the preparation of this EA. The FERC will use this document to consider the environmental impacts that could result if it authorizes the Project.

The Energy Policy Act of 2005 (EPAct 2005) provides that the FERC shall act as the lead agency for coordinating all applicable authorizations related to jurisdictional natural gas facilities and for purposes of complying with NEPA. The FERC, as the "lead federal agency," is responsible for preparation of this EA. This effort was undertaken with the participation and assistance of the COE and PHMSA as "cooperating agencies" under NEPA. Cooperating

[5] The Policy Statement can be found on our website at http://www.ferc.gov/legal/maj-ord-reg/PL99-3-000.pdf. Clarifying statements can be found by replacing "000" in the website address with "001" and "002."

agencies have jurisdiction by law or special expertise with respect to environmental impacts involved with a proposal. The roles of the COE and PHMSA in the Project review process are described below. The EA provides a basis for coordinated federal decision making in a single document, avoiding duplication among federal agencies in the environmental review processes. In addition to the lead and cooperating agencies, other federal, state, and local agencies may use this EA in approving or issuing permits for all or part of the proposed Project. Federal, state, and local permits, approvals, and consultations for the Project are discussed in section 1.10.

1.4.2 U.S. Army Corps of Engineers Role

The Project crosses areas within the Philadelphia and Baltimore Districts of the COE, with the Philadelphia District being the lead District for the Project.

Wetlands in the Project area are regulated at the federal and state levels. The COE elected to cooperate in preparing this EA because it has jurisdictional authority pursuant to section 404 of the Clean Water Act (CWA) (33 United States Code [USC] 1344), which governs the discharge of dredged or fill material into waters of the United States, and section 10 of the Rivers and Harbors Act (33 USC 403), which regulates any work or structures that potentially affect the navigable capacity of navigable waters of the United States. In New Jersey, the U.S. Environmental Protection Agency (EPA) approved the state's assumption of the federal section 404 permit program from the COE. The COE retains full section 404 and section 10 permitting authority in Pennsylvania. Although this EA addresses environmental impacts associated with the Project as they relate to the COE's jurisdictional permitting authority, it does not serve as a public notice for any COE permits or take the place of the COE's permit review process.

At the request of the COE, the FERC expanded the scope of the EA to discuss a proposed wetland mitigation parcel identified by Transco in Pennsylvania (see section 2.2.4). This was done to assist the COE in its obligation to ensure compliance with Section 7 of the ESA and Section 106 of the NHPA. Therefore, information regarding federal threatened and endangered species and cultural resources reviews and consultations for this parcel are included in sections 2.3.3 and 2.6, respectively.

1.4.3 Pipeline and Hazardous Materials Safety Administration Role

PHMSA is the federal agency responsible for regulating and ensuring the safe and secure movement of natural gas and hazardous liquids by pipeline under 49 USC 60101 et seq. (the pipeline safety laws). PHMSA pipeline safety regulations are published in 49 CFR Parts 190 to 199. PHMSA carries out these responsibilities through its Office of Pipeline Safety. The Office of Pipeline Safety's authority is found under the Natural Gas Pipeline Safety Act of 1968 (49 USC 1671 et seq.) and the Hazardous Liquids Pipeline Safety Act of 1979 (49 USC 2001 et seq.).

1.5 PUBLIC REVIEW AND COMMENT

On January 14, 2013, Transco filed a request to utilize our pre-filing process, which we approved on January 29, 2013, in Docket No. PF13-5-000. We participated in four public open houses sponsored by Transco in the Project area in April 2013 to explain our environmental review process to interested stakeholders. On May 24, 2013, we issued a *Notice of Intent to*

Prepare an Environmental Assessment for the Planned Leidy Southeast Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings (NOI). The NOI was published in the Federal Register[6] and was sent to approximately 1,200 parties including federal, state, and local officials; agency representatives; conservation organizations; local libraries and newspapers; Native American Tribes; and property owners affected by the proposed facilities.

We conducted two public scoping meetings in the Project area to provide an opportunity for agencies and the general public to learn more about the Project and to identify issues to be addressed in the EA. Meetings were held on June 12 and 13, 2013, in Wilkes-Barre, Pennsylvania, and Hillsborough Township, New Jersey, respectively. The scoping meetings were attended by approximately 95 individuals, 34 of whom provided verbal comments on the Project. The transcripts of the public scoping meetings and all written scoping comments are part of the public record for the Project and are available for viewing on the FERC internet website (http://www.ferc.gov).[7]

During the review process, we also participated in meetings with representatives of the NJDEP; Delaware Riverkeeper Network; the Municipality of Princeton, New Jersey; Readington Township, New Jersey; Branchburg Township, New Jersey; and Montgomery Township, New Jersey. We attended an on-site environmental review of the Princeton Ridge area along the Skillman Loop on July 11, 2013, and viewed the remainder of the Project via automobile and helicopter in conjunction with open houses, public scoping meetings, and other meetings. We also held frequent teleconferences with interested state and federal permitting agencies which periodically included the COE, PHMSA, EPA, NJDEP, Pennsylvania Department of Environmental Protection (PADEP), and Delaware River Basin Commission.

We received 151 written comment letters during the formal scoping period and throughout preparation of the EA. Written comments were received from 3 federal agencies (the New Jersey and Pennsylvania Field Offices of the U.S. Fish and Wildlife Service (FWS) and the COE); 5 state agencies (the NJDEP, New Jersey State Agriculture Development Committee, New Jersey Historic Preservation Office, Pennsylvania Historical and Museum Commission, and Virginia Department of Environmental Quality (VDEQ); 8 local government bodies; 1 U.S. Senator from New Jersey (Senator Robert Menendez); 1 U.S. Congressman from New Jersey (Representative Rush Holt); 10 non-governmental organizations (Delaware Riverkeeper Network; Sierra Club; Sourland Planning Council; Princeton Shade Tree Commission; Princeton Ridge Coalition; The Stony Brook-Millstone Watershed Association; Montgomery Friends of Open Space; and Friends of Princeton Open Space); and approximately 120 affected landowners and individuals.

Table 1.5-1 summarizes the environmental issues identified during the scoping process. Substantive environmental issues raised by commentors are addressed in applicable sections of the EA.

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[6] 78 Fed. Reg. 33,403 (2013).

[7] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., PF13-5 and CP13-551). Select an appropriate date range.

TABLE 1.5-1

Issues Identified in Comments Received During the Public and Agency Scoping Process

Issue/Summary of Comment	EA Section Addressing Comment
GENERAL/PROJECT DESCRIPTION	
Project purpose and need	1.3
Project requires Environmental Impact Statement	1.5
Project encourages shale gas development and hydraulic fracturing	1.5, 2.10.3
Minimize construction right-of-way to reduce impacts	1.6.6
GEOLOGY AND SOILS	
Geology and soils of Princeton Ridge pose construction and operational safety concerns	1.6.2, 2.1.1,
Soil compaction	2.1.2
WATER RESOURCES, FISHERIES, AND WETLANDS	
Water and wetland resources of Princeton Ridge	2.2
Impacts on groundwater resources and wells	2.2.1
Impacts on sensitive surface waters	2.2.2
Wetland impacts and restoration	2.2.4
Consider construction alternatives to reduce impacts on surface waters and wetlands	2.2.2, 2.2.4
VEGETATION	
Sensitivity and loss of habitat in Princeton Ridge	2.3.1,
Loss of forest; fragmentation	2.3.2
Right-of-way restoration concerns	2.3.1, 1.6.2
Invasive species concerns	2.3.1
WILDLIFE AND THREATENED AND ENDANGERED SPECIES	
Wildlife resources of Princeton Ridge	2.3.2
Impacts on wildlife habitat	2.3.2
Impacts on migratory birds	2.3.2, 2.3.3
Impacts on federal and state special status species	2.3.3
LAND USE, VISUAL RESOURCES, AND RECREATION	
Impacts on Princeton Ridge, including residences and schools	2.4, 2.4.5
Preclusion of future property development	2.4.4
Project location near populated areas, residences	2.4.4
Impacts on Green Acres Program properties	2.4.5
Impacts on agricultural land and horse ranches	2.4.2
SOCIOECONOMICS	
Impacts on local traffic from construction traffic	2.5.3
Project will provide limited benefit to local communities and counties	2.5
Impacts on property values, ability to sell property	2.5.4
CULTURAL RESOURCES	
Impacts on culturally significant and historic areas	2.6.4
AIR QUALITY AND NOISE	
Greenhouse gas emissions must be assessed	2.7.3
Air impacts from construction equipment	2.7.3
Noise from machinery and construction activities	2.8.1
Noise from compressor station operations	2.8.2
RELIABILITY AND SAFETY	
Potential to damage existing pipelines during construction, including on Princeton Ridge	2.9.1
Construction and operational safety in residential areas	2.9.1
Emergency planning and response	2.9.1
Transco's safety history	2.9.2
ALTERNATIVES	
Consider No Action and System Alternatives	3.0
Consider replacement of existing pipeline with larger diameter pipe	3.3.2
Alternatives to avoid/reduce impacts on residential areas	3.4
Alternatives to avoid Princeton Ridge	3.4

We received comments during the scoping period recommending that an Environmental Impact Statement (EIS), rather than an EA, be prepared to assess the impacts of the Project. An EA is a concise public document for which a federal agency is responsible that serves to provide sufficient evidence and analysis for determining a finding of no significant impact. Pursuant to 18 CFR 306(b) "If the Commission believes that a proposed action…may not be a major federal action significantly affecting the quality of the human environment, an EA, rather than an EIS, will be prepared first. Depending on the outcome of the EA, an EIS may or may not be prepared." In preparing this EA, we are fulfilling our obligation under NEPA to consider and disclose the environmental impacts of the Project. This EA addresses the impacts that could occur on a wide range of resources should the Project be approved and constructed. Based on our analysis and considering that the Project would involve pipeline looping and modifications to existing facilities, we conclude that the impacts associated with this Project can be sufficiently mitigated to support a finding of no significant impact and, thus, an EA is warranted.

We also received comments urging the Commission to deny the Project on the grounds that it would transport or further encourage the development of natural gas obtained by hydraulic fracturing (fracking), a process that some view as environmentally unacceptable. Other commentors recommended that impacts associated with fracking be included in the environmental review of the Project. Our authority under the NGA and NEPA review requirements relate only to natural gas facilities that are involved in interstate commerce. Thus, the facilities associated with the production of natural gas are not under FERC jurisdiction. The development of the shale gas reserves, which is regulated by the states, continues to drive the need for takeaway interstate pipeline capacity to allow the gas to reach markets. Therefore, companies are planning and building interstate transmission facilities in response to this new source of gas supply. In addition, many production facilities have already been permitted and/or constructed in the region, creating a network through which natural gas may flow along various pathways to local users or the interstate pipeline system, including Transco's existing system. That is not to say that the environmental impact of individual production facilities is not assessed. In Pennsylvania, the permitting of oil and gas production facilities is under the jurisdiction of the PADEP and other agencies, such as the COE or the Delaware River Basin Commission. Natural gas is not produced in New Jersey.

Some commentors believe that the Project would promote the export of domestically produced natural gas and, therefore, the environmental and economic effects of natural gas export should be considered in the EA. The environmental impacts that may be associated with the local distribution and/or end use of natural gas transported by interstate transmission projects are generally beyond the scope of the Commission's review. We note, however, that the Project would deliver natural gas to Transco customers, including utility companies, in Mid-Atlantic and Southeastern states. In addition, the siting of facilities specifically designed to export domestically produced natural gas would be subject to environmental review by the Commission in conjunction with the U.S. Department of Energy and other state and federal regulatory agencies.

Commentors also contend that operators of interstate natural gas transmission systems in the Project area, including Transco, intentionally segment larger projects into smaller projects to reduce the level of environmental scrutiny. The Commission requires that applicants design projects that are sized to transport the capacity of natural gas for which there is demonstrated

market support, i.e., applicants cannot overbuild infrastructure in anticipation of future market support. Should an applicant develop another FERC-regulated project in the same region in response to market conditions, the new project would be subject to environmental review by the Commission. Whereas the scope of this EA is focused on the environmental impacts of the Project as proposed by Transco, we consider in section 2.10 the cumulative impact that other projects in the region, including other FERC jurisdictional projects, may have in conjunction with the Project.

1.6 CONSTRUCTION PROCEDURES

The Project would be designed, constructed, operated, and maintained to conform to, or exceed, the requirements of the DOT in 49 CFR 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*. Transco would also construct, restore, and maintain the Project according to the measures described in its Spill Prevention, Control, and Countermeasures Plan (SPCC Plan), and our *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), which were developed to minimize the environmental impact of construction and operation of interstate natural gas transmission facilities. Transco would implement the measures described in our Plan and Procedures, but proposed several site-specific modifications to the Procedures (see table 1.6-1). Transco's modified, Project-specific Plan and Procedures are hereinafter referred to as Transco's Plan and Transco's Procedures.

If approved by the Commission, Transco proposes to construct the Project between October 2014 and December 2015. Construction of the pipeline loops would occur between April and November 2015, although the majority of work in any one area would typically be completed in 6 to 8 weeks. Transco would put the Project into service in December 2015.

1.6.1 General Pipeline Construction Sequence

Standard pipeline construction consists of specific activities that make up a linear construction sequence. Figure 1.6.1-1 depicts the typical sequence of cross-country pipeline construction. Transco would notify affected landowners prior to initiating preconstruction surveys. A crew would then survey the route and stake the proposed pipeline loop centerlines, foreign pipeline and utility crossings, and workspace limits, along with wetland boundaries and other environmentally sensitive areas. Temporary soil erosion and sedimentation controls would be installed in accordance with Transco's Plan and Procedures and its county-specific Erosion and Sediment Control Plans (E&SCPs), and maintained throughout construction. Clearing crews would then cut vegetation and either chip it for use as mulch on upland areas of the right-of-way or dispose of it in accordance with landowner requirements and local regulations. Burning may be conducted if permitted. Large trees would be removed from the approved workspace only if necessary. In certain areas, clearing would be conducted within specified timing windows to avoid or minimize impacts on special status species habitat. After clearing, the right-of-way would be graded to create a generally level and safe work surface.

TABLE 1.6-1

Proposed Modifications to the FERC's Procedures

Section	Proposed Modification	Discussion	FERC Acceptance Status
V.B.2.a and VI.B.1.a	Transco proposes to modify the requirement that additional temporary workspace (ATWS) be located at least 50 feet from a waterbody or wetland. Transco would locate ATWS within 50 feet of specific waterbodies and wetlands where necessary due to site-specific conditions.	Appendices H and J identify the locations where Transco would utilize ATWS within 50 feet of a waterbody and wetland, respectively, and provides site-specific justification for each location. At these locations, Transco would provide secondary containment for all overnight equipment, pump, and refueling activities, and would implement its SPCC Plan, which requires equipment spill kits to be maintained on site. Transco would also use diversion terraces and sediment barriers extending the entire width of the construction right-of-way (including ATWS) to protect waterbodies and wetlands.	Accepted
V.B.3.c	Transco proposes to modify the requirement to maintain at least 15 feet of undisturbed vegetation between a waterbody and pipeline where the pipeline parallels the waterbody. Transco would implement the modification at the following locations: Skillman Loop • SS-002-014, unnamed tributary to Rock Brook • SS-002-021, unnamed tributary to Pike Run Pleasant Run Loop • SS-002-025, unnamed tributary to Pleasant Run • SS-002-037, unnamed tributary to Pleasant Run • SS-002-042, unnamed tributary to Pleasant Run crossing no. 1 at MP 5.4 Franklin Loop • SS-001-011, unnamed tributary to Little Tunkhannock Creek • SS-001-014A, unnamed tributary to Little Tunkhannock Creek • SS-001-014B, unnamed tributary to Little Tunkhannock Creek • SS-001-021, Two Mile Run • SS-001-028, unnamed tributary to Kendall Creek • SS-001-029, Kendall Creek crossing no. 2 at MP 67.4 Dorrance Loop • SS-001-004, unnamed tributary to Little Wapwallopen Creek	The topography and adjacent wetlands prevent relocation of the loops. The proposed pipeline loops have been located at the narrowest possible location associated with the streams without interfering with existing pipelines or requiring additional permanent right of way. Following construction, Transco would restore each stream to its initial configuration to the extent possible. The pipeline loops would be encased in concrete and placed sufficiently below the streams so as not to interfere with stream flow.	Accepted
V.B.4.a	Transco proposes to modify the requirement to place all spoil from minor and intermediate waterbody crossings in the construction right-of-way at least 10 feet from the water's edge, or in ATWS. Transco would store spoil within 10 feet of waterbodies where the workspace is limited due to topographic constraints and adjacent features.	Transco would install sediment barriers to prevent the spoil from entering the waterbody. In addition, diversion terraces and sediment barriers used to protect waterbodies and wetlands would extend the entire width of the construction right-of-way, to include the ATWS.	Not Accepted Recommended condition in section 2.2.2
VI.A.3	Transco proposes to modify the requirement to limit the width of the construction right-of-way in wetlands to 75 feet. Transco would utilize a construction right-of-way greater than 75 feet wide in certain wetlands due to site-specific conditions.	Table 2.2.4-2 identifies the locations where Transco would utilize a construction right-of-way greater than 75 feet wide in wetlands, and provides acceptable site-specific justification for each proposed location.	Accepted

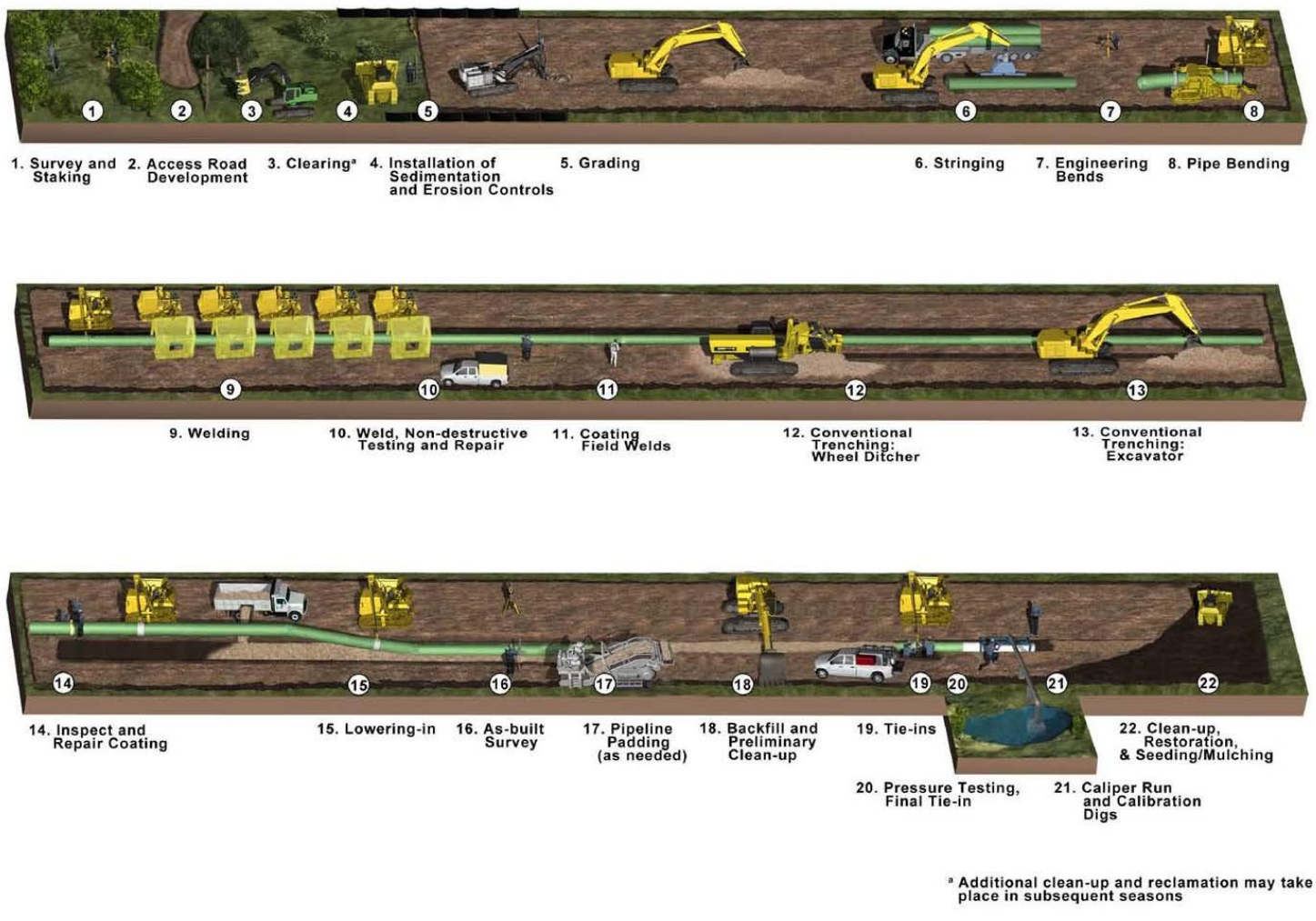


Figure 1.6.1-1
Leidy Southeast Expansion Project
Typical Pipeline Construction Sequence

The trench for installation of the pipeline loops would be excavated by track-mounted backhoes or similar equipment. Spoil from the trench would typically be stored on the opposite side of the trench from the construction equipment, or in approved additional temporary workspace (ATWS). The trench would be excavated to provide a minimum of 3 feet of cover over the pipe after backfilling; however, the pipeline could be installed with less than 3 feet of cover in areas of shallow bedrock in accordance with DOT regulations. In agricultural and residential areas, up to 12 inches of topsoil would be removed and stored separately from the subsoil. Water trucks would be used as necessary to control dust along the construction travel lane.

After trench excavation, pipe sections would be delivered to the right-of-way and placed on skids adjacent to the trench. Professional welders, qualified according to applicable industry standards and Transco requirements, would weld the pipe sections together, and certified inspectors would utilize visual and non-destructive methods to test the integrity of the welds according to industry protocol. Previously uncoated pipe ends would be field coated with an industry-approved anti-corrosion coating; inspectors would check the entire pipe for defects in the coating and make repairs as needed. The trench would be cleaned of any debris and side booms would be used to lower the pipeline into the trench.

After the pipe is positioned in the trench, crews would backfill the trench with the previously excavated material. Where topsoil is stored separately from subsoil, the crews would backfill the subsoil first and then replace the topsoil over the subsoil. In residential and agricultural areas, compacted subsoil would be disked[8] prior to topsoil replacement. Surplus construction material and debris would be removed and disposed of at appropriate disposal sites, and all work areas would be graded to match surrounding contours. Following backfilling and before being placed into service, the new pipeline segments would be hydrostatically tested to ensure that they are capable of operating safely at the design pressure. Hydrostatic testing would be conducted in accordance with applicable permits, and no chemicals would be added to the test water. Finally, crews would install permanent erosion controls within the right-of-way, if necessary, and initiate revegetation measures in accordance with Transco's Plan and Procedures and other permit requirements.

1.6.2 Special Construction Procedures

In addition to the standard pipeline construction methods described above, Transco would implement special construction procedures due to site-specific conditions and to reduce overall Project impacts.

Wetlands

Construction of the Project would impact 37 wetlands in New Jersey and 51 wetlands in Pennsylvania. Wetland crossings would be accomplished in accordance with Transco's Procedures (with the modifications listed in table 1.6-1) and E&SCPs, which are designed to minimize wetland impacts and facilitate wetland restoration, and in accordance with other applicable federal and state permit requirements. In general, Transco would implement

[8] Disking the subsoil typically involves the use of tractors equipped with steel disk blades, or similar equipment, to loosen soils that have been compacted by construction activities.

construction procedures similar to those used in upland areas to cross wetlands found to be unsaturated at the time of construction, including segregating and replacing topsoil. In wetlands with saturated soil or standing water at the time of construction, Transco would utilize timber mats or other temporary surface material adjacent to the trench to provide a stable work area and may string and assemble the pipeline crossing segment in an upland workspace to minimize construction time within the wetland. Topsoil segregation would not be conducted in wetlands with saturated soil or standing water.

Figures depicting the proposed wetland crossing methods are included in Transco's E&SCPs. Transco's alignment sheets also depict the delineated extent of wetlands that would be affected by the loops and the workspace that Transco has requested at each wetland crossing. Additional information regarding wetlands affected by the Project and wetland crossing procedures is discussed in section 2.2.4.

Waterbodies

Construction of the Project would cross 49 waterbodies in New Jersey and 38 waterbodies in Pennsylvania. The waterbody crossings would be constructed in accordance with the methods and timing restrictions described in Transco's Procedures (with the modifications listed in table 1.6-1) and E&SCPs, and state and federal permit requirements. Transco would use one of the following methods to cross each waterbody:

- standard upland construction techniques would be used at ephemeral and intermittent waterbodies that are less than 10 feet wide or are without flow at the time of construction;

- dry crossing methods, which would utilize either a flume or a dam and pump system to temporarily divert water around the crossing location, would be used at certain perennial streams and ephemeral and intermittent streams with flow at the time of crossing;

- HDD, which is a trenchless crossing method used to avoid direct impacts on sensitive resources, such as wetlands and waterbodies, by boring well beneath them; and

- wet open cut method to cross Tobyhanna Creek and the Lehigh River at MPs 61.1 and 65.5 of the Franklin Loop, respectively. Section 2.2.2 describes this method further, in addition to alternative crossing methods evaluated for these waterbodies.

Transco would also utilize temporary culvert bridges to provide equipment crossing and vehicle access across waterbodies that would not be directly crossed by the proposed loops.

Additional information regarding waterbodies affected by the Project and waterbody crossing methods is discussed in section 2.2.2.

Horizontal Directional Drill

The HDD method utilizes specialized drilling equipment and work crews to install pipeline segments well below the ground surface, typically to avoid sensitive environmental resources and challenging conventional construction areas. The design and feasibility of an HDD is determined by a number of factors including the length, depth, and curvature (i.e., profile) of the proposed drill; surrounding topography; pipeline diameter; availability and orientation of land on which to assemble the HDD pipeline segment; land use constraints; and geotechnical suitability of the subsurface environment.

The HDD method is initiated by drilling a small-diameter pilot hole along a pre-determined underground path. A reaming tool is then used to enlarge the pilot hole to a diameter slightly greater than the diameter of the pipeline, and a pre-assembled segment of pipeline is then pulled back through the hole. After the pipeline segment is pulled into place, it is hydrostatically tested and welded to the remainder of the pipeline at each end of the HDD. The HDD process includes the use of drilling fluid to lubricate the drill bit, return cuttings to the surface, and maintain the borehole. Transco would use a non-hazardous drilling fluid comprised primarily of water, inert solids, and bentonite, a naturally occurring clay mineral. Drilling fluid can be inadvertently released outside of the borehole environment and migrate to the land surface, resulting in locally increased turbidity in waterbodies and wetlands, or collecting on the ground surface.

In response to comments from Montgomery Township, Transco proposes two HDDs between MPs 1778.9 and 1780.0 of the Skillman Loop to avoid Beden Brook and its associated wetlands and tributaries, and to reduce impacts on nearby residences and on lands held in conservation easements. The two HDDs would be drilled in opposite directions from a single workspace near MP 1779.3 to minimize the total workspace needed to accomplish the HDDs. Transco has developed a site-specific Horizontal Directional Drill and Contingency Plan (HDD Plan) for the crossing. The HDD Plan includes drawings depicting the HDD profile and temporary work areas, and describes how Transco would monitor for and respond to an inadvertent release of drilling fluid, as required by the COE and NJDEP.

Residential Areas

Transco would implement the construction and restoration measures described in its Plan and detailed on its site-specific Residential Construction Plans (RCPs) (see appendix C) to reduce construction-related impacts in residential areas. In general, Transco would reduce construction workspace, as practicable, to minimize inconvenience to landowners; minimize the clearing of trees; limit workspace to the confines of Transco's existing easement where possible; maintain access for landowners affected during Project construction; and make every effort to ensure that cleanup is thorough. Transco would also take steps to protect drinking water wells (section 2.2.1) and has prepared a Septic System Contingency Plan to avoid or mitigate impacts on private septic systems. Transco also provided a Landowner Complaint Resolution Procedure that outlines the steps that Transco would take to address landowner issues during and after construction. Transco would also utilize the following construction methods to further minimize impacts on residences, which are discussed further below:

- Transco would work over or between existing pipelines at select locations to reduce the construction workspace;
- Transco would utilize crossovers to reduce impacts on residences; and
- Transco would reduce the offset between the existing and proposed pipelines to reduce the construction workspace.

Working Over or Between Active Pipelines

Due to the proximity of some residences to Transco's existing right-of-way, Transco would use the previously cleared and maintained area over its existing pipeline facilities as the working side of the construction right-of-way (i.e., the heavy equipment used to excavate the trench and install the proposed pipeline loops would operate over Transco's existing pipeline(s)). Project alignment sheets and construction cross sections indicate that Transco would work over active pipelines at 19 locations for a total of 3.7 miles (12 percent) of the proposed loop lengths, including two segments along the Franklin Loop where the new pipeline would be installed between existing pipelines to reduce impacts on residences along each side of the existing right-of-way. Transco's internal construction procedures state that, in areas with less than 5 feet of cover over existing pipelines, Transco engineers would calculate and analyze construction-related stresses in the active pipelines and develop measures to keep the calculated stresses within public safety codes and Transco specifications. These measures include additional soil cover, matting, or other means to protect the existing pipelines. As discussed below, Transco would work over 1.3 miles of existing pipeline within the Princeton Ridge area of the Skillman Loop.

Crossovers

Crossovers occur where a new pipeline typically crosses beneath an existing pipeline. Crossovers are not uncommon and are generally implemented to minimize impacts on a localized resource, such as a residence or a sensitive wetland, or to align the new pipeline with existing pipeline termination points. Crossovers require deeper excavation, greater volume of spoil, additional workspace, and exposure of the crossed pipelines. Crossovers generally result in localized increased land impacts and require extra care during installation. However, they may reduce or avoid impacts on sensitive resources.

Transco would implement crossovers on the Skillman, Pleasant Run, and Franklin Loops to reduce impacts on residences. Transco would develop site-specific plans for the installation of the crossovers and would confirm that potential construction stresses on the existing pipelines would not exceed public safety codes or Transco specifications.

Reduced Offset

PHMSA regulations do not specify a minimum offset between parallel interstate transmission pipelines. However, Transco and other pipeline operators typically separate pipelines by approximately 25 feet to provide sufficient room for the use of standard overland pipeline construction methods and ready access for maintenance operations or in the event of an

emergency. Pipeline operators can reduce the offset between parallel pipelines for short distances to avoid a resource (e.g., a residence, critical habitat, or cultural site) and/or minimize the construction workspace in constricted or sensitive work areas. Depending on site-specific conditions, pipeline operators may implement special construction methods (e.g., drag section) to install the pipeline in reduced offset areas. Excluding areas where the proposed pipeline facilities would be installed between existing pipelines, Transco would reduce the offset between the proposed and existing pipelines for 2.5 miles on the Skillman Loop and to reduce impacts on three residences along the Pleasant Run Loop.

Railroad and Road Crossings

Transco would cross major paved highways where traffic cannot be interrupted using the bore crossing method. Smaller roads with low traffic volume would be crossed by the open-cut method, and then restored to preconstruction condition. The pipeline would conform to DOT standards, typically buried to a depth of at least 5 feet below the road surface, and would be designed to withstand anticipated external loading.

The bore crossing method involves the use of an auger drill to install the pipeline below the ground surface. The bore method requires the excavation of pits on each side of the feature and ATWS to store the spoil from the pits. There is typically a minimum depth of 5 feet below the surface to allow the pipeline to withstand expected external loadings. Depending on permit conditions, the pipe may or may not be cased at road crossings. The bore crossing method allows the roadway to remain in service while the installation process takes place. As a result, there is little or no disruption to traffic at roadway crossings that are crossed by this method.

With the open-cut crossing method, the trench is excavated and the pipe installed using the standard cross-country construction methods described above. Temporary closure of the road to traffic and establishment of detours may be required. If no reasonable detour is feasible, at least one lane of the road being crossed would be kept open to traffic.

Utility Crossings

Transco has identified 137 foreign utilities that cross the proposed pipeline loops. Transco is consulting with utility companies to determine the exact locations of utilities in relation to the pipeline loops and protective measures that would be implemented during construction. Any relocation of utilities would be completed by the utility company having jurisdiction and would be supported financially by Transco, as required.

Blasting

Based on its prior pipeline construction experience in the Project area, Transco does not anticipate that blasting would be necessary for Project construction. However, if bedrock is encountered that requires blasting, Transco provided a Project-specific Blasting Plan that describes how blasting would be conducted and the measures that would be implemented to minimize blasting effects. Blasting would be conducted by licensed personnel and in compliance with applicable federal, state, and local regulations. Affected landowners, nearby businesses, and other nearby parties would be notified in advance of blasting activity. Additional discussion of impacts related to blasting is included in section 2.1.1.

Princeton Ridge, Mercer County, New Jersey

Between MPs 1776.8 and 1778.1, 1.3 miles of the Skillman Loop would cross an area within the Municipality of Princeton and northern Mercer County, New Jersey referred to as the Princeton Ridge. As discussed in section 2.4.5, the 2001 New Jersey State Development and Redevelopment Plan (State Plan) designated this area of the Princeton Ridge as Environmentally Sensitive Area 5 (ESA 5) and Fringe 3 (F3). The State Plan characterizes ESA 5 lands as large, contiguous areas and valuable ecosystems, geologic features, and wildlife habitat where the future of the environmental and economic integrity rests in the protection of these resources. F3 lands are characterized as predominantly rural landscape that are not prime or environmentally sensitive but that can provide a buffer between ESA 5 lands and more developed areas. ESA 5 and F3 areas are specified as areas for conservation and limited growth.

Transco's existing right-of-way crosses or abuts residentially developed land for approximately 1.2 miles (92 percent) of the Princeton Ridge crossing. The residences occur on large lots that include forested areas, wetlands, and streams. Most homes are set back some distance from the right-of-way, although five homes are within 50 feet of the existing right-of-way. Four paved roads also cross the existing right-of-way within the Princeton Ridge.

As discussed in section 2.0, affected landowners, interested citizens, non-government organizations, the Municipality of Princeton, and others provided detailed comments describing the environmental characteristics of the Princeton Ridge and expressing concerns with the Project. These concerns centered on the Project's potential impact on geologic resources, soil, vegetation, wetlands, streams, wildlife, visual resources, and recreational land use. Commentors were also concerned that construction of the Skillman Loop could damage the existing Caldwell Line B and create a public safety issue. Numerous commentors also raised concern that post-construction restoration would be difficult, and some recommended alternative construction methods and route alternatives to avoid the area (section 3.5.1).

Due to the State Plan environmental designation of the Princeton Ridge, Transco prepared a Comprehensive Rock Handling Plan for the Princeton Ridge segment of the Skillman Loop (Rock Handling Plan) and a Construction and Restoration Plan Developed Specifically for New Jersey State Planning Areas: Environmentally Sensitive Area 5 and Fringe 3, Along the Skillman Loop (PRCRP).[9] Transco consulted with Princeton Ridge stakeholders in developing these site-specific plans.

The Rock Handling Plan, PRCRP, and other documentation in the public record, including Transco's June 2, 2014 supplemental filing, describe Transco's field and technical investigations and the special construction techniques and restoration methods that Transco proposes to implement in the Princeton Ridge. In summary:

[9] These plans were filed with FERC on May 6, 2014, and can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the" Docket Number" field (i.e., CP13-551). Be sure to select the appropriate date range. Each plan can be found under Accession No. 20140506-5178. In addition, the Rock Handling Plan, without its appendices, can be found in appendix D of this EA.

- Transco would limit the width of the construction right-of-way to 50 feet for the majority of the 1.3-mile-long segment. ATWS would be necessary at the tie-in to Transco's Mainline system at MP 1776.8 and at localized areas along the segment.

- This reduced construction right-of-way would require Transco to work over the existing pipeline. Modeling was performed utilizing the site-specific data to estimate the stress that could be imposed on the existing pipeline during construction. As an added safety factor, the modeling assumed 2 times the weight of the heaviest piece of equipment expected to be used during construction.

- Prior to construction, Transco would utilize an inline tool to inspect the existing pipeline. Any anomalies would be addressed before construction of the Skillman Loop commences.

- Transco would discontinue the flow of natural gas in the existing pipeline during the use of the rock hammering technique in trenching for the new pipeline, estimated to last about 3 to 6 weeks. During this time, the pipeline segment would be filled with water and pressurized to between 100 and 800 pounds per square inch (psi).

- Upon completion of rock removal activities, the existing pipeline would be hydrostatically tested for 8 hours up to 1,200 psi, or 1.5 times the Maximum Allowable Operating Pressure (MAOP) of 800 psi.

- Transco undertook geophysical and geotechnical field investigations to identify the depth to bedrock and large boulders in the substrate and to determine soil characteristics in the construction right-of-way.

- Transco would remove large rocks from over the pipeline and ensure a minimum of 3 feet of cover. A wooden mat bridge would then be installed over the pipeline, creating an airspace between the ground surface and construction equipment. Transco would monitor the matting to ensure that the airspace is maintained above the pipeline during work over activities. In section 2.9.1, we recommend that Transco provide a written plan detailing the specific measures that would be implemented to monitor for and maintain the proposed air gap over the existing pipeline.

- Transco would utilize non-blasting techniques to remove large boulders and excavate bedrock from the new trench. Rock hammer equipment, if necessary, would be stationed only over the trench, and not over the existing pipeline.

- After successful hydrostatic testing and returning the existing pipeline to service, Transco would perform another inline inspection of the existing pipeline with a geometry inspection tool.

- Upon completion of construction, the Skillman Loop would be hydrostatically tested to ensure the integrity of the new pipeline prior to placement in service.

- Transco would perform pot-holing to verify the location of the existing pipeline in order to ensure that the air-gap is centered over the existing pipeline.

- Transco would implement site-specific restoration measures in the Princeton Ridge including, but not limited to the testing for and treatment of compacted soils; topsoil replacement; planting of seed mixtures in consultation with the NJDEP, Mercer County, and Natural Resource Conservation Service (NRCS); planting of native herbaceous and woody plants and shrubs; replacement of boulders and rocks across the land surface; restoration of stream beds and banks; the placement of permanent erosion control devices, if necessary; implementation of its site-specific Noxious and Invasive Weed Control Plan; and monitoring to ensure successful revegetation.

We conclude that the reduced construction right-of-way and implementation of the measures in Rock Handling Plan, PRCRP, Transco's Plan and Procedures, and our recommendation in section 2.9.1, would minimize environmental impacts, protect public safety, and provide for restoration of the right-of-way through the Princeton Ridge area. Our analysis of the Project's environmental impacts, including those on the Princeton Ridge, is discussed in detail throughout this EA.

1.6.3 Additional Temporary Workspaces, Contractor/Pipe Storage Yards, Contractor Staging Areas, and Access Roads

Transco would require the use of ATWS along the pipeline rights-of-way for various road, wetland, and waterbody crossings; in conjunction with construction of new and modified aboveground facilities; and for specialized construction technique areas (e.g., steep side slopes). A list of ATWS associated with the Project is included in appendix E. In addition, 17 areas are proposed for use as contractor/pipe storage yards and contractor staging areas (section 1.2.3). In general, ATWS and contractor/pipe yards would be cleared and graded for use during construction as described in section 1.6.1.

As noted in section 1.2.3, Transco would modify 16 private roads for access during construction and/or operation of the Project and would construct 5 new roads for access to the construction workspace, 2 of which would be retained for permanent access to MLV sites. Modification and construction of access roads would involve trimming or removal of vegetation, grading, and placement of gravel surfacing. Roads only used for construction would be restored to previous conditions or in accordance with landowner agreements.

The environmental impacts associated with the use of ATWS, contractor/pipe yards, and access roads, and the measures that Transco would implement to minimize impacts, are discussed in appropriate sections of this EA.

1.6.4 Aboveground Facilities

Construction and modifications of aboveground facilities would typically include clearing, grading, compacting the site where necessary, pouring concrete foundations, and the erection/installation of aboveground equipment, buildings, and piping. Limited direct ground disturbance (e.g., grading and excavation) would be needed to complete the facility modifications.

Compressor Stations

All compressor station construction would take place at existing facilities on property owned by Transco. No new property would be acquired for construction or operation of the proposed compressor station modifications. The majority of work would occur in previously disturbed and developed areas of the sites; land use requirements and environmental impacts associated with modification of existing compressor stations are presented in section 2.0.

Mainline Valves and Launchers/Receivers and Other Aboveground Facilities

The proposed work at MLV, pig launcher/receiver, and other aboveground facility sites would involve the modifications as described in tables 1.2.2-2 and 1.2.2-3. The sites of pig launcher/receiver facilities that are removed would be restored to pre-existing conditions.

1.7 ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING

In preparing construction drawings and specifications for the Project, Transco would incorporate all mitigation measures identified in its permit applications, as well as additional requirements of federal, state, and local agencies. Transco would provide the construction contractors with copies of applicable environmental permits, as well as copies of "approved for construction" environmental construction alignment sheets and construction drawings and specifications. Transco would be required to have copies of the permits issued by the COE at each COE jurisdictional wetland and waterbody crossing.

Transco would conduct training for its construction personnel, including Environmental Inspectors (EIs), contractors, and their employees, regarding proper field implementation of its E&SCPs, SPCC Plan, and other Project-specific plans and mitigation measures. The training would cover Project environmental documents and all Project-specific conditions contained in the Commission Order and other applicable federal, state, and local permits and approvals.

Transco would be represented by a Chief Inspector, who would be responsible for quality assurance and compliance with mitigation measures, other applicable regulatory requirements, and company specifications. The Chief Inspector would be assisted by at least one full-time Craft Inspector and EI(s). The EIs would have authority to stop activities that violate the measures set forth in the Project documents and authorizations and would have the authority to order corrective action. Transco's Plan identifies additional responsibilities of the EI. We would also conduct routine inspections during construction to determine compliance with any conditions attached to an Order and to inspect the construction conditions of the Project facilities.

After construction, Transco would conduct follow-up inspections of all disturbed upland areas to determine the success of restoration and would monitor the success of wetland revegetation annually for the first 3 years (or as required by permit) after construction, or longer, until wetland revegetation is successful. At a minimum, inspections would occur after the first and second growing seasons in upland areas to ensure the restoration of all areas affected by the Project, we would also continue to conduct oversight inspection and monitoring following construction. If it is determined that any of the proposed monitoring timeframes are not adequate to assess the success of restoration, Transco would be required to extend its post-construction monitoring programs.

1.8 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

Operational activities on the pipeline would be limited to maintenance of the right-of-way and inspection, repair, and cleaning of the pipeline. Periodic aerial and ground inspections by pipeline personnel would assist in identification of the following conditions: soil erosion that may expose the pipe, surface visual clues that may indicate a leak in the line, conditions of the vegetation cover and erosion control measures, unauthorized encroachment on the right-of-way, excavation activities in the vicinity of the right-of-way, and other conditions that could present a safety hazard or require preventative maintenance or repairs. The pipeline cathodic protection system also would be monitored and inspected by pipeline personnel periodically to ensure proper and adequate corrosion protection. Appropriate corrective action to conditions observed during inspection would be taken as necessary.

To maintain accessibility of the right-of-way and to accommodate pipeline integrity surveys, vegetation on the new permanent right-of-way would be maintained by mowing, cutting, and trimming in all areas except for active agricultural areas and wetlands. The right-of-way would be allowed to revegetate; however, large brush and trees would be periodically removed as described in Transco's Project-specific Plan and Procedures. Trees or deep-rooted shrubs could damage the pipeline's protective coating, obscure periodic surveillance and inspection, or interfere with potential repairs and thus would not be allowed to grow near the pipeline. In particular, large tree growth would typically be restricted within 25 feet of either side of the pipeline in uplands. The pipeline facilities would be clearly marked at line-of-sight intervals and at crossings of roads, railroads, and other key points. The markers would clearly indicate the presence of the pipeline and provide a telephone number and address where a company representative can be reached in the event of an emergency or prior to any third-party excavation in the area of the pipeline. Transco would participate in all One-Call systems.

Transco's safety controls are detailed in section 2.9.1 but include monitoring portions of its pipeline system using a supervisory control and data acquisition system. This system gathers information related to system pressures, flows, and customer deliveries 24 hours per day, 365 days per year and transfers the information to Transco's Gas Control Center located in Houston, Texas for the facilities to be installed. The new pipeline would also be connected to Transco's existing cathodic protection system to prevent corrosion. Transco personnel would check the voltage and amperage every 2 months as well as the pipe-to-soil potentials and rectifiers.

Transco states that no new, permanent employees would be needed for operation of the Project. Existing compressor station crews would operate and maintain the compressor station equipment and perform routine checks of the facilities, including calibration of equipment and

instrumentation, inspection of critical components, and scheduled and routine maintenance of equipment. Safety equipment, such as pressure relief, fire detection, and gas detection systems, would be tested periodically for proper operation. Transco would take corrective action for any identified problem.

1.9 LAND REQUIREMENTS

Construction of the Project would impact a total of approximately 796.6 acres of land, including pipeline construction rights-of-way, ATWS, aboveground facility sites, access roads, and contractor/pipe storage yards and contractor staging areas. Following construction, Transco would allow about 712.7 acres (89 percent) of the affected land to revert to previous conditions. Transco would retain the remaining 84.0 acres (11 percent) of land for aboveground facilities and maintained pipeline rights-of-way. Table 1.9-1 identifies the land requirements for each Project facility.

TABLE 1.9-1

Summary of Land Requirements

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Loops [a]		
Skillman Loop	53.9	16.6
Pleasant Run Loop	87.0	17.1
Franklin Loop	141.4	36.0
Dorrance Loop	67.4	9.9
Pipeline Loop Subtotal	**349.7**	**79.6**
Additional Temporary Workspace	64.2	0.0
Aboveground Facilities [b]	290.0	1.3
Access Roads	7.3	3.1
Contractor/Pipe Storage Yards and Contractor Staging Areas	85.5	0.0
PROJECT TOTAL	**796.6**	**84.0**

[a] For construction, assumes a 105-foot-wide temporary right-of-way in upland areas, which includes 50 feet of existing permanent right-of-way and 55 feet of temporary construction workspace, and a 75-foot-wide construction right-of-way in wetland areas. For operation, assumes a 20-foot-wide area at most locations.

[b] Includes modifications to existing compressor stations, mainline valves, and M&R Stations. No permanent or operational impacts would result from modifications at existing mainline valves or M&R Stations listed in table 1.2.2-3.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Construction of the pipeline loops would typically require a 105-foot-wide construction right-of-way in upland areas, except as noted in section 1.6.2. In wetlands, Transco would reduce the construction right-of-way to 75 feet with limited exceptions due to site specific conditions (see table 2.2.4-2). Transco provided drawings depicting typical pipeline construction cross sections with its application materials (see appendix F).

Following construction, the permanent right-of-way of the new pipeline facilities would be 50 feet wide. However, because the proposed Project involves looping of existing pipeline facilities, Transco would not need to acquire a full 50 feet of new permanent easement at most locations because the 50-foot-wide permanent easement would overlap with Transco's existing permanent easement.

Modifications at the compressor stations would require additional land outside the existing fence lines of the facilities, but within the properties owned by Transco. Operation of

the modified compressor stations would require minimal amounts of additional land. In addition, the proposed modifications at MLVs and pig launcher/receivers would occur within Transco's right-of-way and would result in minimal operational impacts.

Proposed contractor/pipe storage yards and contractor staging areas would be used on a temporary basis during Project construction and would be restored to pre-existing condition after construction, with no permanent impact.

Although Transco has identified areas where extra workspace would be required, additional or alternative areas could be identified in the future due to changes in site-specific construction requirements. Transco would be required to file information on each of those areas for review and approval prior to use.

1.10 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

Table 1.10-1 identifies the major federal, state, and local environmental permits, approvals, and regulatory clearances for the Project.

TABLE 1.10-1

Major Environmental Permits, Licenses, Approvals, and Consultations for the Project

Agency	Permit/Approval/Clearance	Submittal Date *(Anticipated)*	Receipt Date *(Anticipated)*
FEDERAL			
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity	September 2013	*September 2014*
U.S. Department of the Army Corps of Engineers			
Baltimore District	Clean Water Act (CWA) Section 404 permit (Dorrance Loop and a portion of the Franklin Loop)	September 2013	*September 2014*
	CWA Section 404 permit (other aboveground facilities)	January 2014	*August 2014*
Philadelphia District	CWA Section 404 permit (a portion of the Franklin Loop)	September 2013	*September 2014*
U.S. Fish and Wildlife Service; New Jersey and Pennsylvania Field Offices	Endangered Species Act (ESA) Section 7 consultation	Ongoing	*September 2014*
	Fish and Wildlife Coordination Act consultation		
	Migratory Bird Treaty Act consultation		
North Carolina Field Office	ESA Section 7 consultation	December 2013	Blanket Authorization
Virginia Field Office	ESA Section 7 consultation	January 2014	June 2014
Maryland Field Office	ESA Section 7 consultation	Ongoing	Awaiting New Blanket Authorization
U.S. Environmental Protection Agency Regions 2 and 3	CWA Section 401, Water Quality Certification (WQC) review	In conjunction with state permit applications (see below)	*September 2014*
	CWA Section 402, National Pollutant Discharge Elimination System (NPDES) review		
	CWA Section 404 review		
	CWA Stormwater Discharge Permit review		

TABLE 1.10-1

Major Environmental Permits, Licenses, Approvals, and Consultations for the Project

Agency	Permit/Approval/Clearance	Submittal Date *(Anticipated)*	Receipt Date *(Anticipated)*
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service			
North Carolina	Coastal Zone Management Act	September 2013	October 2013
Virginia	Coastal Zone Management Act	January 2014	*August 2014*
Maryland	Coastal Zone Management Act	January 2014	*August 2014*
Advisory Council on Historic Preservation	Opportunity to comment under Section 106 National Historic Preservation Act (NHPA)		
NEW JERSEY			
New Jersey Department of Environmental Protection (NJDEP), Land Use Regulation Program	Individual Freshwater Wetlands Permit, Special Activity Transition Area Waiver, and Individual Flood Hazard Area Permit	June 2014	*November 2014*
	Section 401 WQC, Individual Flood Hazard Permit	June 2014	*November 2014*
	Letter of Interpretation (Pleasant Run Loop)	July 2013	June 2014
	Letter of Interpretation (Skillman Loop)	July 2013	*September 2014*
NJDEP, Endangered and Nongame Species Program	Consultation	Ongoing	*September 2014*
NJDEP, Natural Heritage Program (Rare and Endangered Plant Species)	Consultation	Ongoing	*September 2014*
NJDEP, Division of Water Quality	New Jersey Pollutant Discharge Elimination System (NJPDES) General Permit for Dewatering	January 2014	*September 2014*
	NJPDES General Permit for Hydrostatic Test Water Discharge	January 2014	*September 2014*
NJDEP, Division of Air Resources	General Operating Permit	September 2013	*September 2014*
NJDEP, Bureau of Pre-Construction Permits	Pre-construction Permit and Operating Certificate	September 2013	*September 2014*
NJDEP, Green Acres Program	Green Acres Diversion Approval	June 2014	*November 2014*
NJDEP, Historic Preservation Office	Consultation under Section 106 of the NHPA	Ongoing	*August 2014*
New Jersey Department of Transportation	Highway Occupancy Permit	April 2014	*August 2014*
PENNSYLVANIA			
Pennsylvania Department of Environmental Protection (PADEP), Bureau of Watershed Management, Northeast Region	Chapter 105 Water Obstruction and Encroachment Permit and CWA Section 401 WQC	September 2013	*September 2014*
	Submerged Lands License Agreement	January 2014	*September 2014*
PADEP, Bureau of Water Quality Protection	NPDES – PAG 2; Construction Stormwater Discharges	January 2014	*September 2014*
	NPDES – PAG-10; Hydrostatic Testing of Tanks and Pipelines	January 2014	*September 2014*
PADEP, Bureau of Air Quality	Air Quality Plan Approval	September 2013	*September 2014*
Pennsylvania Department of Conservation and Recreation	Consultation		Clearance received December 2013
Pennsylvania Fish and Boat Commission	Consultation		Clearance received November 2013
Pennsylvania Game Commission	Consultation	Ongoing	*August 2014*

TABLE 1.10-1

Major Environmental Permits, Licenses, Approvals, and Consultations for the Project

Agency	Permit/Approval/Clearance	Submittal Date *(Anticipated)*	Receipt Date *(Anticipated)*
Pennsylvania Historical and Museum Commission	Consultation under Section 106 of the NHPA	Ongoing	*August 2014*
Pennsylvania Department of Transportation	Highway Occupancy Permit	April 2014	*August 2014*
LOCAL			
Soil Conservation Districts			
Mercer, Somerset, and Hunterdon Counties, New Jersey	Soil Erosion and Sediment Control Plan Certifications	January 2014	*August 2014*
Monroe and Luzerne Counties, Pennsylvania	Soil Erosion and Sediment Control Plan Certifications	January 2014	*August 2014*
Delaware River Basin Commission	Hydrostatic Test Water Withdrawal and Discharge Permit	May 2014	*August 2014*

2.0 ENVIRONMENTAL ANALYSIS

The environmental consequence of constructing and operating the Leidy Southeast Expansion Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. A temporary impact would generally occur during construction, with the resource returning to preconstruction conditions almost immediately afterward. A short-term impact could continue for up to 3 years following construction. An impact was considered long-term if the resource would require more than 3 years to recover. A permanent impact could occur as a result of an activity that modifies a resource to the extent that it would not return to preconstruction conditions during the life of the Project. We considered as a threshold of significance, if an impact would result in a substantial beneficial or adverse change in the physical environment and the relationship of people with the environment.

In this section, we discuss the affected environment, general construction and operational impacts, and proposed mitigation measures for each resource. Transco, as part of its proposal, agreed to implement certain measures to reduce impacts on environmental resources. We evaluated the proposed mitigation measures to determine whether additional measures would be necessary to further reduce impacts. Where we identified the need for additional mitigation, the measures appear as bulleted, boldfaced paragraphs in the text. We will recommend that these measures be included as specific conditions to authorizations that the Commission may issue to Transco. Conclusions in this EA are based on our analysis of the environmental impact and the following assumptions:

- Transco would comply with all applicable federal laws and regulations;
- the proposed facilities would be constructed as described in section 1.0 of this document; and
- Transco would implement the mitigation measures included in its application and in supplemental filings to the FERC.

2.1 GEOLOGY AND SOILS

2.1.1 Geology

Geologic Setting

In New Jersey, the Skillman and Pleasant Run Loops are within the Piedmont Physiographic Province which has varied topography ranging from lowlands in the east to peaks and ridges of moderate altitude and relief in the west (New Jersey Geological Survey (NJGS), 2000; NJGS, 2006a). As noted in section 1.6.2, the Skillman Loop crosses an upland area referred to as the Princeton Ridge between MPs 1776.8 and 1778.1. The Skillman Loop would traverse low to locally moderate topographic slopes; none of the loops cross slopes in excess of 30 percent. Ground elevations along the Skillman Loop range from approximately 60 to 340 feet above mean sea level (AMSL). The majority of the Pleasant Run Loop traverses low to locally moderate topographic slopes, with less than 1 percent of the alignment crossing slopes in excess

of 30 percent. Ground elevations along the Pleasant Run Loop range from approximately 90 to 440 feet AMSL. Both of the loops in New Jersey are underlain primarily by Lower Jurassic- to Upper Triassic-age siltstone, mudstone, shale, and sandstone. Between MPs 1777.1 and 1777.9 within the Princeton Ridge, the Skillman Loop also crosses Jurassic-age diabase bedrock. Diabase is an igneous rock that intruded into the surrounding rock units. Overlying the bedrock units is soil formed in place by decomposition of the bedrock (residuum) and colluvium deposited along hillsides derived from the underlying rock. Loess and alluvium can be found deposited in low areas, and along stream valleys (Fullerton et al., 2003). The depth to bedrock is typically greater than 10.5 feet below the ground surface (bgs) in the area of both loops based on borings completed by Transco; more detailed information regarding the geology of the Princeton Ridge is provided below.

In Pennsylvania, the Franklin Loop is within the Glaciated Pocono Section of the Appalachian Plateaus Physiographic Province, which is characterized as a broad upland underlain primarily by flat-lying sedimentary bedrock. The Franklin Loop crosses primarily low to locally moderate slopes, with approximately 1 percent of the alignment crossing slopes in excess of 30 percent. Ground elevations along the Franklin Loop range from 1,465 to 1,940 feet AMSL. The Dorrance Loop is within the Appalachian Mountain Section of the Ridge and Valley Physiographic Province, which is characterized by narrow mountain ridges separated by wide valleys (Pennsylvania Department of Conservation and Natural Resources [PADCNR], 2000). The Dorrance Loop crosses primarily low to moderate slopes, with approximately 3 percent of the alignment crossing slopes in excess of 30 percent. Ground elevations along the Dorrance Loop range from 860 to 1,190 feet AMSL. Surficial geologic deposits in the area of the Franklin and Dorrance Loops are glacially formed ground and/or end moraine deposits consisting of loamy till. These deposits are discontinuous, and associated residuum and colluvium deposits can also be present (Fullerton et al., 2003). In the area of the Franklin Loop, Devonian- and Mississippian-age sedimentary rock, consisting primarily of sandstone, can be found at approximate depths greater than 9 feet bgs. In the area of the Dorrance Loop, the till is underlain by Devonian-age sedimentary rock comprised primarily of siltstone. Based on borings completed by Transco, depth to bedrock varies from approximately 3 feet to more than 15 feet, depending on location. The aboveground facilities, contractor/pipe yards, and access roads associated with the Project facilities in New Jersey and Pennsylvania would be located within the same general physiographic and geologic setting as the proposed pipeline loops described above.

Proposed modifications at other existing aboveground facilities on Transco's Mainline system in North Carolina, Virginia, and Maryland would occur within Transco's existing facility boundaries and/or rights-of-way. No substantive changes to geologic conditions would occur at these facilities and the potential for these facilities to be affected by geologic hazards is low. Therefore, these other aboveground facilities are not discussed further in this section.

Mineral Resources

Coal, copper, graphite, limonite, magnetite, and manganese have been mined historically in the general vicinity of the proposed facilities in Hunterdon County, New Jersey and Luzerne County, Pennsylvania. Based on our review of on-line state and federal database files for mines/mining resources, no Project facility would be located on or cross historic/inactive

underground mines or their tailings in either state (USGS, 2005a; 2006a; NJGS, 2006b; and Pennsylvania Spatial Data Access, 2008).

Active mines and mineral processing plants in the Project vicinity include iron oxide pigment, clay, sulfur, stone, sand/gravel, clay, silica, and peat. Only one active mining operation has been identified by Transco within 0.25 mile of the Project: a sand/gravel mine owned by Pocono Transcrete, Inc. The mine is approximately 330 feet southwest of the edge of the proposed workspace of the Franklin Loop between approximate MPs 63.1 to 63.3. Transco has evaluated the mine location and operation relative to the Project and concluded that it is highly unlikely that any surface disturbance from pipeline construction activities would affect this sand/gravel operation. Although the sand/gravel operation is located along a public road that would be used for access during pipeline construction, it is expected that traffic related to the mining operation would exit to the south and, therefore, not cross the pipeline workspace. Furthermore, any potential future mining would likely not expand toward the pipeline location because a residence is located between the sand/gravel operation and the pipeline. As such, we conclude that construction and operation of the Project would not affect operations at the Pocono Transcrete facility.

Oil and natural gas have historically been produced in Pennsylvania, including the recent development of natural gas from the Marcellus Shale in western Pennsylvania. This petroleum-bearing formation does not extend into New Jersey (Environmental Information Administration, 2010). Data from the State of Pennsylvania (PADEP, 2011a) indicate there are no oil and gas fields within 0.25 mile of Project facilities.

Because the proposed Project does not occur within 0.25 mile of historic or existing mining operations or active oil and gas fields, with the exception of the above referenced sand/gravel mine, we find that construction and operation of the Project would not adversely affect the development of mineral resources in the region.

Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. In the Project area these consist of seismic hazards (earthquakes, surface faulting, and soil liquefaction) and landslides.

Seismic Hazards

The Project area is located in a region of the United States with a mapped low to moderate earthquake hazard (USGS, 2005b; 2008; and 2009). Seismic events in proximity to the Project in New Jersey and Pennsylvania generally range from low to moderate intensity, and modeling by the USGS indicates that the potential for a major earthquake in the region is low. More specifically, the USGS estimates that there is a 10 percent chance for an earthquake to occur in the region within the next 50 years that would result in a peak ground acceleration of 2 to 4 percent of the acceleration due to gravity, and a 2 percent chance for an earthquake to occur in the region within the next 50 years that would result in ground movement of 5 to 12 percent peak ground acceleration. The perceived shaking from these events would range from light to strong, with the potential for damage ranging from none to light.

Seismic activity in New Jersey is generally concentrated in the northeastern portion of the state. In New Jersey, the proposed Skillman and Pleasant Run Loops either cross or are in close proximity to mapped fault lines. According to the NJGS, these faults are likely associated with the Ramapo Fault Zone that separates the Piedmont and Highlands Physiographic Provinces and span more than 185 miles from the Appalachian Mountains to the Piedmont area within New York (NJGS 1999). In New Jersey, the Ramapo Fault Zone crosses through Hunterdon, Somerset, Morris, Passaic, and Bergen Counties (Guglielmo, 2010). The faults associated with the Ramapo Fault Zone are approximately 230 to 190 million years old and are the likely source of the recent earthquakes in the northwestern portion of New Jersey. According to the USGS, there are no faults or folds in the Project region that are believed to be the source of magnitude 6.0 or greater earthquakes within the last 1.6 million years (USGS, 2008).

Seismic activity in Pennsylvania is generally concentrated in the southeastern portion of the state and is of low to moderate intensity. The nearest documented fault to the Franklin Loop is approximately 2.3 miles south of the loop, and the nearest documented fault to the Dorrance Loop is approximately 2.8 miles to the north of the loop.

Table 2.1.1-1 provides a summary of historical earthquakes that have occurred in the Project area (USGS, 2012a; 2012b).

TABLE 2.1.1-1

Historical Earthquakes in the Project Area

Date	Magnitude/ Intensity	Epicenter location	Nearest Project Facility	Affected Area	Resulting Damage
1783	Magnitude 5.3	Morris County, NJ	Pleasant Run Loop	Unknown	Unknown
September 1, 1895	Magnitude 4.1	High Bridge, NY	Pleasant Run Loop	Maine to Virginia	Buildings rocked, broken windows and articles fell from shelves.
May 31, 1908	Intensity VI	Allentown, PA	Greater than 25 miles from all proposed Project facilities	Localized	A few chimneys were shaken down.
February 21, 1954	Intensity VI	Wilkes-Barre, PA	Franklin and Dorrance Loops	Localized neighborhood within Wilkes-Barre	Caused by subsidence from an underground coal mine. Caused over $1 million of damage to residential buildings including impact on infrastructure (gas and water mains).
March 23, 1957	Magnitude 3.8	Hunterdon County, NJ	Pleasant Run Loop	West-central New Jersey	Windows broken, dishes broken, cracked chimneys, some walls cracked, and plaster fell.
February 3, 2009	Magnitude 3.0	Morris County, NJ	Pleasant Run Loop	Northern New Jersey	No damage reported. Rattled windows and shuddered walls were encountered.

For reference, the Modified Mercalli Intensity (MMI) scale is used for measuring the intensity and effects of an earthquake, while the Richter Magnitude (M) scale measures the energy released. Therefore, the two scales are not strictly correlatable. For general reference,

MMI's (noted by Roman numeral) are defined by the USGS as follows with a generally corresponding M scale (noted by numeric range) value:

- MMI IV/M 3.0-3.9: Vibrations felt by almost all people indoors and some outdoors. Some objects displaced. Sounds produced in structures. Some vehicles perceptibly rocked.
- MMI V/M 4.0-4.9: Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
- MMI VI /M 4.0-4.9: Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
- MMI VII/M 5.0-5.9: Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

Transco's existing Leidy Line was constructed in 1958 after all but one of the earthquakes experienced in the vicinity of the Project. No damage occurred to any Transco facilities due to the February 3, 2009 earthquake in Morris County, New Jersey.

Soil liquefaction is a phenomenon in which saturated, non-cohesive soils temporarily lose their strength when subjected to forces such as intense and prolonged ground shaking. Soil and shallow groundwater conditions necessary for liquefaction to occur may exist in portions of the Project area. However, due to the low potential for strong and prolonged ground shaking to occur in the Project area as indicated by the USGS, the potential for soil liquefaction to occur is considered low.

The proposed loops and new and modified aboveground facilities would be designed, installed, and operated in accordance with 49 CFR 192. Empirical reviews of historical earthquakes demonstrate that welded steel pipelines are not prone to failure due to earthquakes. A 1996 study of earthquake performance data for steel transmission lines and distribution supply lines operated by SoCal Gas over a 61-year period found that post-1945 arc-welded transmission pipelines in good repair have never experienced a break or leak during a southern California earthquake and are the most resistant type of piping, vulnerable only to very large and abrupt ground displacement (e.g., severe landslides), and are generally highly resistant to traveling ground wave effects and moderate amounts of permanent deformation (O'Rourke and Palmer 1994; O'Rourke, M.J., and X. Liu, 1999). Because the Project would be constructed in accordance with federal standards and considering that the potential for seismic-related activity to impact the Project is low, we conclude that the risk of damage to the proposed facilities from seismic activity is not significant.

Landslides

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides can be initiated by heavy rainfall, earthquakes, changes in groundwater conditions, and/or slope disturbance resulting from construction activity. Generally, Transco selected areas with low slopes for the siting of compressor stations and other aboveground facilities; therefore, slope failure is not expected at aboveground facility locations. However, slope failures and

subsequent landslides represent a potential hazard to the buried pipeline along portions of the Project route that traverses areas of steep slopes. Factors that would increase the potential for slope failures along steep slopes include cutting along slopes, the weight of construction equipment, and unusually high precipitation or snowmelt saturating near surface earth materials.

Landslides in the portion of New Jersey where the Project is located have included debris flows, rock slides, and rock falls. The Skillman and Pleasant Run Loops are generally in an area with low landslide incidence, with 1.5 percent of the area involved in landslides (Godt, 1997). The Skillman Loop does not cross any slopes that are greater than 30 percent, while the Pleasant Run Loop crosses less than 0.1 mile of steep (greater than 30 percent) slopes. However, Transco has reported that a small percentage of the Princeton Ridge portion of the Skillman Loop has slopes over 15 percent, which is defined as "steep" for non-residential uses under Princeton Township ordinances. Most of the steep slopes in Princeton Ridge are well-vegetated, although farm fields and residential properties may extend to the edge of slopes.

No historic landslides are mapped near the Skillman Loop or near the Project aboveground facilities in New Jersey (NJGS, 2012). Historic debris flows have been found 1 mile north of the Pleasant Run Loop area.

Landslides have occurred throughout Pennsylvania and include rock and debris slides, debris avalanches, and slumps on lower slopes and stream banks (PADCNR, 2001). Both the Franklin and Dorrance Loops are in an area with moderate incidence of landslide activity, with 1.5 to 15 percent of the area involved in landslides (Godt, 1997). The Franklin and Dorrance Loops cross approximately 0.1 mile and 0.2 mile of steep slopes, respectively. A historic slump is mapped approximately 3 miles west of the Dorrance Loop. No historic landslides are mapped near the Project aboveground facilities in Pennsylvania.

Although landslides could potentially occur in the Project area, there is no evidence along the Project corridor of recent landslide history. Transco would adhere to its Plan and Procedures as well as measures described in its E&SCPs to mitigate potential risk of slope failure during construction. These measures would control water and erosion during construction and reestablish vegetation cover as soon as possible following final grading. As such, we find that the potential for landslides to affect the proposed Project is low.

Blasting

Transco reviewed federal soil survey databases (U.S. Department of Agriculture (USDA), 1986; 2004) and completed preliminary geotechnical surveys of the Project area to determine, in part, the depth and nature of underlying bedrock. Table 2.1.1-2 summarizes the locations where potential shallow bedrock, mapped by soil survey (defined here as less than or equal to 15 feet bgs) or by geotechnical survey (defined here as less than or equal to 6.5 feet bgs), is anticipated along the Project route.

As shown in table 2.1.1-2, approximately 14.8 miles (49 percent) of the proposed pipeline loops are potentially underlain by shallow bedrock. Based on the lithology of the underlying geologic formations present along the Project construction area and preliminary geotechnical survey results in the Project area, Transco expects that the shallow bedrock could

be ripped with construction equipment and does not anticipate that blasting would be required for construction. Transco would remove excess rock and place it in an approved dump site.

TABLE 2.1.1-2

Shallow Bedrock in the Project Area

Project Loop	Depth	Milepost Begin	Milepost End	Approximate Total Miles
Skillman Loop	<15 feet	1776.79	1776.95	0.16
	<15 feet	1777.86	1778.68	0.82
	<15 feet	1779.72	1779.97	0.25
			Subtotal	1.23
Pleasant Run Loop	<6.5 feet	0.29	0.41	0.12
	<6.5 feet	0.50	0.63	0.13
	<6.5 feet	0.65	0.68	0.03
	<6.5 feet	0.73	0.75	0.02
	<6.5 feet	1.04	1.09	0.05
	<6.5 feet	1.19	1.21	0.02
	<6.5 feet	1.24	1.47	0.23
	<6.5 feet	1.61	2.28	0.67
	<6.5 feet	2.36	2.83	0.47
	<6.5 feet	3.03	3.07	0.04
	<6.5 feet	3.19	3.21	0.02
	<6.5 feet	3.36	5.14	1.78
	<6.5 feet	5.24	6.21	0.97
	<6.5 feet	6.37	6.42	0.05
			Subtotal	4.6
Franklin Loop	<15 feet	57.51	58.41	0.9
	<15 feet	60.75	60.82	0.07
	<15 feet	61.29	61.34	0.05
	<15 feet	61.81	62.06	0.25
	<15 feet	62.39	62.72	0.33
	<15 feet	64.53	64.61	0.08
	<15 feet	64.91	65.62	0.71
	<15 feet	65.69	66.04	0.35
	<15 feet	66.58	68.95	2.37
			Subtotal	5.11
Dorrance Loop	<15 feet	17.69	18.21	0.52
	<15 feet	19.12	20.76	1.64
	<15 feet	20.99	22.18	1.19
	<15 feet	22.48	22.97	0.49
			Subtotal	3.84
Project Total				14.78

We received numerous comments regarding the presence of hard, shallow bedrock and large boulders in the Princeton Ridge area of the Skillman Loop. The Princeton Ridge area crosses a major sheet-like intrusion of dark greenish gray to black, medium to fine grained diabase. Thermally altered sedimentary rocks of the Passaic Formation occur below the diabase, and also above where the diabase is not exposed at ground surface. Overlying the diabase is sandy, silty diabase saprolite and rock rubble consisting of rounded and broken boulders derived from the diabase. The thickness of the saprolite can be as much as 20 feet.

As noted in section 1.6.2, Transco conducted geophysical and geotechnical studies of the proposed construction right-of-way of the Skillman Loop in the Princeton Ridge area. More specifically, 2-dimensional Electrical Resistivity Imaging, seismic refraction techniques, and ground penetrating radar were utilized to identify the depth to bedrock, the potential presence and dimensions of boulders in the subsurface, and to assess methods for bedrock and boulder removal. Global Positioning System mapping was also completed to document the locations of bedrock exposures and large boulders at the ground surface. In addition to the geophysical surveys summarized above, Transco installed 10 preliminary geotechnical borings in the Princeton Ridge right-of-way to confirm the depth to bedrock and to characterize the physical properties of soil and bedrock through standard laboratory testing. Depths of the preliminary geotechnical borings ranged from 13 to 125 feet, and rock coring was conducted in three of the borings. In addition to the preliminary geotechnical borings, Transco installed 86 borings to depths ranging from 1 to 18 feet to confirm the presence of subsurface boulders and shallow bedrock indicated by the geophysical surveys. Details regarding these surveys are included in Transco's site-specific Rock Handling Plan prepared for the Princeton Ridge with input from Princeton Ridge stakeholders.

Based on the geophysical and geotechnical surveys above, Transco determined that approximately 20 percent of the trenching across the Princeton Ridge would encounter only soil; 19 percent would encounter shallow bedrock; 46 percent would encounter surface and subsurface boulders; and 15 percent would encounter both shallow bedrock and boulders. As detailed in the Rock Handling Plan and other supplemental information provided by Transco on June 2, 2014, the company has committed to implement the following measures:

- Transco would take the existing pipeline out of service, estimated to be 3 to 6 weeks, during the most intrusive aspects of construction, including excavation of rock by utilizing the rock hammer technique.

- Transco would evacuate the existing natural gas pipeline and replace with water during proposed outage, conduct a hydrostatic test of the pipeline prior to returning it to service, and perform an in-line inspection of the pipeline after it is returned to service.

- The centerline of the existing pipeline would be located and then boulders on the surface above the existing pipeline and the Skillman Loop trench would be carefully removed. Fill would be used to ensure a minimum of 3 feet of cover over the existing pipeline.

- A wooden mat bridge would then be installed over the existing pipeline to provide an air space between the ground surface and the construction equipment used to install the Skillman Loop, thereby reducing direct stress on the existing pipeline (see section 2.9).

- Boulders and shallow bedrock within the Skillman Loop trenchline would then be removed through a series of non-blasting techniques including use of a hydraulic hammer, the use of pre-drilling to facilitate breaking with the hydraulic hammer, and the use of expansive grout to split boulders and bedrock in place followed by the use of the hydraulic hammer, if needed.

We find the bedrock and boulder identification process and removal measures in Transco's Rock Handling Plan to be acceptable.

Along the remaining portions of the Project loops, Transco would use blasting only after all other reasonable means of excavation (e.g., rock trenchers, rock saws, jack hammers) have been attempted and are unsuccessful. However, if blasting is deemed necessary, Transco would hire a licensed contractor to conduct the blasting operations. Transco developed a Blasting Plan for the Project detailing how blasting would be conducted, and outlining measures that avoid and/or minimize impacts related to blasting. Transco would obtain all necessary permits and blasting would be conducted by state-licensed blasting specialists to ensure safety and to minimize the potential for damage to facilities and resources outside of the blast area. Some of the specific measures that would be implemented to avoid or minimize blasting effects include:

- optimization of blast charge size and delay timing to minimize vibration;
- use of warning signs, site access control, and audible warning signals before and after a blast;
- seismograph vibration monitoring during blasting to assess vibrations generated by a blast;
- procedures for safe blasting materials handling, storage, and use;
- pre- and post-blast surveys of water supply wells within 150 feet of the blasting area;
- pre- and post-blast condition surveys on nearby structures or utilities;
- use of matting to contain the potential for airborne debris; and
- repair or replacement of utilities or structures damaged by blasting.

In the event blasting activities result in damage to structures, utilities, water supply wells, or springs, Transco has committed to repairing the affected entity to pre-blast conditions. Based on the mitigation measures described in Transco's Blasting Plan, we find that potential impacts due to blasting would not be significant.

Paleontological Resources

Transco consulted with the New Jersey State Museum and Pennsylvania Topographic and Geologic Survey (PATGS) regarding identification of important or recognized fossil assemblages that may be located in the Project area.

The New Jersey State Museum indicated that some rare finds may be present near the proposed Project area and recommended that the proposed Skillman Loop be monitored by Transco for possible fossil resources. The probability of encountering significant paleontological resources along the Pleasant Run Loop is low and only common fossils would be expected in these areas.

The PATGS indicated that, although fossils are present in various bedrock formations underlying the Project footprint, encountering significant paleontological resources in the bedrock beneath the proposed Project area in Pennsylvania is low, though still a possibility.

To minimize impacts on paleontological resources, Transco would develop an unanticipated paleontological discovery training program for its EIs and construction contractors. The training program would be prepared, in part, by a qualified geoscientist in conjunction with experts from the NJGS and the PATGS. EI and contractor training would include:

- the nature and appearance of the types of known fossil remains and fossil traces that could potentially occur in the geologic formations being excavated along the pipeline alignment;
- methods of safely inspecting geologic materials exposed in the respective excavations, as well as the excavation spoils prior to their re-use or disposal; and
- procedures to be taken should an unanticipated paleontological discovery be made including notification of the NJGS or PATGS, dependent on location.

The training would also implement a strict policy prohibiting the removal of paleontological resource including whole or partial fossils, traces, or impressions of animals or plants that occur as part of the geological record. Based on the low potential for paleontological resources to be present in the Project area, and Transco's implementation of its training program, we find that the Project would not significantly impact paleontological resources.

2.1.2 Soils

Pipeline Facilities

Soils crossed by the Project were identified and assessed using USDA databases and soils surveys (USDA, 1986; 2004). In addition, borings were installed to characterize soils within the proposed construction right-of-way of the Skillman Loop in the Princeton Ridge area.

The soils affected by the Project were evaluated to identify prime farmland and major soil characteristics that could affect construction or increase the potential for construction-related soil impacts (see table 2.1.2-1). Soils in the Project area are highly variable, ranging from shallow to deep, nearly level to steeply sloping, poorly to well drained, and with textures ranging from silts and loam to coarse rock fragments. Individual soil characteristics are included in table 2.1.2-1 and discussed below.

Prime Farmland

According to the USDA, prime farmland soils consist of soils classified as those best suited for production of food, feed, forage, fiber, and oilseed crops (USDA, 2004). Prime farmland soils generally meet the following criteria: have an adequate water supply, either from precipitation or irrigation; contain few or no rocks; are permeable to water and air; are not excessively erodible or saturated for long time periods; and either do not flood frequently or are protected from flooding. The soils designated as prime farmland in table 2.1.2-1 also include those designated as farmland of statewide importance. This land potentially could meet or

exceed yields of prime farmland; however, it does not meet the criteria for prime farmland, because it would require treatment and maintenance to meet or exceed prime farmland yields. The Project facilities would impact approximately 77.0 acres of prime farmland soils in New Jersey and 163.7 acres of prime farmland soils in Pennsylvania.

TABLE 2.1.2-1

Characteristics of Soils Affected by the Project (acres) [a]

Loop	Prime Farmland [b]	Highly Erodible [c]	Hydric [d]	Compaction-Prone/Prone to Rutting [e]	Stony/Rocky [f]	Poor Revegetation [g]
Skillman	74.6	13.4	1.8	80.9	6.1	19.4
Pleasant Run	89.1	51.1	0.0	110.0	14.4	51.8
Franklin	49.8	41.6	22.5	142.8	98.1	115.0
Dorrance	27.3	40.8	4.2	29.5	20.5	37.2
Pipeline Total	**240.7**	**146.8**	**28.6**	**363.2**	**139.2**	**223.4**

[a] An area may have more than one characteristic.
[b] Soils classified as prime farmland including farmland of statewide importance.
[c] Soils classified as having severe erosion potential.
[d] Soils classified as all hydric; partially hydric soils are not included.
[e] Soils classified as having severe rutting potential.
[f] Soils with a high stony or rocky rating, indicating soils with rock outcrops or extremely stony modifier to the textural class within a soil association, or with a surface horizon that contains greater than 15 percent by weight rock fragments larger than 3 inches.
[g] Soils with slopes greater than 8 percent or having greater than 15 percent coarse rock and stone fragments in the surface layer.

During pipeline construction, the topsoil from these areas would be stripped and segregated from the subsoil in accordance with Transco's Plan and E&SCPs. Segregated topsoil would be returned following backfilling of the subsoil, ensuring preservation of topsoil within the construction area. Prime farmland soils crossed by the pipeline loops that are active croplands would be returned to their previous agricultural use after completion of the Project. Consequently, we conclude there would be no significant impact on or loss of prime farmland.

Transco identified the location of drain tiles in agricultural land that would be crossed by the Project. Transco stated that it would probe active drain tiles to determine if any damage has occurred during construction. Should damage occur, Transco committed to repairing the tiles to their original condition or better and would monitor the drainage systems after construction to ensure their performance remains consistent with preconstruction conditions.

Erosion

Short-term increases in erosion can occur as a result of the removal of vegetation during clearing and grading activities and the subsequent exposure of topsoil to wind and precipitation. In addition, in areas where vegetation is slow to become reestablished, increased erosion can occur. Increased erosion of soils is of special concern near waterbodies where erosion can result in increased sedimentation.

Soils most susceptible to erosion by water are typified by bare or sparse vegetation cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Soils typically more resistant to erosion by water include those that occupy low relief areas, are well vegetated, and have high infiltration capacity and internal permeability. Wind erosion processes

are less affected by slope angles than water erosion processes. Wind-induced erosion often occurs on dry soil where vegetation cover is sparse and strong winds are prevalent. Approximately 146.8 acres of the Project soils are considered highly susceptible to erosion by water and wind.

We received comments from the Municipality of Princeton, Montgomery Township, and several landowners concerning the potential for increased erosion and sedimentation into wetlands and waterbodies during Project construction, especially during storm events. To minimize or avoid potential impacts due to soil erosion and waterbody sedimentation, Transco would utilize erosion and sedimentation control devices in accordance with its Plan, Procedures, and E&SCPs. Temporary erosion controls, including interceptor diversions, slope breakers, and sediment filters (such as hay bales and silt fences) would be installed immediately after initial disturbance of the soil. Temporary erosion controls would be regularly inspected and after each rainfall event of 0.5 inch or greater. These temporary controls would be maintained throughout construction until replaced by permanent erosion control measures or until restoration is complete. In addition, Transco would implement the restoration and revegetation measures in its Plan, Procedures, and county-specific E&SCPs. Therefore, we find that construction and operation of the Project would not result in significant impacts from erosion and sedimentation.

Hydric Soils and Compaction/Rutting Potential

Hydric soils are "formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register, USDA 1994). Construction through hydric soils and wetlands is discussed in section 2.2.4. Due to their extended periods of saturation, hydric soils can be prone to compaction and rutting. Approximately 28.6 acres of the soils affected by the Project are considered hydric and 363.2 acres are considered susceptible to compaction and rutting.

We received comments concerning the potential of increased runoff due to soil compaction caused by construction activities. Soil compaction modifies soil structure and can reduce the porosity and moisture-holding capability of the soil, thus restricting rooting depth. Compaction also decreases infiltration and thus increases runoff and the potential for water erosion.

The proposed wetland construction crossing techniques, as contained in Transco's Procedures and E&SCPs, would reduce impacts on hydric soils. In general, rutting and compaction of soils would be avoided or minimized through the use of low-ground-pressure equipment and installing temporary equipment mats, as deemed necessary during construction. Additional construction procedures and mitigation measures that Transco would implement to reduce impacts on wetlands are discussed in section 2.2.4. In addition, Transco would minimize the potential for rutting in active agricultural lands by stripping topsoil, as noted above, and by employing subsurface decompaction techniques utilizing rippers, paraplows, or similar decompaction equipment in accordance with Transco's Plan and Procedures.

With the implementation of mitigation measures in Transco's Plan, Procedures, and E&SCPs, we find that construction and operation of the Project would not result in significant impacts from compaction and rutting of soils.

Stakeholders in the Princeton Ridge area, including the Princeton Ridge Coalition and their consultant, raised concern that soft, saturated soils could increase the risk of damage to the existing pipeline due to a decreased ability to support construction equipment operating over the existing pipeline. As discussed in sections 1.6.2 and 2.1, Transco installed 10 geotechnical soil borings and 86 confirmatory borings to evaluate soil characteristics, depth to bedrock, and the occurrence of boulders in the Princeton Ridge area. The soils data obtained by Transco did not indicate any soils that would be classified as soft surrounding the existing pipeline. As discussed in section 2.9, stress analysis based on field data concluded that the existing pipeline would not experience stress in excess of allowable limits under Transco's proposed construction methods, which includes utilizing a mat bridge to avoid direct stress on the ground surface over the existing pipeline. Although localized areas of soft soils could exist in the Princeton Ridge area, Transco would monitor the mat bridge during construction to ensure that the air gap remains over the existing pipeline and would discontinue construction if equipment cannot be supported on the mat bridging. In section 2.9.1, we recommend that Transco provide a written plan detailing the specific measures that would be implemented to monitor for and maintain the proposed air gap over the existing pipeline including, but not limited to, areas of highly saturated soil conditions. Details of Transco's data and analysis are presented in the site-specific Rock Handling Plan prepared for the Princeton Ridge area.

Stony/Rocky and Shallow-to-Bedrocks soils

The presence of stone- or rock-bearing soils can interfere with agricultural practices and inhibit revegetation efforts. Approximately 139.2 acres of land that would be crossed by the Project would be underlain by stony/rocky soils.

As shown in table 2.1.1-2 and discussed in section 2.1.1, the proposed pipeline loops would cross approximately 14.8 miles of soils that are potentially underlain by shallow bedrock. If bedrock is encountered within the trench during construction, Transco would remove the rock with construction equipment; blasting is not anticipated for construction of the Project. Transco's plans to remove boulders and bedrock from the right-of-way in the Princeton Ridge are detailed in the Rock Handling Plan. As discussed in section 2.1.1, we find this plan to be acceptable.

With implementation of these mitigation measures, we find that potential impacts on soil productivity and quality resulting from introducing stones and rock to surface horizons as a result of construction and operation of the Project would not be significant.

Revegetation Potential

Successful restoration and revegetation are important for maintaining soil productivity and protecting the underlying soil from potential damage, such as erosion. The revegetation potential of soils disturbed by the Project was evaluated based on the slope and the percentage of coarse rock fragments in the surface layer. Steep slopes that are either poorly vegetated or exhibit no vegetation cover are susceptible to erosion. Stony soils can reduce the efficiency and productivity of a soil by reducing infiltration and increasing surface run off. The coarser-textured soils also have a lower water holding capacity following precipitation, which could result in moisture deficiencies in the root zone and create unfavorable conditions for many

plants. The Project would cross approximately 223.4 acres of soils that are classified as having poor revegetation potential.

Transco would implement measures described in its Plan, Procedures, and E&SCPs to promote revegetation of all disturbed areas. In areas with more than 12 inches of topsoil, Transco would remove and segregate topsoil to a depth of at least 12 inches. In soils with less than 12 inches of topsoil, the entire topsoil horizon would be segregated. Following construction, the corridor would be restored with the segregated topsoil and revegetated. Transco would also implement the site-specific measures detailed in its PRCRP to restore the construction right-of-way in the Princeton Ridge area (see sections 1.6.2 and 2.3). We conclude that these measures would enhance and encourage the successful revegetation of areas disturbed by the Project.

In general, Transco would implement the measures in its Plan and Procedures and county-specific E&SCPs to minimize and mitigate impacts on soils affected by construction and operation of the Project. By implementing these measures and reducing the construction workspace to the extent feasible, the Project would not have significant impacts on soil resources.

Aboveground Facilities

We reviewed the soils at the aboveground facilities to identify prime farmland and major soil characteristics that could affect construction or increase the potential for construction-related soil impacts. Construction at aboveground facilities would consist of modifications to existing facilities, primarily within fence lines or previously disturbed pipeline rights-of-way. Transco would implement the construction and restoration measures in its Project-specific Plan, Procedures, and E&SCPs to minimize impacts on soils and encourage revegetation at aboveground facility locations. Therefore, we find that potential impacts on soils from construction and operation of the proposed aboveground facilities would not be significant.

Contractor/Pipe Storage Yards and Contractor Staging Areas

Transco proposes to use contractor/pipe storage yards and contractor staging areas at 17 locations, about 85.5 acres of land, on a temporary basis to support construction activities. Upon completion of construction, Transco would restore the yards in accordance with its Project-specific Plan, Procedures, and E&SCPs, and prior use of the sites would continue. With implementation of Transco's restoration measures, we find that potential impacts on soils at the yards and staging areas would not be significant.

Access Roads

Public roads and the construction right-of-way would be used for primary access to the pipeline loops and aboveground facilities during construction. Transco also proposes to modify 16 private, existing roads and construct 5 new roads for access during construction. The majority of these roads have an aggregate, dirt, or vegetation surface and would require improvements such as grading, the placement of aggregate, and tree clearing based on the equipment that would use the road. Modifications to existing temporary access roads would

affect about 1.3 acres of land in New Jersey and 6.0 acres of land in Pennsylvania during construction.

Of the roads requiring modification, Transco would permanently maintain six roads following construction for aboveground facility access. These permanent access roads would affect 2.3 acres of land in New Jersey and 0.8 acre of land in Pennsylvania. Transco would restore the remaining roads to their previous condition in accordance with its Project-specific Plan, Procedures, and E&SCPs. Therefore, we conclude that impacts on soils by construction and operation of access roads would not be significant.

Contaminated Soils

Based on a search of various state and federal environmental databases for potential soil contamination sources within 0.25 mile of Project facilities, we identified seven potential sources near the Skillman Loop and six potential sources near the Pleasant Run Loop, respectively, in New Jersey. Seven potential sources were identified within 0.25 mile of the Franklin Loop and no sites were identified near the Dorrance Loop in Pennsylvania. Based on our review of the environmental databases and alignment sheets, the Project would not cross any potentially contaminated sites. However, Transco is currently consulting with the state project managers to determine if construction activities associated with the Project may interfere with investigation and/or remediation efforts. In addition, Transco has developed an Unanticipated Discovery of Contamination Plan, which includes measures that it would implement in the event contaminated media is encountered during construction. We have reviewed Transco's Unanticipated Discovery of Contamination Plan and find it acceptable. Therefore, we conclude that the Project would not have a significant impact on contaminated soils.

2.2 WATER RESOURCES, FISHERIES, AND WETLANDS

2.2.1 Groundwater

Existing Groundwater Resources

Generally, the Project facilities overlie groundwater resources found in bedrock aquifers; there are no significant surficial alluvial or glacial sediment aquifers underlying the Project (USGS, 2006b). The Skillman and Pleasant Run Loops and Compressor Stations 205, 165, and 185 overlie primarily the Brunswick Aquifer which is comprised of sandstone, siltstone, and shale with some limestone and conglomerate. An aquifer comprised of diabase is also present under a portion of the Skillman Loop. These bedrock aquifers are confined, with groundwater found primarily within fractures, joints, and bedding planes (Herman et al., 1999; Trapp and Horn, 1997). Within the aquifers, groundwater levels range from approximately 4 to over 60 feet bgs, dependent on location (USGS, 2011). Groundwater quality is generally suitable for drinking and other uses. Wells are drilled between 36 and 660 feet deep and yields vary between 101 to 250 gallons per minute (gpm) for the sedimentary rock and less than 25 gpm in the diabase.

In Pennsylvania, the Franklin Loop and Compressor Stations 515 and 517 are underlain by confined sedimentary aquifers comprised primarily of sandstone and siltstone (PADCNR,

2001; Trapp and Horn, 1997). These groundwater sources produce sufficient water of generally good quality for domestic and commercial supplies. Water yields for the bedrock aquifer are not available. Well depths range from 15 to 500 feet with water levels at approximately 8 to 35 feet deep bgs dependent on location (USGS, 2011). The Dorrance Loop and Compressor Station 520 are underlain by confined, sedimentary rock aquifers comprised of fractured sandstone and shale (PADCNR, 2001; Trapp and Horn, 1997). Groundwater is generally of good quality. Wells range in depth from 17 to 100 feet and depth to groundwater is reported as ranging from 24 to 105 feet bgs (USGS, 2011). Well yields were not reported.

Compressor Stations 145, 170, 175, 180, and 190, and other aboveground facilities on Transco's Mainline system that would be modified overlie primarily crystalline rock aquifers, though small areas of sedimentary rock are present. The crystalline rock aquifers consist of both metamorphic and igneous rocks. The sedimentary rock is comprised of conglomerate, sandstone, and shale. Groundwater movement and storage in the crystalline aquifer areas is predominantly in the overlying regolith or through fractures. Well yields in the crystalline rock are relatively low with an average yield of 18 gpm (Trapp and Horn, 1997). Because Project activities at the aboveground facilities would involve minor modifications with limited direct ground disturbance, the potential impact of these facility modifications on groundwater resources is low. Therefore, these Project facilities are not discussed further in this section.

Sole Source Aquifers

The EPA defines a principal, or sole source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. The proposed Skillman and Pleasant Run Loops and Compressor Station 205 are within the Northwest New Jersey 15 Basin sole source aquifer. This aquifer occurs at depths of 20 to 40 feet bgs, intersecting with the ground surface in area streams and wetlands, and it includes both ground- and surface water resources (EPA, 1988). Drinking water within the sole source aquifer is derived primarily from surface water sources that provide potable water to 114 municipalities in eight counties in New Jersey and New York.

Water Supply Wells, Springs, and Well Head Protection Areas

Table 2.2.1-1 lists potable water supply wells within 150 feet of the Project construction workspace as identified by Transco through database review, field surveys, and/or interviews with landowners. All of the identified wells are private. No springs have been identified within 150 feet of the construction workspace.

TABLE 2.2.1-1

Private Water Supply Wells within 150 feet of the Construction Right-of-Way

State/Facility/Milepost [a]	Approximate Distance/Direction [b] from Construction Right-of-Way (feet)	State/Facility/Milepost [a]	Approximate Distance/Direction [b] from Construction Right-of-Way (feet)
New Jersey		**Pennsylvania**	
Skillman Loop		Franklin Loop	
1777.3	7/E	57.8	94/NE
1777.3	30/E	57.8	118/NE
1777.3	78/W	58.0	37/NE
1780.3	2/S	61.5	117/SW
1782.2	91/E	61.5	51/NE
Pleasant Run Loop		61.6	56/NE
1.4	93/NE	61.6	96/SW
1.4	82/SW	61.6	138/SW
1.5	87/NE	61.6	55/NE
1.6	2/SW	61.7	120/SW
1.6	20/SW	61.7	145/SW
2.7	54/NE	62.0	83/SW
2.9	130/NE	62.2	Within workspace (0)
3.5	16/NE	62.3	93/NE
3.9	98/NE	62.3	40/SW
5.2	64/NE	62.5	41/NE
5.9	113/E	62.5	11/NE
5.9	53/SW	62.6	20/SW
6.6	90/NE	62.6	Within workspace (0)
6.7	117/NE	63.7	26/W
6.7	57/NE	64.0	86/SW
6.7	119/SW	68.4	39/NE
6.8	68/SW	Dorrance Loop	
		19.3	145/N
		19.4	36/N
		19.4	145/S
		22.3	95/S

[a] Mileposts for the proposed facilities are based on the milepost numbering convention on Transco's existing pipeline systems.

[b] State agencies did not disclose the exact location of certain water resources; Transco would verify the exact location of wells and any springs in the vicinity of the Project during landowner discussions.

Transco reviewed state databases and contacted state and local agencies to identify public wellhead protection areas (WHPAs) or source water protection plans, which are areas surrounding public water supplies in which land use planning protective of groundwater resources may be implemented. The PADEP does not provide site-specific information regarding source water protection plans, but stated that there are no PADEP recognized source water protection programs in the area of the proposed facilities in Pennsylvania. In New Jersey, Transco determined that the Skillman and Pleasant Run Loops would cross WHPAs in Branchburg and Montgomery Townships. Transco would implement the measures in its Plan, Procedures, and E&SCPs to avoid or minimize impacts on groundwater resources, including

WHPAs and has specifically worked with Branchburg and Montgomery Townships to minimize Project impacts in the area.

Contaminated Groundwater

Based on a search of various state and federal environmental databases, no known groundwater contamination occurs at any of the Project facilities or within 0.25 mile of Project facilities in Pennsylvania. In New Jersey, five contaminated sites were identified within 0.25 mile of the proposed Project. Of these five sites, two are listed with the NJDEP as requiring no further action. One of the three remaining sites was identified less than 0.02 mile west of the Skillman Loop. The NJDEP lists this site as "pending"; however, information from Transco indicates that contamination is localized to underlying soils. The two remaining sites are approximately 0.1 to 0.2 mile from the Pleasant Run Loop and are listed as "active." The NJDEP indicates the sources of the groundwater contamination at these sites are known and localized to the points of release. No sites were identified near the compressor stations.

General Impacts and Mitigation

The majority of construction would involve shallow, temporary, and localized excavation or grading. The water table in the Project area is generally below the expected trench excavation depth, but could be intersected especially near wetlands and surface waterbodies. Shallow aquifers and unmapped perched groundwater bodies could also sustain impacts from changes in overland water flow and recharge caused by clearing and grading of the right-of-way. Any impacts would be minor, temporary, and localized to the construction area. Transco would further reduce these impacts by the use of construction and restoration techniques described in its Plan, Procedures, and E&SCPs.

Shallow groundwater could be vulnerable to contamination caused by inadvertent surface spills of hazardous materials used during construction. Transco's SPCC Plan includes preventative and corrective measures that would be used to minimize the potential for groundwater impacts associated with an inadvertent spill of fuel, oil, and other hazardous fluids. In the event that previously existing contamination is encountered, Transco would implement the measures contained in its Unanticipated Discovery of Contamination Plan to protect human health and worker safety; prevent the spread of contamination; and comply with applicable state and federal regulations.

Project construction could potentially impact the water quality and capacity of nearby water supply wells. As noted in section 2.1.1, Transco does not anticipate that blasting would be necessary to complete the Project. However, in the event blasting is required, Transco would implement the measures in its Blasting Plan to minimize potential blasting-related impacts on nearby wells. Transco would also prohibit fueling within 200 feet of a private water well and 400 feet of a public water well and WHPAs. Transco would verify exact locations of wells within 150 feet of the construction workspace through civil survey and continued communication with landowners. With the well-owner's permission, Transco would use a qualified, independent contractor to conduct pre- and post-construction testing of water quality and yield in all wells within 150 feet of the construction workspace. Transco has stated that wells located within the construction footprint would either be relocated prior to construction or protected with a

minimum setback/buffer and safety fence, and that timber mats would be utilized to protect the well head if construction equipment would be used in the vicinity of a well. Transco has also committed to repair or replace any wells that are permanently damaged by the Project and to file a report with the Secretary identifying all water supply wells/systems damaged by construction and how they were repaired or replaced. The report would include a discussion of any other complaints concerning well yield or water quality and how each problem was resolved.

The potential to encounter contaminated groundwater from nearby sites is low. However, Transco would continue to consult with the NJDEP regarding nearby contaminated sites (both soils and groundwater) to determine if construction activities associated with the Project may interfere with investigation and/or remediation efforts at these sites. In section 2.1.1 we recommend that Transco file the results of its consultations with state project managers regarding the potential for Project construction to impact nearby contaminated sites. Project construction would be conducted in accordance with applicable state regulations regarding these contamination sites.

Based on implementation of Transco's construction procedures and mitigation measures and our recommendations, we find that the Project would not result in any significant long-term or permanent impacts on groundwater resources or users of groundwater in the Project area.

2.2.2 Surface Water

Existing Surface Water Resources

Perennial and Intermittent Waterbodies

The pipeline loops would cross 32 perennial waterbodies, 8 intermittent waterbodies, and 6 ephemeral waterbodies in New Jersey; and 26 perennial waterbodies, 7 intermittent waterbodies, and 4 ephemeral waterbodies in Pennsylvania.

Two of Transco's proposed access roads would cross waterbodies, one along the Pleasant Run Loop and one along the Franklin Loop. Temporary culverts would be utilized to cross both of these waterbodies. Two intermittent waterbodies are also located within a contractor staging area along the Franklin Loop.

Appendix G lists the waterbodies affected by the Project. No surface waterbodies would be affected by the modifications to Project-related existing aboveground facilities, including compressor stations, meter stations, and MLVs.

Sensitive Waterbodies

Waterbodies may be considered sensitive for a number of reasons including, but not limited to, high quality or exceptional value designations, the presence of impaired water (CWA section 303d) or contaminated sediments, its use as a potable water source, or the presence of sensitive species or critical habitat. Waterbodies may also be considered sensitive if they are of special interest to a land management agency.

The Project would cross 45 waterbodies considered sensitive based on the above criteria. No waterbodies crossed by the Project contain federal essential fish habitat or threatened or endangered species. Three waterbodies crossed by the Project are listed as impaired on the Pennsylvania and New Jersey 303 (d) lists: Tobyhanna Creek (MP 61.0 of the Franklin Loop), Rock Brook (MP 1780.3 of the Skillman Loop), and Back Brook (MP 1781.1 of the Skillman Loop). The remaining sensitive waterbodies are so classified due to their state designation as high quality waters (see table 2.2.3-1).

We received comments concerning Project-related impacts on the Raritan River in New Jersey, which is a major source of drinking water for the region. The Project would cross secondary tributaries of the Raritan River, but would not cross the river itself or any of its primary tributaries. Therefore, the potential for the Project to impact the Raritan River is low. Furthermore, Transco would implement construction and restoration measures outlined in its Procedures and E&SCPs which would minimize impacts on the secondary tributary waterbodies and further reduce the potential to impact the Raritan River.

Public Watershed Areas

Based on consultation with NJDEP (Girard, 2014) and PADEP (Agustini, 2013), there are no potable surface water intakes within 3 miles downstream of any waterbody crossings associated with the proposed loops in New Jersey or Pennsylvania.

Hydrostatic Testing

As discussed in section 1.6, Transco would verify the integrity of the pipelines before placing them into service by conducting hydrostatic testing as required by DOT regulations. Transco's estimated hydrostatic test water requirements, potential sources, and discharge locations are listed in table 2.2.2-1. Transco would follow federal, state, and local permit requirements with regard to water withdrawal and discharge.

TABLE 2.2.2-1

Potential Surface Water Sources of Hydrostatic Test Water for the Pipeline Facilities

State/Facility	Potential Source/Milepost	Quantity of Water Required (gallons)	Discharge Location/Milepost
New Jersey			
Skillman Loop	Beden Brook/1779.7	2,600,000	Beden Brook/1779.7
Pleasant Run Loop	Pleasant Run/3.3	2,800,000	Pleasant Run/3.3
Pennsylvania			
Franklin Loop	Tobyhanna Creek/65.5	2,300,000	Tobyhanna Creek/65.5
	Lehigh River/61.1	2,300,000	Lehigh River/61.1
Dorrance Loop	Little Wapwallopen Creek/20.8	2,100,000	Little Wapwallopen Creek/20.8
Pipeline Facilities Total		**12,100,000**	

Transco would obtain water for hydrostatic testing from surface waterbodies. Water withdrawals from surface waterbodies would be conducted in a manner that would not reduce water flow to a point that would impair flow or impact fish, recreational activities, or public usage. Pump intakes would be equipped with screening to minimize entrainment of aquatic species during withdrawal.

Upon completion of testing, the test water would be discharged to a well-vegetated upland area or the surface waterbodies identified in table 2.2.2-1 through an energy dissipation device and filtration device, and as approved by state regulatory authorities. When discharging to upland areas, Transco would use a dewatering structure of straw bales, stone, and geotextile fabric, in compliance with its Plan and Procedures, E&SCPs, and applicable federal and state permits.

Transco would obtain the state permits necessary to conduct hydrostatic testing and would be required to obtain Commission approval prior to using alternative hydrostatic water source or discharge locations. Hydrostatic test water would not be obtained from or discharged to any high quality surface waters unless approved by the applicable state agency.

No significant water quality impacts are anticipated as a result of discharge from hydrostatic testing. The new loops would consist of new steel pipe that would be free of chemicals or lubricant, and no additives would be used.

Withdrawal and discharge of water for hydrostatic testing could result in erosion, increased turbidity in surface waters, changes in water temperature and oxygen levels, or entrainment of aquatic species. These impacts could in turn result in injury or death to aquatic species located in close proximity at the time of active withdrawal or discharge. The withdrawal of large volumes of water from surface water sources could also temporarily affect the downstream designated recreational and biological uses of the resource if the diversions constitute a large percentage of the source's total flow or volume. By implementing the hydrostatic testing procedures summarized above and in Transco's Procedures, and obtaining and complying with required state permits, we conclude that the impacts associated with hydrostatic test water withdrawal and discharge would be minor and temporary.

We received comments related to the need for additional water allocation for dust control or revegetation purposes. If necessary, Transco plans to allocate additional water for these purposes from municipal water supplies. If Transco determines water supplies other than municipal are required, the appropriate water withdrawal permits would be obtained.

Waterbody Crossing Methods, General Impacts, and Mitigation

Waterbodies would be crossed in accordance with Transco's Procedures and state and federal permit requirements. Transco would use one of the methods described below to cross waterbodies affected by the Project. Appendix G lists the proposed crossing method for each waterbody affected by the Project.

Wet, Open Cut Method

Transco proposes to cross two waterbodies, Tobyhanna Creek at MP 61.0 and the Lehigh River at MP 65.5 along the Franklin Loop, using a wet, open cut method. At the proposed crossing locations, Tobyhanna Creek is approximately 70 feet wide and the Lehigh River is approximately 55 feet wide. At each location, Transco would construct a temporary bridge on which equipment would work, thereby reducing in-stream equipment traffic. The pipeline trench would then be excavated across each river bed to a sufficient depth to allow for 5 feet of cover over the pipelines when complete. The length of pipe necessary to accomplish each crossing

would be fabricated in nearby upland locations to again minimize in-stream work. The pipeline would then be installed and covered, streambed and banks restored, and the temporary bridge removed. Transco stated that the in-stream work would be completed within 48 hours assuming favorable conditions.

As part of its joint application to the PADEP and COE for a Pennsylvania Water Obstruction and Encroachment Permit and a CWA section 404 permit, Transco considered various dry crossing methods for each waterbody, including dam and pump or diversion flume systems and various configurations of temporary causeways and cofferdams. Each dry crossing method would require 3 to 4 weeks of in-stream construction. Site-specific hydrogeologic and hydraulic studies concluded that a 1-year storm event, even during the period when stream flows are lowest, would overtop each water control system as designed, resulting in water entering the workspace and presenting worker safety and constructability concerns. Transco also considered "trenchless" crossing methods for each waterbody including the use of HDD technology, conventional bore, and installation of a micro-tunnel. Site-specific geotechnical studies of the crossing locations identified high percentages of gravel, cobbles, and boulders along the HDD profiles and concluded that each location would pose a high risk of HDD failure and inadvertent drilling mud losses. Transco also noted that the topography around each crossing location would pose technical challenges for HDD drill entry and exit locations and pullback laydown areas. The conventional bore method would also have a high probability of failure due to the substrate materials and would require the excavation of large, deep pits on each side of each waterbody to accommodate the bore equipment. The base of the pits would be well below the bed of each waterbody and would require significant dewatering measures for the 3 to 4 weeks resulting in an increased risk of bore pit wall collapse and/or borehole misalignment. The use of the micro-tunnel method would also have a high probability of failure due to the coarse substrate at the two river crossings, and would also require the use of similarly large and deep entry and exit pits on each side of the waterbodies, raising similar feasibility and worker safety concerns as in the use of a conventional bore. We conclude that the dry crossing methods, HDD technique, conventional bore, and micro-tunnel method would be technically infeasible and/or pose an elevated worker safety concerns and we do not recommend their use at these locations.

Dry Crossing Methods

Standard Upland Construction Method – Transco would evaluate the use of standard upland construction techniques to cross dry intermittent waterbodies that are less than 10 feet wide and any stream without flow at the time of construction. When implementing this method, Transco would:

- install the pipelines with at least 5 feet of cover, unless bedrock is present;
- limit the use of equipment in the waterbody to that needed to complete the crossing;
- stockpile material excavated from the trench within the construction right-of-way and at least 10 feet from the water's edge or in ATWS, which would be located at least 50 feet from the water's edge unless otherwise approved (see appendix H);

- use material excavated from the trench as backfill unless federal or state permits specify otherwise;
- remove any excess material from the waterbody; and
- return stream bottoms to their original contours.

Transco would implement one of the following other dry crossing methods for any intermittent or ephemeral waterbodies that have the potential to carry flow during construction based on precipitation forecasts, or any other waterbody with flow at the time of construction.

Dry Pump-Around or Dry Dam and Pump Method – The pump-around/dam and pump crossing method consists of installing diversion structures that dam the waterbody and temporarily divert stream flow around construction area activities. Damming structures typically consist of one or more of the following: imported riprap, concrete jersey barriers, water bladder, port-a-dams, steel plates, and/or sand bags. The selection of the dam type or material would depend on the stream or waterbody depth, flow velocity, channel width, and type.

The pump-around/dam and pump method is initiated by installing a damming structure upstream and downstream of the trench areas. Pumps and hoses are then used to convey water flow around the in-stream work area and discharge it downstream of the construction site through an energy dissipating (or similar) device to prevent erosion and scouring and to minimize turbidity, creating a dry work area. Additional pumps are typically on standby for use in the event that a high water flow event occurs during construction. The trench is then excavated, the pipeline is installed in the dry ditch, the trench is backfilled to pre-construction contours, and the stream banks are restored prior to removing the damming structures and restoring water flow.

Dry Flumed Method – The dry flumed crossing method consists of installing flume pipe(s) over the workspace prior to trenching (or during trenching should an unforeseen event create flow) and maintaining downstream flow of the waterbody through the flume pipe(s). Equipment located on the stream banks work around the flume pipe during excavation. The pipe is then threaded under the flume pipe and the ditch backfilled. If topographic conditions do not permit the pipe to be threaded under the flume, then the flow may be temporarily pumped while the flume is pulled to lower the pipe into the ditch. Flume pipes remain in place and are maintained until restoration of the waterbody is complete, and are permanently removed as part of restoration.

The dry flumed method may be applied to intermittent waterbodies that are dry during the initial installation but may flow should an unforeseen storm event cause the waterbody to suddenly flow due to storm water runoff. Transco would use flumes that are of the size and number needed for maximum anticipated flows.

Horizontal Directional Drill Method

Transco proposes two HDDs between MPs 1778.9 and 1780.0 of the Skillman Loop to avoid Beden Brook and its associated wetlands and tributaries, and to reduce impacts on nearby

residences. The two HDDs would be drilled in opposite directions from a single workspace near MP 1779.3 to minimize the total workspace needed to accomplish the HDDs. The HDD method is described in section 1.6.2.

Conventional Bore Method

Transco would use the bore method to cross two unnamed ditches that lead to Pike Run (MPs 1782.7 and 1782.8) on the Skillman Loop. These two waterbodies are directly adjacent to a railroad track that would be crossed using the bore method; therefore, these waterbodies would also be included in the bore crossing of the railroad. The bore method is described in section 1.6.2.

General Impacts and Mitigation

Project construction could affect surface waters in several ways, and the degree of impact would depend on a number of factors including the size of the waterbody, flow at the time of crossing, and crossing method and duration. Clearing and grading of streambanks, in-stream trenching, trench dewatering, and backfilling could affect waterbodies through increased sediment loading and turbidity levels, reduced dissolved oxygen concentrations, stream warming, and introduction of chemical discharges from spills of fuels/lubricants. The Project could also impact aquatic resources including fisheries as discussed in section 2.2.3.

The greatest potential impacts of construction on surface waters would result from an increase in sediment loading and turbidity. The highest levels of sediment would be generated by use of the wet open-cut method proposed at the Lehigh River and Tobyhanna Creek crossings in Pennsylvania. The increased turbidity would be due to construction/removal of the temporary bridges, trench excavation, pipeline installation, and streambed restoration, all of which would occur within flowing water conditions at each crossing. Increased turbidity could also impact aquatic resources in proximity to the crossing locations. To minimize these impacts, Transco would complete all in-stream work within 48 hours assuming favorable conditions and during state-specified construction windows. By limiting the duration of in-stream construction, implementing other measures outlined in Transco's Procedures, and complying with state-designated construction windows, we conclude that impacts associated with the open cut crossings of the Lehigh River and Tobyhanna Creek would be minor, temporary, and limited primarily to the area of the crossings. Transco has included the proposed open cuts in its joint application to the COE and PADEP.

Where the flume or dam and pump methods are used, temporary construction-related impacts would be limited primarily to short periods of increased turbidity before installation of the pipeline, during the installation of the upstream and downstream dams, and following installation of the pipeline when the dams are pulled and flow across the restored work area is re-established. Following installation of pipelines using either wet or dry crossing methods, stream banks and riparian areas would be re-contoured and stabilized. Banks would be stabilized with approved seed mixes.

Two intermittent waterbodies (SS-009-001 and SS-009-002) are within the proposed workspace for one of the contractor staging areas (CSA/CY/PYFR-04) and would be temporarily

impacted by Project activities. No waterbodies were identified within the proposed workspace at the aboveground facilities, including compressor stations, MLVs, and M&R stations.

Transco identified areas where it would locate ATWS within 50 feet of a waterbody and provided justification for each workspace (see appendix H). Transco would implement the measures in its Project-specific Procedures to control erosion and avoid or minimize other impacts that could result from the use of the ATWS. We have determined that Transco's proposed locations of ATWS within 50 feet of a waterbody listed in appendix H are justified.

Transco also proposed to modify the requirement of our Procedures to place all spoil from minor and intermediate waterbody crossings in the construction right-of-way at least 10 feet from the water's edge, or in ATWS. Transco stated it would store spoil within 10 feet of waterbodies where the workspace is limited due to topographic constraints and adjacent features; however, Transco has not identified the specific waterbodies where it would place spoil, nor provided site-specific justification for each waterbody that would be affected. Therefore, **we recommend that:**

- **Prior to construction, Transco should revise its procedures consistent with the FERC staff's Procedures at section V.B.4.a; and**

- **Prior to construction, Transco should file with the Secretary, for review and written approval by the Director of the Office of Energy Projects (OEP), a complete list of areas by milepost where Transco would place spoil within 10 feet from the edge of a waterbody and site-specific justification for each location.**

During construction, clearing and grading of vegetation cover could increase erosion along stream banks. Alteration of the natural drainage or compaction of soils by heavy equipment near stream banks during construction may accelerate erosion of the banks and the transportation of sediment carried by overland flow into the waterbodies. The extent of the impact would depend on sediment loads, stream velocity, turbulence, stream bank composition, and sediment particle size. To minimize these impacts, equipment bridges and equipment pads would be used. To the extent possible, at least 15 feet of vegetation would be preserved along the stream banks at the pipeline crossings. ATWS for spoil storage and pipe staging would typically be set back from the bank and temporary sediment barriers would be installed around disturbed areas in accordance with Transco's Project-specific Procedures and E&SCPs. Upon completion of construction, Transco would restore and properly armor the stream banks to prevent erosion and washouts.

We received comments regarding measures Transco would implement to control erosion and sedimentation of waterbodies during excessive rain events or in more vulnerable areas such as steep slopes. In addition to ongoing erosion and sediment controls during normal storm events as outlined in Transco's Project-specific Plan and Procedures and E&SCPs, Transco would implement the following contingency measures in the event of a severe storm event:

- local weather stations would be monitored for anticipated storm events;

- supplemental erosion and sediment control devices would be stockpiled in the vicinity of sensitive areas so that they are readily available, if needed;

- additional crews and EIs would be deployed to implement the contingency plan and conduct inspection and cleanup activities;

- equipment and supplies would be removed from flood-prone areas within the designated floodways and 100-year floodplain during severe rain events; and

- equipment mats and temporary construction bridges would be secured to prevent movement during rain events.

Riparian cover on affected stream banks would be expected to recover over several months to several years. Once construction is complete, streambeds and banks would be quickly restored to preconstruction conditions to the fullest extent possible. Adherence to Transco's E&SCPs would also maximize the potential for regrowth of riparian vegetation, thereby minimizing the potential for any long-term impacts associated with lack of shade and cover. In addition, restoration of forested riparian buffers along waterbodies would be completed in accordance with all applicable state and federal permit authorizations. A strip of riparian vegetation at least 25 feet wide adjacent to waterbodies would typically be allowed to revegetate to pre-construction condition over the entire width of the right-of-way except for a 10-foot-wide strip centered over the pipeline that may be maintained in an herbaceous state. In addition, trees would not be allowed to grow within 15 feet of the pipeline.

Transco has developed a SPCC Plan that describes measures to prevent and, if necessary, control any inadvertent spill of hazardous materials that could impact soil or water quality. The SPCC Plan would be updated with site-specific information prior to the initiation of construction activities. Transco's Plan and Procedures includes protective measures for the storage and handling of chemicals and fueling activities during construction within 100 feet from wetlands and waterbodies. Transco provides site-specific justification for utilizing ATWS within 50 feet of wetlands (see appendices H and J).

Because the waterbody crossings would be completed in accordance with the construction and restoration methods described above, Transco's Procedures and E&SCPs, and any site-specific measures that may be required by state permitting agencies or the COE, we conclude that impacts on waterbodies would be minor and temporary.

2.2.3 Fisheries Resources

Existing Fisheries Resources

Fisheries of Special Concern

In New Jersey, freshwaters are classified as Freshwater 1 (not subject to any man-made wastewater discharges) and Freshwater 2 waters (all other freshwaters except Pinelands waters). For the purposes of preventing degradation of waterbodies, New Jersey has further designated waters as Category One Waters (C1) and Category Two Waters (C2). C1 waters are protected from any measurable change in water quality because of their exceptional ecological

significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources. C2 waters consist of all other waters not designated as C1 or Outstanding National Resource Waters, which includes Freshwater 1-designated waters. All 46 waterbodies crossed by the Project are designated as Freshwater 2, Non-trout, C2 waters. No C1 waters would be crossed. The "non-trout" designation generally applies to freshwaters that are not suitable for trout production or maintenance because of their physical, chemical, or biological characteristics.

In addition, in New Jersey the amount of clearing in the riparian zone adjacent to surface waters is regulated according to the Flood Hazard Area Control Act Rules in New Jersey Administrative Code (NJAC) 7:13 (NJAC, 2011a). The width of the riparian zone adjacent to a waterbody is determined by the characteristics of that regulated water. The riparian zone is 300 feet wide along both sides of any C1 waters, and any upstream tributaries within the same watershed. The riparian zone is 150 feet wide along both sides of waters that are not C1, but are trout production waters (and waters upstream), trout maintenance waters (and upstream waters and tributaries within 1 linear mile), waters that contain documented threatened or endangered species habitat (and upstream waters and tributaries within 1 linear mile), and waters that flow through an area that contains acid producing soils. All other regulated waters have a 50 foot wide riparian zone on either side.

In Pennsylvania, the Project would cross 31 waterbodies supporting coldwater fisheries. Pennsylvania also affords special protections to high quality or exceptional value waterbodies and may designate waters to be managed for trout. The Project would cross 21 high quality-designated waterbodies, 7 exceptional value waterbodies, and two Wild Trout-designated waterbodies. No Class A Wild Trout streams would be crossed by the Project.

There are no waters designated as Essential Fish Habitat within the vicinity of the pipeline loops and aboveground facilities in New Jersey or Pennsylvania, or the aboveground facilities in North Carolina, Virginia, or Maryland. Therefore, we conclude that the Project would have no impact on Essential Fish Habitat.

Fisheries of special concern crossed by the Project are identified in table 2.2.3-1.

General Impacts and Mitigation

Construction impacts on fishery resources may include: direct contact by construction equipment with fish, fish eggs, and other aquatic organisms including fish prey and forage species; alteration or removal of adjacent riparian vegetation and aquatic habitat cover; introduction of pollutants; and impingement or entrainment of fish and other biota associated with the use of water pumps, including appropriation of hydrostatic test water. Loss of riparian vegetation in forested areas could affect fish populations that may be present downstream of construction activities by reducing shade and cover and increasing water temperature. Construction could also delay migrating fish from reaching upstream spawning areas or delay downstream movement of juveniles.

TABLE 2.2.3-1

Fisheries of Special Concern Crossed by the Project

State/Facility	Milepost	Waterbody	Fisheries Concern [a]	Timing Restriction (No in-stream work allowed)
New Jersey				
Skillman Loop	1776.9	Unnamed Tributary to Stony Brook	FW2-NT	10/1 – 4/1 [b]
	1777.0	Unnamed Tributary to Stony Brook	FW2-NT	10/1 – 4/1 [b]
	1777.8	Unnamed Tributary to Stony Brook	FW2-NT	10/1 – 4/1 [b]
	1777.9	Unnamed Tributary to Stony Brook	FW2-NT	10/1 – 4/1 [b]
	1778.1	Unnamed Tributary to Stony Brook	FW2-NT	10/1 – 4/1 [b]
	1778.3	Unnamed Tributary to Beden Brook	FW2-NT	10/1 – 4/1 [b]
	1778.4	Unnamed Tributary to Beden Brook	FW2-NT	10/1 – 4/1 [b]
	1778.7	Unnamed Tributary to Beden Brook	FW2-NT	10/1 – 4/1 [b]
	1779.0	Unnamed Tributary to Beden Brook	FW2-NT	10/1 – 4/1 [c]
	1779.0	Cherry Run	FW2-NT	10/1 – 4/1 [c]
	1779.0	Cherry Run	FW2-NT	10/1 – 4/1 [c]
	1779.7	Beden Brook	FW2-NT	10/1 – 4/1 [c]
	1780.3	Rock Brook	FW2-NT	10/1 – 4/1 [b]
	1780.4	Unnamed Tributary to Rock Brook	FW2-NT	10/1 – 4/1 [b]
	1781.1	Back Brook	FW2-NT	10/1 – 4/1 [b]
	1782.1	Unnamed Tributary to Pike Run	FW2-NT	10/1 – 4/1 [b]
	1782.4	Unnamed Tributary to Pike Run	FW2-NT	10/1 – 4/1 [b]
	1782.7	Ditch to Pike Run	FW2-NT	10/1 – 4/1 [b]
	1782.8	Ditch to Pike Run	FW2-NT	10/1 – 4/1 [b]
Pleasant Run Loop	N/A [d]	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	0.4	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	0.7	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	0.7	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	1.1	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	1.2	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	1.4	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	1.7	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	1.8	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	1.8	Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	2.1	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	2.3	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	2.8	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	3.0	Pleasant Run [e]	FW2-NT	10/1 – 4/1 [b]
	3.2	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	3.3	Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	3.6	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	4.2	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	4.2	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	4.5	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.0	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.1	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.1	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.3	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.4	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.6	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.7	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	5.8	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
	6.2	Unnamed Tributary to Pleasant Run [e]	FW2-NT	10/1 – 4/1 [b]
	6.2	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]

TABLE 2.2.3-1

Fisheries of Special Concern Crossed by the Project

State/Facility	Milepost	Waterbody	Fisheries Concern [a]	Timing Restriction (No in-stream work allowed)
	6.5	Unnamed Tributary to Pleasant Run	FW2-NT	10/1 – 4/1 [b]
Pennsylvania				
Franklin Loop	58.4	Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	58.7	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	58.6	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	58.8	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.2	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.4	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.5	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.6	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.6	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.6	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.6	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	59.6	Unnamed Tributary to Tunkhannock Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	60.1	Unnamed Tributary to Tobyhanna Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	61.0	Tobyhanna Creek	HQ-CWF, MF	10/1 – 12/31 [f]
	62.3	Unnamed Tributary to Two Mile Run	HQ-CWF, MF	10/1 – 12/31 [f]
	63.1	Two Mile Run	HQ-CWF, MF	10/1 – 12/31 [f]
	63.2	Unnamed Tributary to Two Mile Run	HQ-CWF, MF	10/1 – 12/31 [f]
	63.7	Stony Run	HQ-CWF, MF	10/1 – 12/31 [f]
	65.0	Unnamed Tributary to Lehigh River	EV, MF	10/1 – 12/31 [f]
	65.5	Lehigh River	EV, MF/WTS	10/1 – 12/31 [f]
	65.9	Unnamed Tributary to Lehigh River	EV, MF	10/1 – 12/31 [f]
	66.7	Unnamed Tributary to Kendall Creek	EV, MF	10/1 – 12/31 [f]
	66.7	Unnamed Tributary to Kendall Creek	EV, MF	10/1 – 12/31 [f]
	67.2	Kendall Creek	EV, MF/WTS	10/1 – 12/31 [f]
	67.4	Kendall Creek	EV, MF/WTS	10/1 – 12/31 [f]
	67.6	Unnamed Tributary to Kendall Creek	EV, MF	10/1 – 12/31 [f]
	67.8	Unnamed Tributary to Kendall Creek	EV, MF	10/1 – 12/31 [f]
	67.9	Unnamed Tributary to Stony Run	HQ-CWF, MF	10/1 – 12/31 [f]
	67.9	Unnamed Tributary to Stony Run	HQ-CWF, MF	10/1 – 12/31 [f]
	N/A	Unnamed Tributary to Stony Run	HQ-CWF, MF	10/1 – 12/31 [f]
	68.2	Unnamed Tributary to Stony Run	HQ-CWF, MF	10/1 – 12/31 [f]
	68.9	Unknown	HQ-CWF, MF	10/1 – 12/31 [f]
	69.0	Unknown	HQ-CWF, MF	10/1 – 12/31 [f]
Dorrance Loop	18.4	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	18.7	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	18.7	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	18.8	Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	18.9	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	19.1	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	19.5	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	20.8	Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	21.8	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]
	22.4	Unnamed Tributary to Little Wapwallopen Creek	CWF, MF	10/1 – 12/31 [f]

TABLE 2.2.3-1

Fisheries of Special Concern Crossed by the Project

State/Facility	Milepost	Waterbody	Fisheries Concern [a]	Timing Restriction (No in-stream work allowed)

[a] **Pennsylvania**
CWF = Cold Water Fishery
MF = Migratory Fishery
HQ-CWF = High Quality, Cold Water Fishery
EV = Exceptional Value Waterbody
New Jersey
FW2-NT = Freshwater, Non-trout Fishery

[b] Timing restriction in accordance with Transco's Procedures.

[c] Waterbody would be crossed by the HDD.

[d] NA = waterbody crossed by access road, not pipeline loop.

[e] Riparian zone vegetation disturbance only; no direct waterbody impact.

[f] Timing restriction confirmed through consultation with PAFBC.

The greatest potential impacts of construction on fishery resources would result from an increase in sediment loading and turbidity within and immediately downstream of the construction work area including an inadvertent drilling mud release, downstream scour associated with diverting water around the work area, or discharge of hydrostatic test water. Increased levels of sedimentation could adversely affect fish eggs and juvenile fish survival, benthic community diversity and health, and spawning habitat. The highest levels of sediment would be generated by use of the wet open cut method at the Lehigh River and Tobyhanna Creek crossings. However, as discussed in section 2.2.2, Transco would complete all in-stream work, including the wet open cuts, within 48 hours assuming favorable conditions and during state-specified construction windows, and would also implement other measures outlined in its Procedures to reduce sedimentation and enhance restoration. Therefore, we conclude that impacts on fisheries associated with waterbody crossings would be minor, temporary, and limited primarily to the area of the crossings.

Long-term impacts on fishery resources could occur if the stream contours are permanently modified in the area of the crossing or the adjacent riparian vegetation does not recover. Transco proposes to reduce effects on fishery resources through the use of the various waterbody crossing methods and restoration procedures described in section 2.2.2 and by minimizing the duration of in-stream work in accordance with its Procedures. Section 2.2.2 also describes the procedures that Transco would implement during hydrostatic test water withdrawal and discharge to minimize sedimentation and turbidity. Specifically, Transco would screen the intake hoses to avoid the uptake of organic debris and entrapment of aquatic species during water withdrawal. Transco would comply with appropriate agency requirements that consider the protection of fisheries resources on a case-by-case basis. Discharges would comply with regulatory permit conditions and would be controlled to prevent scour and excessive sedimentation.

Based on the existing subsurface geologic formations present in the Project area, Transco does not anticipate that blasting would be required at any waterbody crossing. However, if conditions are encountered that warrant the use of controlled blasting, Transco would implement its Blasting Plan that outlines proper precautions to be implemented to minimize potential impacts. In addition, Transco would acquire the appropriate federal, state, and local permits prior to the use of blasting.

Impacts on fisheries would be reduced further by limiting in-stream work to the time periods required by federal and state agencies (table 2.2.3-1). For waterbodies that do not have a specific timing restriction, Transco would adhere to the in-stream construction timing restrictions included in its Procedures (measure V.B.1) We find that implementing these timing restrictions would minimize impacts on fish species in the Project area.

Construction of the New Jersey facilities would disturb regulated riparian zone. Under the Flood Hazard Area Control Act, removal of forested vegetation is considered a permanent impact and is subject to mitigation. Transco has received its Letter of Interpretation from the NJDEP confirming riparian impacts associated with construction of the Pleasant Run Loop and is awaiting NJDEP issuance of the Letter of Interpretation for the Skillman Loop. As a result, consultation with the NJDEP is ongoing and riparian zone mitigation in New Jersey is currently pending. Any proposed mitigation in New Jersey would be reviewed during the NJDEP's permit review process. Section 2.2.4 discusses riparian zone mitigation that would be accomplished at offsite locations.

We expect streambeds and banks to quickly revert to preconstruction conditions. Transco's commitment to conduct restoration, bank stabilization, and revegetation efforts in accordance with its Procedures, E&SCPs, and all applicable state and federal permits would minimize the potential for erosion from the surrounding landscape. Transco's adherence to its E&SCPs would also maximize the potential for regrowth of riparian vegetation, thereby minimizing the potential for any long-term impacts associated with lack of shade and cover. All temporary work areas would be restored and allowed to revegetate to original conditions. No long-term impacts are anticipated after restoration of stream bottoms and regrowth of stream bank and aquatic vegetation. In the event that vegetation maintenance during operation would be required along specific streambanks, impacts on fisheries would be minor. By implementing the above measures, we find that Project-related impacts on fisheries would be minimized.

2.2.4 Wetlands

Existing Wetland Resources

Wetlands in the Project area are regulated at the federal and state levels. In New Jersey, the EPA has delegated CWA section 404 program authority to the NJDEP, but retains oversight authority of the program in cooperation with the state, and the COE retains section 10 permitting authority throughout the state. The COE retains full section 404 and section 10 permitting authority in Pennsylvania. Section 401 of the CWA requires that proposed dredge and fill activities under section 404 be reviewed and certified by the designated state agency so that the Project would meet state water quality standards. The designated state agencies in New Jersey and Pennsylvania are the NJDEP and PADEP, respectively.

Transco conducted field delineations of wetlands that would be crossed by the Project in New Jersey using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (Federal Interagency Committee for Wetland Delineation, 1989), and in Pennsylvania using the COE's Wetlands Delineation Manual (COE, 1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (COE,

2009). Wetlands were classified as described in Cowardin et al., (1979). The basic wetland types that were delineated in the Project area are discussed below.

Palustrine Forested Wetlands

Palustrine forested wetlands crossed by the Project in New Jersey and Pennsylvania are characterized by woody vegetation that is 6 meters (approximately 18 feet) tall or taller and normally include an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer.

Palustrine Scrub-Shrub Wetlands

Palustrine scrub-shrub wetlands crossed by the Project in New Jersey and Pennsylvania are generally dominated by woody vegetation less than 6 meters (approximately 18 feet) tall. Scrub-shrub land types may represent a successional stage leading to a forested wetland and include shrubs, young trees, and trees or shrubs that are small and/or stunted due to environmental conditions.

Palustrine Emergent Wetlands

Palustrine emergent wetlands crossed by the Project in New Jersey and Pennsylvania are characterized by erect, rooted, herbaceous hydrophytes not including mosses and lichens. Emergent wetlands typically are found to be dominated by low-growing sedges, rushes, and other herbaceous vegetation.

Vernal Pools

Vernal pools are characterized by seasonally fluctuating water levels and may dry out completely in the summer. Many vernal pools are small, shaded, and unvegetated, and the pond bottoms are covered in dead leaves and algae. These areas can provide critical breeding habitat for several species of amphibians and are also an important habitat for many species of birds, mammals, reptiles, and invertebrates.

Stakeholders in the Princeton Ridge area raised concern that vernal pools in the area would be impacted by the project. Transco conducted surveys of wetlands and waterbodies in the Princeton Ridge area, including vernal pools, and identified one vernal pool located approximately 25 feet outside of the construction workspace.

Wetland Crossing Methods, General Impacts, and Mitigation

Crossing Methods

Wetlands would be crossed in accordance with Transco's Procedures, E&SCPs, and state and federal permit requirements. Transco would use various methods to cross wetlands depending on site-specific conditions present during construction, as described below.

Unsaturated Wetlands – In unsaturated wetlands where the soils are non-saturated and able to support construction equipment at the time of crossing, Transco would use standard upland construction techniques as described in section 1.6.1. In general, the existing vegetation would first be cut to the ground level. Tree stumps would not be removed from the wetland with the exception of those directly over the trench line; Transco would grind the stumps to surface level and leave the existing root systems in place. Debris would be removed from the wetland and stockpiled within an upland area of the right-of-way for disposal. Next, topsoil would be segregated in the wetland. Pipe stringing and fabrication may occur within the wetland adjacent to the trench or adjacent to the wetland in a designated ATWS. Following trenching and lowering the pipeline into the trench, wide track bulldozers or backhoes supported on timber mats would conduct backfilling, grading, and final cleanup.

Saturated or Unstable Wetlands – In wetlands where the soils are saturated or otherwise unable to support mainline construction equipment and the right-of-way, equipment would need to be stabilized during construction. Clearing activities would be similar to those described for unsaturated wetlands and limited to only that necessary to install the pipeline. Transco would conduct construction similar to that in unsaturated wetlands; however, topsoil segregation would not be possible because of saturation. Prior to crossing and movement of construction equipment through these wetlands, Transco proposes to stabilize the right-of-way using timber mats to allow for a safe working condition.

Standing Water Wetlands – The push/pull method would be used as an alternative wetland crossing method, or if specifically required through agency consultations, to cross large wetland areas where sufficient water is present for floating the pipeline in the trench, and grade elevation over the length of the push-pull area would not require damming to maintain adequate water levels for pipe floatation. Crossing of a wetland using the push/pull method involves stringing and welding the pipeline in designated areas outside the boundary of the wetland. Transco would excavate the wetland using backhoes supported by equipment mats. The prefabricated pipeline segment would be installed within the wetland by attaching floats or buoys to the pipe segment and pulling or pushing the pipeline segment across the water-filled trench. This process is known as "floating" the pipeline segment into place. After the pipeline segment is correctly positioned, Transco would remove the floats allowing the pipeline to eventually sink to the bottom of the excavated trench with the aid of concrete coating or concrete set-on weights to achieve negative buoyancy. Transco would then backfill the excavated trench with backhoes working off of equipment mats.

General Impacts and Mitigation

Table 2.2.4-1 summarizes the Project acreage impacts on wetlands. More detailed information is included in appendix I.

Construction of the Project would impact 26.5 acres of wetlands, consisting of 15.1 acres of emergent wetland, 2.9 acres of scrub-shrub wetland, and 8.5 acres of forested wetlands. Of the 8.5 acres of forested wetland impacts, 4.3 acres would be permanently impacted during operation and would be converted to emergent or scrub-shrub wetland types due to vegetation maintenance requirements along the pipeline loops.

TABLE 2.2.4-1

Summary of Wetland Impacts Associated with the Project (acres)

	Emergent Wetland		Scrub-shrub Wetland		Forested Wetland	
State/Facility	Con [a]	Op [b]	Con	Op	Con	Op
New Jersey						
Skillman Loop	3.4	1.0	<0.1	<0.1	0.1	0.1
Access Roads	<0.1	0.0	0.0	0.0	0.0	0.0
Pleasant Run Loop	2.0	0.7	0.0	0.0	0.2	0.1
Access Roads	<0.1	0.0	0.0	0.0	0.0	0.0
Pennsylvania						
Franklin Loop	6.6	1.3	2.9	0.0	8.0	4.0
Access Roads	0.0	0.0	0.0	0.0	0.0	0.0
Dorrance Loop	3.1	0.3	0.0	0.0	0.3	<0.1
Access Roads	0.0	0.0	0.0	0.0	0.0	0.0
Project Total	**15.1**	**3.3**	**2.9**	**<0.1**	**8.5**	**4.3**

[a] Con = Construction Impacts. Includes impacts associated with all areas within the construction workspace limits. This includes the total of the existing pipeline right-of-way, new permanent right-of-way, ATWS areas, and contractor staging.

[b] Op = Operational Impacts. Includes impacts associated with the new permanent right-of-way located outside of the existing and currently maintained pipeline right-of-way.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

The primary impact of the Project on wetlands would be the alteration of wetland value due to vegetation clearing. Construction could also impact water quality within the wetland due to sediment loading or inadvertent spills of fuel or chemicals. The use of heavy equipment within wetlands could also result in the compaction of wetland soils. Impacts on wetlands would be greatest during and immediately following construction. The majority of these effects would be short term in nature and would cease shortly after the wetlands are restored and vegetated. Following revegetation, the wetland would eventually transition back into a community with functionality similar to that of the pre-construction state. In emergent wetlands, the herbaceous vegetation would regenerate quickly (typically within 1 to 3 years).

Following revegetation, there would be no permanent impact on emergent wetland vegetation in the maintained pipeline right-of-way because these areas naturally consist of, and would remain as, open land and herbaceous communities. In addition, all scrub-shrub wetlands would be allowed to revert to scrub-shrub wetlands after construction. Revegetation would be considered successful if the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction.

The duration of the impact on scrub-shrub and forested wetlands would be longer than that of emergent wetlands. Forested wetlands located outside of the permanent right-of-way would be allowed to revert to forested wetlands after construction. In these areas, woody vegetation may take several years to regenerate, resulting in long term impacts. Permanent impacts on forested wetlands within the new proposed right-of-way would be based on a 25-foot new permanent right-of-way width, where the wetland would be converted to scrub-shrub or emergent. For the permanent right-of-way, the re-establishment of mature woody vegetation would be precluded by the annual maintenance of a 10-foot-wide herbaceous strip centered over the pipeline and the cutting of woody vegetation within 15 feet of the pipeline centerline. This

would result in a permanent conversion of previously forested wetland areas to non-forested wetland areas. The conversion from one vegetation cover type to another could result in changes in wetland functions and values by altering the amount of sunlight or other environmental conditions in the wetland, affecting wildlife habitat. In general, however, it is expected that the affected wetlands would continue to provide important ecological functions such as sediment/toxicant retention, nutrient removal, flood attenuation, groundwater recharge/discharge, and wildlife habitat.

In general, Transco would minimize wetland impacts by collocating the proposed loops with Transco's existing pipelines for approximately 29.6 of 29.8 miles (99 percent of their lengths). In addition to the measures identified in crossing methods discussion above, Transco would implement the following measures outlined in its Procedures and E&SCPs:

- Sediment barriers would be installed across the entire construction right-of-way at all waterbody/wetland crossings, where necessary to prevent the flow of sediments into the waterbody or wetland. Where waterbodies or wetlands are adjacent to the construction right-of-way, sediment barriers would be installed along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way.

- Diversion terraces would be installed at all waterbody crossings and upslope from all wetland boundaries to prevent sediment from entering these aquatic resources.

- Trench plugs would be installed at the banks of all waterbodies and at the boundaries of all wetland crossings immediately after trench excavation to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody or wetland.

- Vegetation clearing would be limited between ATWS and the edge of the wetland to the certificated construction right-of-way. Vegetation would be cut just above ground level, leaving existing root systems in place, and trimmings would be removed from the wetland for disposal.

- The top 12 inches of topsoil would be segregated from the area disturbed by trenching in wetlands, except in areas where standing water is present or soils are saturated or frozen.

- The trench would be dewatered (either on or off the construction right-of-way) in a manner that would not cause erosion and would not result in heavily silt-laden water flowing into any waterbody or wetland. Dewatering structures would be removed as soon as possible after the completion of dewatering activities.

- Vegetation maintenance during operations would be limited in wetlands to a 10-foot-wide herbaceous corridor and the removal of trees and shrubs within 15 feet of the pipeline centerline.

In addition to the above measures, Transco would limit the width of the construction right-of-way in wetlands to 75 feet except in those areas identified in table 2.2.4-2, which includes Transco's justification for additional construction right-of-way width. We reviewed Transco's alignment sheets and other mapping and have determined that the requested construction rights-of-way are justified.

TABLE 2.2.4-2

Areas that Exceed 75 Feet of Workspace Width Within Wetlands

State/Facility	Wetland Identification	Milepost	Justification [a]	Width of Workspace within Wetland (feet)
New Jersey				
Skillman Loop	WW-002-009	1778.4	a	90
	WW-002-017	1780.2	a	90
	WW-002-018	1782.5	a	90
	WW-002-019	1782.6	a	90
Pleasant Run Loop	WW-002-027	2.6	a	90
	WW-002-028	3.0	a	90
	WW-002-031	5.4	a	90
Pennsylvania				
Franklin Loop	WW-001-014	58.9	a	90
	WW-001-016	59.0	a	90
		59.1		90
	WW-001-020	59.3	a	90
	WW-001-028	59.8	a	90
	WW-001-022	61.1	a	90
	WW-001-024	61.3	a	90
	WW-001-025	61.6	b	90
	WW-001-027	62.3	a	90
	WW-001-031	62.9	a	90
		62.9		90
		63.2		90
	WW-001-036	64.2	a	90
	WW-001-039	65.5	a	90
		65.6		90
	WW-001-040	65.9	a	90
	WW-001-041	66.8	a	90
	WW-001-047	68.1	a	90
	WW-001-050	68.5	a	90
Dorrance Loop	WW-001-005	18.8	a	90
	WW-001-009	20.9	a	90
	WW-001-011	21.6	a	90
	WW-003-004	22.3	a	90
	WW-003-008	22.8	a	90

[a] a=spoil storage in wetland to avoid unnecessary trips through wetland with heavy equipment.
b=topsoil segregation.

Transco would also locate ATWS at least 50 feet away from wetland boundaries except where site-specific conditions warrant otherwise. Transco identified areas where it would be necessary to locate ATWS within 50 feet of a wetland and provided justification for each workspace (see appendix J). These justifications include the need for additional workspace for waterbody and road crossings, steep slope construction, and others. We have determined that Transco's proposed locations of ATWS within 50 feet of a wetland are justified.

There would be no impacts on wetlands as a result of aboveground facility activities in North Carolina and Virginia. In Maryland, no permanent impacts on wetlands would occur from operation of the aboveground facilities. However, Transco has indicated that minor temporary

impacts would occur at wetlands within the workspace for the existing Potomac North Valve Site and existing valve site 190-13. Transco plans to submit permit applications to the Maryland Department of the Environment and COE for these temporary impacts in August 2014. In addition, two wetlands are within the proposed construction workspace for Compressor Station 515/MLV515LD0 and MLV505LD90; see appendix J. Transco has stated it would attempt to avoid these wetlands. If construction activities would encroach upon the wetlands, Transco would install sediment barriers to prevent spoil from entering the wetlands, and would restore the wetlands to their pre-construction contours following construction.

Wetland restoration would be conducted in accordance with Transco's Procedures and other permit conditions as may be required. Transco would conduct annual post-construction monitoring of all wetlands affected by construction to assess the condition of vegetation and the success of restoration for a period of at least 3 years. An annual monitoring report addressing the status of wetland restoration and revegetation would be submitted to the appropriate agencies. Other elements for inclusion in the annual monitoring report would be determined through consultations with COE and PADEP in conjunction with permit conditions and authorization.

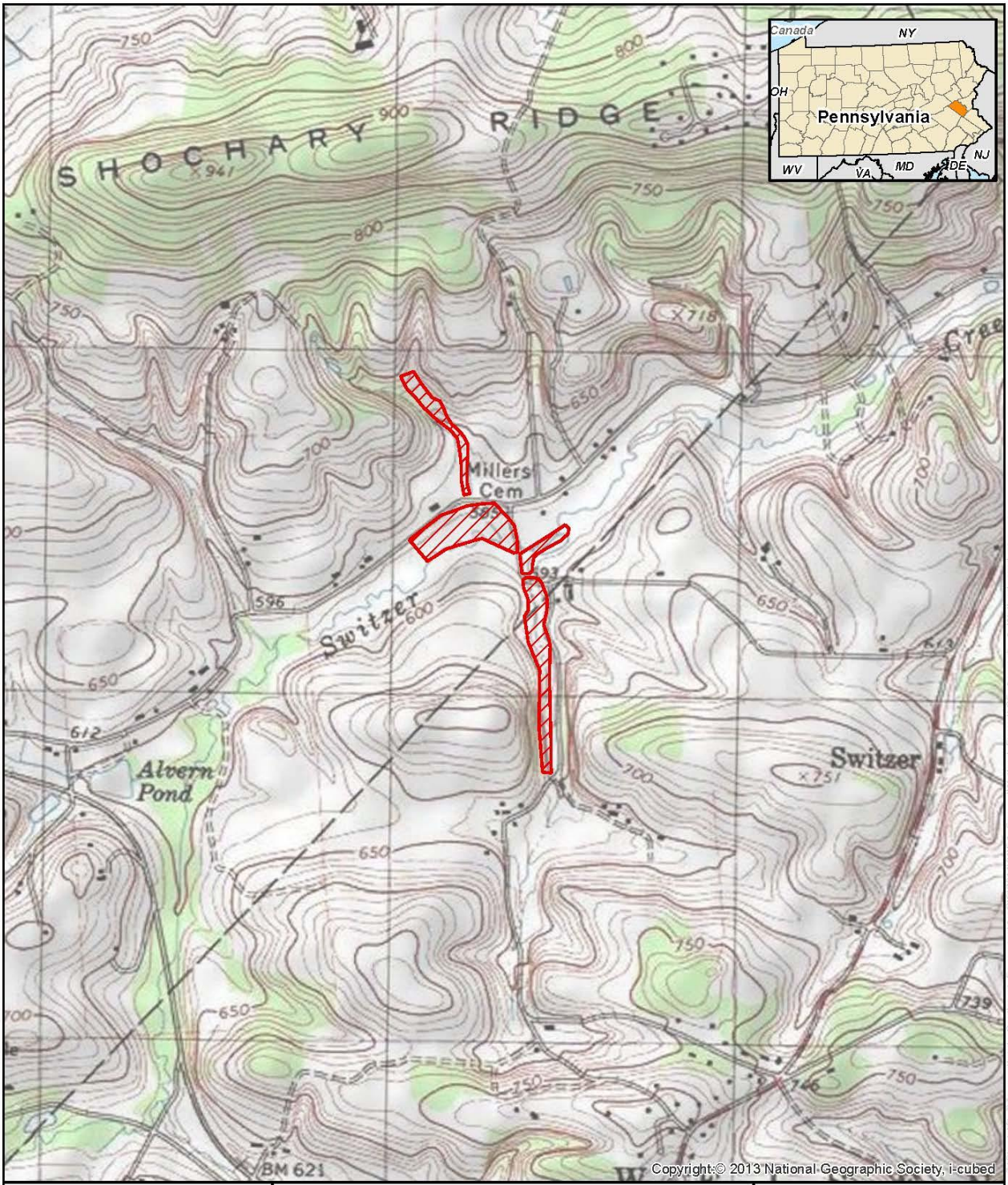
Wetland Mitigation Sites

New Jersey – Transco has received its Letter of Interpretation from the NJDEP confirming wetland and riparian impacts associated with construction of the Pleasant Run Loop and is awaiting NJDEP issuance of the Letter of Interpretation for the Skillman Loop. As a result, consultation with the NJDEP is ongoing and selection of a wetland mitigation site(s) in New Jersey is currently pending. Transco has engaged a wetland contractor to develop a site-specific wetland mitigation plan for New Jersey and anticipates that this plan would include wetland preservation and enhancement. Transco also committed to conduct all necessary surveys and federal consultations, and would obtain all required federal authorizations related to the wetland mitigation site(s).

Pennsylvania – The Bleiler Farm mitigation site (see figure 2.2.4-1) is in Lehigh County, Pennsylvania and would be entered into a Declaration of Restrictive Covenants Agreement upon COE acceptance of the proposed mitigation plan. This site includes Switzer Creek and two unnamed tributaries to Switzer Creek. A 15.2-acre portion of the site is proposed for mitigation. The proposed mitigation would consist of 4.1 acres of forested wetland enhancement, 2.9 acres of scrub-shrub wetland enhancement, and 8.2 acres of mixed emergent, scrub-shrub, and forested wetland enhancement.

Information concerning federal threatened and endangered species and cultural resources at the proposed Pennsylvania wetland mitigation site is included in sections 2.3.3 and 2.6.1, respectively.

In conclusion, we find that wetland impacts associated with the construction and operation of the Project would be minimized and compensated for by implementing the construction, restoration, and mitigation measures proposed by Transco and as may be required by the COE and state agencies. Any proposed mitigation in New Jersey would be reviewed during the NJDEP's Individual Freshwater Wetlands permit review process in accordance with NJAC 7:7A-15 in order to compensate for the loss or disturbance of freshwater wetlands or state open waters.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Leidy Southeast Expansion Project
Bleiler Farm Wetland Mitigation Site
Lehigh County, Pennsylvania
Proposed Wetland Mitigation Site

2.3 VEGETATION AND WILDLIFE

2.3.1 Vegetation

Existing Vegetation Resources

Transco identified existing vegetation resources during environmental field surveys in New Jersey according to *Classification of Vegetation Communities of New Jersey: Second Iteration* (Breden et al., 2001). Plant communities in Pennsylvania were classified according to *Terrestrial and Palustrine Plant Communities of Pennsylvania* (Fike, 1999; Sitch, 2011) as recommended by the PADCNR Natural Heritage Program. Major upland cover types affected by the Project in New Jersey and Pennsylvania include upland forest and open upland as summarized in tables 2.3.1-1 and 2.3.1-2, respectively. Wetland vegetation communities that would be affected by the Project are discussed in section 2.2.4.

TABLE 2.3.1-1

Upland Vegetation Cover Types Associated with the Project in New Jersey

Vegetation Community	General Description	Common Species
Upland forest	Oak-Hickory Forest	Forest type dominated by red oak, shagbark hickory, white oak, and black oak.
	Sugar Maple-American Beech-Basswood Forest	Forest type dominated by American beech, red maple, sugar maple, black gum, and American basswood.
Open upland	This vegetation community consists of all non-forested, non-wetland habitats including agricultural lands (which includes pastureland), grassland, shrubland, residential, and existing pipeline right-of-way.	Agriculture lands predominantly used for crop production or pasture/grazing (fallow fields) land used by cattle, and horse farms. Species commonly observed included sweet vernal grass, common vetch, Japanese stilt grass, orchard grass, fescue, Kentucky blue grass, white clover, and timothy grass. Existing pipeline rights-of-way are mowed on a regular basis to suppress woody plant growth. Plant species commonly observed included various perennial cool grass species. In residential areas the existing rights-of-way consist primarily of maintained lawns and a limited amount of scrub-shrub communities.

TABLE 2.3.1-2

Upland Vegetation Cover Types Associated with the Project in Pennsylvania

Vegetation Community	General Description	Common Species
Upland forest	Hemlock/White Pine-Northern Hardwood Forest	Dominant trees observed in this forest type include red maple, black birch, white pine, chestnut oak, and red oak.
Open upland	This vegetation community consists of all non-forested, non-wetland habitats including agricultural lands (which includes pastureland), grassland, shrubland, residential, and existing pipeline right-of-way.	Agriculture lands predominantly used for crop production or pasture/grazing (fallow fields) land used by cattle, and horse farms. Species commonly observed included orchard grass, fescue, ox-eyed daisy, and Hungarian brome, rough goldenrod, common dewberry, and sweet vernal grass. Existing pipeline rights-of-way are mowed on a regular basis to suppress woody plant growth. Plant species commonly observed included various perennial cool grass species. In residential areas the existing rights-of-way consist primarily of maintained lawns and a limited amount of scrub-shrub communities.

The pipeline facilities would cross primarily open upland vegetation cover types. This community covers about 66 percent of the pipeline routes. The remainder of the pipeline routes cross forested upland (23 percent), open wetland (3 percent), scrub-shrub wetland (0.6 percent), forested wetland (1.7 percent), and open water (0.5 percent).

Transco's proposed contractor/pipe storage yards and contractor staging areas are located mainly on open upland or are within existing commercial/industrial areas; however, approximately 12.8 acres of upland forest would be temporarily impacted by the use of these areas. Transco plans to construct 5 new access roads and modify 18 existing access roads for construction and/or operation of the Project. After construction, 8 of the 23 roads would be retained in their modified condition for future access during operation of the facilities resulting in less than 0.1 acre of permanent upland forest impact; the remaining 15 would be restored to their pre-existing condition. The proposed roads possess a variety of surface types including gravel, asphalt, dirt, and vegetation cover, and would require surface modifications, widening, and tree clearing based on the equipment that would use the road. These improvements would require minor modifications of the existing land use.

Table 2.3.1-3 summarizes the approximate acreage of upland vegetation communities that would be affected by the Project.

TABLE 2.3.1-3

Upland Vegetation Affected by the Project (acres)

Vegetation Cover Type	Pipeline Facilities [a]		Aboveground Facilities [b]		Contractor/Pipe Storage Yards/Staging Areas		Access Roads	
	Con [c]	Op [d]	Con	Op	Con	Op [e]	Con [f]	Op [g]
Upland Forest	105.2	26.8	0.0	0.3	12.8	0.0	1.1	<0.1
Open Upland	271.9	44.8	0.8	0.9	60.6	0.0	5.2	0.1
Project Total	**377.1**	**71.6**	**0.8**	**1.2**	**73.4**	**0.0**	**6.3**	**0.2**

[a] Includes pipeline loops.

[b] Acreage of vegetation impacts for aboveground facilities reflects the workspace both within and outside of the fence line for existing facilities. Operational impacts associated with the footprint of MLVs are included here; construction impacts for MLVs are included in totals for pipeline facilities.

[c] Construction acres impacted include impacts associated with all areas within the construction workspace limits. This includes the total of the existing pipeline right-of-way, new permanent pipeline right-of-way, temporary workspace areas, and additional temporary workspace areas.

[d] Operational acres impacted include impacts associated with the portion of the new permanent right-of-way located outside of the existing and currently maintained pipeline right-of-way.

[e] Areas used for contractor/pipe storage yards/staging areas would be used during construction and would then be allowed to return to pre-construction conditions; no operational impacts are anticipated.

[f] Acreage of vegetation impacts for temporary access roads associated with the pipeline loops. Construction impacts for temporary access roads associated with the aboveground facilities (including MLVs) are included in the construction impacts for the aboveground facilities.

[g] Operational impacts associated with proposed permanent access roads at MLV505LD and MLV515LD.

Con = construction; Op = operation

Construction at the existing compressor stations would occur within or immediately adjacent to the previously disturbed, graded, or graveled areas of the existing fenceline of the facilities. The only vegetation cover type that would be affected by construction of new or modifications to other existing aboveground facilities, including those in North Carolina, Virginia, and Maryland is open upland. Operation of new facilities and proposed permanent

access roads would result in a permanent conversion of about 0.4 acre of forested land to commercial/industrial use.

Vegetation Communities of Special Concern or Value

Vegetation communities of special concern include sensitive or protected vegetation types, natural areas, and unique plant communities. Based on consultation with the PADCNR and/or field surveys, Transco identified the following ecological communities identified as special concern resources along the Franklin Loop: red-spruce palustrine forest, leatherleaf sedge wetland, and low heath shrubland.

The low heath shrubland is located outside of the proposed workspace; therefore, no impacts on this community are anticipated. In a letter dated December 19, 2013, the PADCNR requested that Transco implement the following measures to protect these communities:

- minimize disturbance in areas of rare communities;
- clean construction equipment prior to working in these areas to prevent the spread of invasive plant species; and
- begin work in areas not infested with invasive plant species and work toward areas that are infested to prevent further spread, if possible.

In addition, the Skillman Loop would cross an environmentally sensitive area referred to as the Princeton Ridge between MPs 1776.8 and 1778.1. The Princeton Ridge is an ecological area in Mercer County that extends westward from the Millstone River and the Delaware and Raritan Canal State Park across the northern part of Princeton Township into Hopewell (New Jersey Conservation Foundation, 2014). The area consists of forest and wetlands that support several endangered and threatened species as well as other wildlife species. We received many comments from stakeholders in the Princeton Ridge area concerning existing vegetation, wildlife habitat, and wildlife, including special status species and migratory birds in the Princeton Ridge area and potential Project impacts on these resources. As discussed in section 2.4.5, the area of the Princeton Ridge crossed by Transco's existing pipeline and the proposed Skillman Loop was designated by the State of New Jersey as an environmentally sensitive area.

General Impacts and Mitigation

Upland Forest

The greatest impact on vegetation would be on forested areas because of the length of time required for woody vegetation to revert to its preconstruction condition. We received comments concerning potential Project-related impacts on forest habitat including fragmentation, edge effects, and increased opportunity for invasive species establishment, including from Princeton Ridge stakeholders. Construction in forest lands would remove mature trees in the construction right-of-way. In addition, the canopy overhanging the right-of-way may be trimmed as needed. Trees would be cut into lengths, chipped, and/or removed. The removal of mature trees could also result in secondary impacts such as increased erosion. Incremental fragmentation of upland forest habitat could occur due to the expansion of Transco's existing

right-of-way where the loops are not adjacent to Transco's existing pipelines in forested areas. The loss of forest habitat and the expansion of existing corridors could also decrease the quality of habitat for forest wildlife species, including alteration of habitat resulting from increased light levels into interior forest and a subsequent loss of soil moisture as a result of an expanded right-of-way, as discussed in section 2.3.2. Expansion of the existing corridor could also result in an increased opportunity for invasive plants to displace native species.

After construction, forested vegetation would be allowed to recover within the construction right-of-way and ATWS; however, the impact in these areas would be long term. A total of 26.8 acres of upland forest would be permanently impacted (i.e., converted to herbaceous cover) by operation of the Project. Permanent impacts on forest lands would occur within the maintained portion of the permanent right-of-way where ongoing vegetation maintenance during operations would preclude the re-establishment of trees. In addition, approximately 0.3 acre of forest land would be permanently removed by construction or modification of various MLVs.

Transco would minimize impacts on upland forest by utilizing existing rights-of-way or previously disturbed, non-forested areas to the extent possible. Specifically, the proposed loops would be collocated with Transco's existing pipeline for approximately 96 percent of their lengths. Transco would typically limit the width of new permanent right-of-way to 25 feet and would allow the ATWS to revert to woody vegetation. The adjacent forested land would remain available for wildlife. In addition, the proposed construction right-of-way overlaps the existing, maintained permanent right-of-way.

In forested areas where the right-of-way would be cleared for construction, Transco would implement measures outlined in its Plan, Procedures, and E&SCPs to minimize impacts on vegetation, including the installation of erosion control measures following initial disturbance of the soil. Following construction, all disturbed areas would be seeded in accordance with written recommendations for seed mixes, rates, and dates obtained from the local soil conservation authority or as requested by the landowner or land management agency. In accordance with its Plan, Transco would monitor disturbed areas to determine the post-construction revegetation success for a minimum of two growing seasons, or until revegetation is considered successful. Transco has also prepared a Noxious and Invasive Weed Control Plan in consultation with relevant agencies. The plan outlines methods to prevent, mitigate, and control the spread of noxious and invasive weeds during ground-disturbing activities associated with construction of the Project, and also includes a monitoring program that would be implemented following construction and restoration of the Project. Some of the measures in the plan include:

- flagging areas of concern (identified during May 2013 noxious weed inventory or by the EI during pre-construction review) prior to construction to alert construction personnel and prevent access into areas until noxious weed control measures have been properly implemented;

- treating known weed populations with appropriate methods (e.g., physical removal, mechanical removal, herbicide application) to prevent their spread;

- removing soil and propagules from vehicles and machinery to prevent the transport of noxious weeds to other areas; and

- monitoring for invasive species following completion of construction after the first and second growing seasons, as applicable, and in accordance with Transco's Plan.

We reviewed Transco's Noxious and Invasive Weed Control Plan and find it acceptable.

The Project would cross numerous public lands and special interest areas. State agencies with administrative authority over other public lands may require Transco to further mitigate for the loss of forested vegetation in these areas. These public lands and special interest areas are further discussed in section 2.4.5.

Due to state designation as ESA 5 and F3, and in response to stakeholder concerns, Transco developed site-specific construction and restoration plans for the Skillman Loop crossing of the Princeton Ridge area. More specifically, Transco's Rock Handling Plan describes how Transco would construct the pipeline through the area, and the PRCRP describes the restoration measures that Transco would implement in the area. These plans were developed with input from area stakeholders and are discussed in sections 1.6.2, 2.1.1, and 2.9.1. To minimize vegetation and tree clearing, Transco would limit the total construction right-of-way width to 50 feet across the Princeton Ridge, as compared to the typical 105-foot-wide construction right-of-way that would be used to construct the majority of the remaining loops. The 50-foot-wide construction right-of-way would overlap substantially with Transco's existing easement, thereby largely limiting tree removal to the edges of the existing right-of-way. As discussed in section 1.6.2, Transco would implement site-specific restoration measures in the Princeton Ridge area that includes: planting of native herbaceous and woody plants and shrubs; implementing its Princeton Ridge Noxious and Invasive Weed Control Plan; and monitoring to ensure successful revegetation. We conclude that the reduced construction right-of-way width and implementation of the Rock Handling Plan, PRCRP, and Princeton Ridge Noxious and Invasive Weed Control Plan proposed by Transco would minimize environmental impacts on vegetation and provide for adequate restoration of the right-of-way through the Princeton Ridge area.

Open Land

Open land consists of grasslands, pasture, agricultural land, shrublands, residential areas, and maintained utility rights-of-way. Approximately 0.9 acre of open land would be permanently removed by construction or modification of various MLVs. In general, the impact on remaining open land vegetation would be considered short term. After cleanup and reseeding of the right-of-way, the herbaceous components of the cover type would typically regenerate quickly considering the ample annual rainfall in the region. Aside from the permanent impacts noted above, impacts on these cover types during facility operation would be minor because these cover types would be allowed to recover and would not be significantly altered by right-of-way maintenance activities. Further discussion of potential impacts on agricultural land and residential areas is provided below.

Agricultural Land – The effects of the Project on agricultural land would be minor and short term, and include the loss of standing or row crops within the construction work area and the disruption of farming operations for the growing season during the year of construction. To

reduce these impacts, Transco would adhere to the measures outlined in its Plan and Procedures and its E&SCPs. These measures include testing the topsoil and subsoil for compaction at regular intervals in areas disturbed by construction activities; strictly controlling equipment traffic on agricultural land to minimize compaction and rutting; and plowing severely compacted soil. To preserve soil fertility in agricultural land, the entire topsoil layer (to a maximum depth of 12 inches) would be stripped from either the pipeline trench and subsoil storage area or the full construction right-of-way, as stipulated in landowner agreements, and stored separately from the subsoil for replacement after backfilling the trench. Transco would monitor crops during the first and second growing seasons after seeding to determine if additional restoration is needed.

Residential Areas – Impacts on vegetation cover in residential areas would include the removal of trees, ornamental shrubs, and maintained lawn areas within the construction right-of-way. Most of these impacts would be short term as Transco would restore the landscape in the temporary construction right-of-way immediately after construction in accordance with its Plan and E&SCPs, and in accordance with any specific requirements identified by landowners. The loss of large trees would be considered a long-term impact and may be subject to compensation through landowner negotiations. Transco would further minimize impacts in residential areas by utilizing the special construction techniques described in section 1.6.2, including the use of a reduced construction right-of-way width. Section 2.4.4 provides additional detail regarding the measures Transco would implement to minimize impacts in active residential areas. Approximately 2.3 acres of residential land would be considered permanent right-of-way for the proposed pipeline loops. Following construction, all residential areas would be restored to preconstruction conditions or as specified in written landowner agreements. Landowners would continue to have use of the right-of-way provided it does not interfere with the easement rights granted to Transco for construction and operation of the pipeline system.

Because Transco would construct most of its Project within open land where vegetation restoration timeframes would be short-term, and follow the methods discussed above and in its Plan and E&SCPs, we conclude that construction and operation of the Project would not result in a significant impact on vegetation in the Project area.

2.3.2 Wildlife

The Project would cross upland and wetland habitats that support a diversity of wildlife species. Wildlife species are directly dependent on the existing plant communities and are attracted to an area if suitable cover and/or habitat are present.

Existing Wildlife Resources

As described in the sections below, the proposed facilities would cross several distinct upland and wetland vegetation cover types. These include upland forest, open upland (grasslands, pasture, agricultural land, shrublands, residential areas, and maintained utility rights-of-way), forested wetlands, scrub-shrub wetlands, and open wetlands (emergent). Each of these cover types (i.e., vegetation communities) provides nesting, cover, and foraging habitat for a variety of wildlife species. Table 2.3.2-1 identifies the terrestrial wildlife species common to these habitats. Other cover types including open water and developed areas also provide habitat for wildlife species. Impacts on aquatic resources are described in sections 2.2.2 and 2.2.3.

TABLE 2.3.2-1

Common Wildlife Species Occurring in Major Habitat Types Traversed by the Project [a]

Common Name	Uplands			Wetlands			
	Upland Forest	Open Upland	Developed	Palustrine Forested	Palustrine Emergent	Palustrine Scrub-shrub	Open Water
MAMMALS							
Black bear	X	--	--	--	--	X	--
Gray fox	X	--	--	--	--	X	--
Raccoon	X	--	--	--	--	--	--
Gray squirrel	X	--	--	--	--	--	--
Eastern chipmunk	X	--	--	--	--	--	--
Southern flying squirrel	X	--	--	--	--	--	--
Porcupine	X	--	--	--	--	--	--
Opossum	X	--	--	--	--	--	--
Bat	X	--	--	--	--	--	--
White-tailed deer	X	X	--	--	--	X	--
Woodchuck	--	X	--	--	--	--	--
Eastern cottontail	--	X	--	--	--	X	--
Meadow jumping mouse	--	X	--	--	--	--	--
Meadow vole	--	X	--	--	--	--	--
White-footed mouse	--	X	--	--	--	X	--
Coyotes	--	X		--	--	--	--
Red fox	--	X	--	--	--	X	--
Beaver	--	--	--	X	X	X	X
Muskrat	--	--	--	X	X	X	X
Mink	--	--	--	X	X	X	X
BIRDS							
Eastern wood-pewee	X	--	--	--	--	--	--
Ovenbird	X	--	--	--	--	--	--
Song sparrow	X	--	--	--	--	--	--
Grey catbird	X	--	--	--	--	--	--
Common yellowthroat	--	--	--	X	X	--	--
Barn swallow	--	X	--	--	--	--	--
Red-winged blackbird	--	--	--	X	X	--	--
Olive-sided flycatcher [b]	X	--	--	X	--	X	--
Brown-headed cowbird	X	--	--	--	--	--	--
Pileated woodpecker	X	--	--	--	--	--	--
Wood thrush [b]	X	--	--	--	--	--	--
Golden winged warbler [b]	X	--	--	X	--	X	--
Prairie warbler [b]	X	X	--	--	--	--	--
Wild turkey	X	X	--	--	--	--	--
Ruffed grouse	X	--	--	--	--	--	--
Barred owl	X	--	--	--	--	--	--
Great-horned owl	X	--	--	--	--	--	--
Eastern screech owl	X	--	--	--	--	--	--
European starling	--	X	X	--	--	--	--
Rock dove	--	X	X	--	--	--	--
AMPHIBIANS							
Green frog	--	--	--	X	X	--	X
Bullfrog	--	--	--	X	X	--	X

TABLE 2.3.2-1

Common Wildlife Species Occurring in Major Habitat Types Traversed by the Project [a]

Common Name	Uplands			Wetlands			Open Water
	Upland Forest	Open Upland	Developed	Palustrine Forested	Palustrine Emergent	Palustrine Scrub-shrub	
Northern dusky salamander	--	--	--	X	X	--	X
Redback salamander	--	--	--	X	X	--	X
Leopard frog	--	--	--	X	X	--	X
Spring peeper	--	--	--	X	X	--	X
Eastern newt	X	--	--	--	--	--	X
REPTILES							
Northern water snake	--	--	--	X	X	X	X
Painted turtle	--	--	--	X	X	--	X
Northern bog turtle	--	--	--	X	X	X	X
Snapping turtle	--	--	--	X	X	--	X
Wood turtle	X	--	--	--	--	X	--
Timber rattlesnake	X	--	--	--	--	--	--
Northern ring neck snake	X	--	--	--	--	--	--
Eastern box turtle	X	--	--	--	--	--	--
Common garter snake	X	X	X	X	X	--	X

[a] Modifications at the existing compressor stations, M&R stations, and MLV sites would occur within the facility fenceline or existing maintained permanent right-of-way adjacent to the facility and are not expected to require tree clearing. Construction and operation of new MLVs would be installed along the pipeline loops at new locations within Transco's construction and permanent right-of-way, respectively; and would result in a permanent land use conversion to commercial/industrial. Wildlife found at the facilities would be similar to those identified under the open upland and developed habitat type included in this table.

[b] Bird of Conservation Concern (refer to section 2.3.3).

Sources: FWS, 2008; New Jersey Division of Fish and Wildlife Endangered and Nongame Species Program, 2014b; Pennsylvania Herp Identification Online Guide to Reptiles and Amphibians, 2008.

Upland Forest

The upland forests in the Project area provide moderate to high quality habitat for a variety of mammals, birds, amphibians, reptiles, and invertebrates. The predominance of oak is an important habitat component in upland forests in the Project area. Some mammals rely directly on oak mast as a food source, while amphibians and invertebrates rely on the soil chemistry of an oak forest. Predatory species, such as raptors, red fox, and timber rattlesnake, are also attracted to oak-dominated forests and their edges due to the abundance and diversity of prey species. The tree and shrub layers provide food and cover for birds and larger mammals, such as white-tailed deer. Detritus on the forest floor provides food and cover for invertebrates, amphibians, reptiles, and smaller mammals, such as woodchuck and eastern chipmunk.

Open Land

This cover type category covers all non-forested vegetation, including grasslands, pasture, agricultural land, shrublands, residential areas, and maintained utility rights-of-way. Although row crops generally provide poor to moderate cover habitat, they often provide forage for a number of species. Pastures also provide grazing habitat for species such as white-tailed deer. Hayfields, small grains, fallow and old fields, pastures, and idled croplands provide

nesting habitats for grassland-nesting birds (USDA, 1999). On landscapes where intensive row crop agriculture is the dominant land use, these strip habitats are extremely important for grassland birds and other wildlife. Grassland birds rely on open fields for nesting and foraging. Rights-of-way for utility lines maintained in early successional communities provide valuable nesting and foraging habitats for grassland bird species (USDA, 1999). Grasslands and old fields can be utilized as foraging and denning habitat by mammals and also provide nesting and breeding habitat to upland game birds such as pheasants. Shrublands provide sources of food and nesting sites for various birds, as well as cover for invertebrates, reptiles, and amphibians. Open fields and shrub cover provide habitat for small mammal species such as mice, rabbits, and voles, which make them prime hunting grounds for predator species such as foxes, coyotes, and raptors.

Developed Areas

Developed lands in the Project area consist of land uses classified as industrial/commercial, and road crossings. These types of lands tend to provide minimal habitat for wildlife species. Wildlife diversity is often limited to species that are adapted to human presence and the associated anthropogenic changes to the landscape, such as paved and landscaped areas.

Wetlands

Forested wetlands are dominated by woody vegetation and provide a diverse assemblage of vegetation and an abundance of food and water sources for wildlife. The forested wetland canopy is typically dominated by red maple, which is a highly desirable wildlife browse. Mammals such as mink, muskrat, raccoon, and white-tailed deer use these areas as foraging habitat. Many waterfowl and wading birds use forested wetlands adjacent to scrub-shrub and emergent wetlands for nesting and foraging. Forested wetland communities are also important habitats for reptiles and amphibians including the American bullfrog, green frog, and various salamander species.

Emergent wetlands provide important habitat for waterfowl, muskrats, herons, frogs, and salamanders. Bird species such as red wing blackbird and grey catbird also utilize emergent wetland habitat.

Scrub-shrub wetlands provide cover for invertebrates, reptiles, and amphibians. Scrub-shrub cover provides habitat for small mammal species such as mice and rabbits, which make them prime hunting grounds for predator species.

Open Water

The open water cover type includes the creeks, streams, and rivers crossed by the Project. In addition to the aquatic resources discussed in sections 2.2.2 and 2.2.3, the open water cover type provides important foraging and breeding habitat for various terrestrial species including waterfowl, reptiles, amphibians, and some mammals.

General Impacts and Mitigation

Potential impacts on wildlife from the Project include the temporary displacement of wildlife from the right-of-way. It is expected that most wildlife, such as birds and larger mammals, would temporarily relocate to adjacent available habitat as construction activities approach. Construction could result in the mortality of less mobile animals such as small rodents, reptiles, amphibians, and invertebrates, which may be unable to escape the immediate construction area. Displacement impacts would be minor and short term as wildlife would be expected to return and colonize post-construction habitats.

Project construction would require clearing of vegetation from the right-of-way, temporarily decreasing the amount of wildlife habitat and reducing protective cover and foraging habitat in the immediate Project area. Depending on the season, construction could also disrupt bird courting or nesting, including destruction of nests, eggs, and chicks within the construction work area. However, this would be a short-term impact (except along the permanently maintained pipeline right-of-way) as all habitats would be allowed to reestablish in temporary construction workspace and ATWS, thus remaining available for wildlife habitat and watershed functions.

The impact of forest fragmentation on wildlife in the eastern United States has emerged as an important issue. Fragmentation generally affects birds through dispersal barriers, absence of suitable microhabitats, small population size, and edge effects (Degraaf and Healy, 1990). Migratory birds are among the best-studied groups of wildlife regarding adverse effects from fragmentation. Edge effects can result in interactions between birds that nest in the interior of forests and species that inhabit surrounding landscape, typically lowering the reproductive success of the interior species. Other evidence suggests that certain mammals, amphibians, reptiles, and plants are also adversely affected by forest fragmentation. Species that require large tracts of unbroken forest land may be forced to seek suitable habitat elsewhere. The loss of forest habitat, expansion of existing corridors, and the creation of open early successional and induced edge habitats could decrease the quality of habitat for forest interior wildlife species in a corridor much wider than the actual cleared right-of-way. The distance an edge effect extends into a woodland is variable, but most studies point to at least 300 feet (Rodewald, 2001; Jones, et al., 2000; Ontario Ministry of Natural Resources, 2000; Robbins, 1988; Rosenberg, et al., 1999). Edge impacts within this distance could include a change in available habitat for some species due to an increase in light and temperature levels on the forest floor and the subsequent reduction in soil moisture; thereby resulting in habitat that would no longer be suitable for species that require these specific habitat conditions, such as salamanders and amphibians. An alteration of habitat could affect the fitness of some species and increase competition both within and between species, possibly resulting in an overall change to the structure of the forest community.

The majority of the proposed pipeline loops are collocated with Transco's existing, maintained right-of-way, which would reduce fragmentation effects. During operation, previously forested habitat (including forested wetlands) would not be allowed to reestablish within the permanent right-of-way for the proposed pipeline loops. The principal impact would be a shift from those species favoring forest habitat to those using either edge habitat or areas that are more open. It is not likely that the relatively small widening (approximately 25 feet) of existing permanently cleared right-of-way would impede the movement of most forest interior

species. The impact of the permanent conversion of forested habitat to non-forested habitat would be minimized by installing the majority of the proposed loops adjacent to Transco's existing right-of-way, which is maintained in an herbaceous state. As previously discussed, the Project would permanently convert about 26.8 acres of forested land to herbaceous cover. In addition, operation of new facilities and proposed permanent access roads would result in a permanent conversion of about 0.4 acre of forested land to commercial/industrial use. We conclude that the overall impact of permanent forest conversion on wildlife would be minor due to the aforementioned collocation and the large expanse of forested land available in the Project area.

The degree of construction-related impacts on wildlife that inhabit wetlands would depend on the particular species and the time of year of construction. Highly mobile species, such as beavers, mink, muskrat, and birds would likely vacate the area during construction. Amphibians and reptiles have lower mobility and hibernate in soft wetland soil. Some limited mortality to these species is likely unavoidable; however, the silt-fence barrier erosion control device, erected and maintained to reduce erosion, would also keep these species along with small mammals out of the active work area in wetland areas.

Modifications at the existing compressor stations, M&R stations, and MLV sites would largely occur within the facilities' fenceline or existing maintained permanent right-of-way adjacent to the facility and are not expected to require tree clearing. Wildlife found at the facilities would be similar to those identified under the open upland and developed habitat type included in table 2.3.2-1.

In conclusion, construction and operation of the Project would result in short- and long-term impacts on wildlife and wildlife habitat. These impacts are expected to be minor given the mobile nature of most wildlife in the area, the availability of similar habitat adjacent to and near the Project, and the compatible nature of the restored right-of-way with species occurring in the area. These impacts would be minimized by collocating the proposed loops to a large extent with Transco's existing maintained right-of-way, and by implementing the restoration methods outlined in Transco's Plan, Procedures, and E&SCPs, and other site-specific plans including Transco's Rock Handling Plan and PRCRP for the Princeton Ridge area.

2.3.3 Protected Species

Migratory Birds

Migratory birds are species that nest in the United States during the summer and make short or long-distance migrations for the non-breeding season. Neotropical migrants migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Protection Act (MBTA) (16 USC 703-711). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, or nests unless authorized under a FWS permit. Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668-668d). Executive Order 13186 (66 Federal Register 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse

impacts on migratory birds through enhanced collaboration with the FWS. The Executive Order states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and that particular focus should be given to addressing population-level impacts.

On March 30, 2011, the FWS and the Commission entered into a *Memorandum of Understanding Between the Federal Energy Regulatory Commission and the U.S. Department of the Interior United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds"* that focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary agreement does not waive legal requirements under the MBTA, BGEPA, ESA, Federal Power Act, NGA, or any other statutes and does not authorize the take of migratory birds.

A variety of migratory bird species, including songbirds, raptors, and waterfowl utilize the habitat found within the Project area. The FWS established Birds of Conservation Concern (BCC) lists for various regions in the country in response to the 1988 amendment to the Fish and Wildlife Conservation Act, which mandated the FWS to identify migratory nongame birds that, without additional conservation actions, were likely to become candidates for listing under the ESA. The BCC lists, last updated in 2008, are divided by regions. There are 29 total species included on the BCC list for the Bird Conservation Regions crossed by the Project (Bird Conservation Regions 28 and 29) (see table 2.3.3-1).

The potential impacts of the Project on migratory birds, including BCC-listed birds, would include the temporary and permanent loss of habitat associated with the removal of existing vegetation. The greatest potential to impact migratory birds would occur if Project construction activities such as grading, tree clearing, and construction noise take place during the nesting season. This could result in the destruction of nests and mortality of eggs and young birds that have not yet fledged. Construction would also reduce the amount of habitat available for resources such as foraging and predator protection for migratory birds and would temporarily displace birds into adjacent habitats, which could increase the competition for food and other resources. This in turn could increase stress, susceptibility to predation, and negatively impact reproductive success. The temporary loss of approximately 105.2 acres of upland forest and 4.3 acres of forested wetlands associated with the pipeline facilities (see tables 2.2.4-1 and 2.3.1-3) would present a long-term impact for migratory birds that depend on forest. Noise and other construction activities could affect courtship and breeding activities including nesting and the rearing of young. Clearing and grading would also temporarily remove nesting and foraging habitat and could destroy occupied nests resulting in the mortality of eggs and young, unfledged birds, if these activities are done during the nesting season.

Migratory birds, including BCC-listed birds, could also be affected during Project operation, which would permanently convert approximately 26.8 acres of upland forest land and 4.3 acres of forested wetland to an herbaceous state. The reduction in available forest habitat could result in increased competition, a potential increase in parasitic bird species, edge effects (as previously discussed in section 2.3.2), and ongoing disturbances associated with periodic mowing and other right-of-way maintenance activities.

TABLE 2.3.3-1

Birds of Conservation Concern Potentially Occurring Within the Project Area

Species	Primary Breeding Habitat, (Secondary Breeding Habitat)	Potentially Impacted Habitat Types within Project Right-of-Way
Bachman's sparrow	Open Pine Forest	Open Pine Forest
Bald eagle	Forest (Riparian)	Forest (Riparian)
Bewick's wren	Open Woodlands (Riparian)	Forest (Riparian)
Black rail	Coastal Salt and Brackish Marshes	None
Black-capped chickadee	Forests (Open Woodlands)	Forest (Riparian)
Blue-winged warbler	Abandoned Fields, Swamp/Wetlands	Forest (Riparian)
Brown-headed nuthatch	Mature Pine Stands	Forest (Riparian)
Canada warbler	Mixed Deciduous-Coniferous Woodlands	Forest (Riparian)
Cerulean warbler	Mature Upland Oak Woods (Wooded Hillsides along Streams and Rivers)	Mature Upland Oak Woods (Wooded Hillsides along Streams and Rivers)
Golden-winged warbler	Abandoned Fields with Small Saplings (Forest Edge)	Abandoned Fields with Small Saplings (Forest Edge)
Henslow's sparrow	Ephemeral Grasslands	Ephemeral Grasslands
Kentucky warbler	Deciduous Woods of Floodplains, Swamps, and Ravines	Deciduous Woods of Floodplains, Swamps, and Ravines
Loggerhead shrike	Pasture and Cropland with Scattered Trees and Hedgerows	Pasture and Cropland with Scattered Trees and Hedgerows
Louisiana waterthrush	Wooded Ravines and Mountain Brooks	Wooded Ravines and Mountain Brooks
Northern saw-whet owl	Woodlands with Dense Undergrowth of Conifers or Shrubs	Woodlands with Dense Undergrowth of Conifers or Shrubs
Olive-sided flycatcher	Conifer Forest	Conifer Forest
Peregrine falcon	Cliffs or man-made structures (Riparian)	Cliffs or man-made structures (Riparian)
Prairie warbler	Old Fields/Pastures with Young Trees	Old Fields/Pastures with Young Trees
Red crossbill	Mature Coniferous Forests	Mature Coniferous Forests
Red-headed woodpecker	Open Woodlands with Scattered Trees	Open Woodlands with Scattered Trees
Rusty blackbird	Wet Forest	NB
Sedge wren	Moist Upland Sedge Meadow	NB
Short-eared owl	Field Stubble/Grasslands	NB
Swainson's warbler	Bottomland Forests (Cove Hardwoods with Dense Deciduous Understory)	Bottomland Forests (Cove Hardwoods with Dense Deciduous Understory)
Upland sandpiper	Agricultural Lands (Dry Grasslands)	Agricultural Lands (Dry Grasslands)
Whip-poor-will	Open Woodlands	Open Woodlands
Wood thrush	Moist, Lowland Deciduous Forest	Moist, Lowland Deciduous Forest
Worm-eating warbler	Woodlands with Dense Understory	Woodlands with Dense Understory
Yellow-bellied sapsucker	Northern Hardwood Forests	Northern Hardwood Forests

[a] NB = This species is non-breeding in the bird conservation regions crossed by the Project (Regions 28 and 29).

Federal and state agencies were also consulted to identify sensitive wildlife habitats and wildlife managed lands that could be affected by the Project. The Franklin Loop would cross the Pocono Lake Preserve Important Bird Area in Monroe County, Pennsylvania. This is a 42,296-acre area that is largely comprised of deciduous forest and forested wetlands, with smaller areas of mixed and evergreen forest, open water, and scrub-shrub habitat. This area provides breeding habitat to a number of forest interior, mountain, northern, and conifer species, including the black-billed cuckoo, yellowbellied sapsucker, northern saw-whet owl, alder flycatcher, red-breasted nuthatch, golden-crowned kinglet, Swainson's thrush (possible); warblers including

goldenwinged (possible), Nashville, magnolia, yellow-rumped, black-throated blue (probable), black-throated green, blackburnian (probable), worm-eating (possible), Canada and northern waterthrush; white-throated sparrow, dark-eyed junco, and purple finch (Brauning, 1992). The Franklin Loop crosses a total of 20.5 acres of forest habitat within the Pocono Lake Preserve Important Bird Area, of which 5.8 acres would be permanently impacted (i.e., converted to herbaceous cover) by the operation of the Project. The remaining 14.7 acres would be allowed to recover within the construction right-of-way and ATWS; however, the impact in these areas would be long term.

We received comments from stakeholders in the Princeton Ridge area regarding impacts on migratory bird habitat. To minimize vegetation and tree clearing, Transco would limit the total construction right-of-way width to 50 feet across the Princeton Ridge, as compared to the typical 105-foot-wide construction right-of-way that would be used to construct the majority of the remaining loops. The 50-foot-wide construction right-of-way would overlap substantially with Transco's existing easement, thereby largely limiting tree removal to a narrow strip on the edges of the existing right-of-way.

In addition, Transco filed a draft Migratory Bird Habitat Restoration Plan as part of its application that includes conservation measures to avoid and minimize impacts on migratory birds. Some of the measures in the plan include:

- locating roads, fences, lay down areas, staging areas, and other infrastructure in or immediately adjacent to previously disturbed areas to the greatest extent possible to reduce habitat fragmentation;

- conducting vegetation clearing activities outside of the migratory bird breeding windows identified by the FWS;

- implementing the restoration measures included in Transco's Plan and Procedures to ensure that areas disturbed by construction are successfully revegetated; and

- conducting routine vegetation clearing for operation and maintenance purposes outside of the migratory bird breeding windows.

As noted above, Transco has agreed to adopt the FWS-recommended vegetation clearing windows during construction. The New Jersey Field Office of the FWS recommended that Transco conduct vegetation clearing between August 1 and March 14, and the Pennsylvania Field Office of the FWS recommended vegetation clearing between September 1 and March 31. The New Jersey Field Office of the FWS provided Transco with comments on the draft Migratory Bird Habitat Restoration Plan in an e-mail dated December 3, 2013. Transco indicated in its January 31, 2014 supplemental filing that it has addressed these comments. In addition, Transco conducted surveys in New Jersey prior to leaf-off in spring 2014 in areas where tree cutting would occur to determine the presence of any raptor nests that would be impacted by the Project; these surveys also included a subset of other breeding birds. Transco stated that one red-tailed hawk nest was identified on the edge of the construction right-of-way during this survey, the report of which will be provided to the New Jersey Field Office of the FWS in August 2014. Although the Pennsylvania Field Office of the FWS has not provided

specific comments on the draft Migratory Bird Habitat Restoration Plan, the draft plan incorporates the Adaptive Management Practices for Conserving Migratory Birds, provided to Transco by the Pennsylvania Field Office of the FWS in a letter dated March 19, 2013. Transco stated that it will file a final Migratory Bird Habitat Restoration Plan with the New Jersey and Pennsylvania Field Offices of the FWS in August 2014. Therefore, **we recommend that:**

- **Transco should not begin construction of the Project <u>until</u>:**

  a. Transco files the final Migratory Bird Habitat Restoration Plan with the New Jersey and Pennsylvania Field Offices of the FWS and the Secretary; and

  b. Transco files with the Secretary all FWS comments on the final Migratory Bird Habitat Restoration Plan.

The Project largely involves looping and modifications to existing facilities, thus minimizing land and vegetation disturbance, permanent habitat alteration, and fragmentation. Restoration would be conducted in accordance with Transco's Plan, Procedures, and E&SCPs, and PRCRP, which we find acceptable, in addition to other agency requirements. As such, we conclude that the loss of forest habitat would not result in population-level impacts on migratory birds in the region. Based on Transco's commitment to conduct vegetation clearing within the FWS-recommended timeframes, implementation of our recommendations above, and considering that the Project would involve an incremental expansion of an existing right-of-way, we conclude that impact on migratory birds (including BCC-listed species) would be minimal and effects on their habitat would be minimized.

Federal Threatened and Endangered Species

Federal agencies are required under Section 7 of the ESA, as amended, to ensure that any actions authorized, funded, or carried out by the agency would not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. As the lead federal agency authorizing the Project, the FERC is required to consult with the FWS and/or NOAA Fisheries to determine whether federally listed endangered or threatened species or designated critical habitat are found in the vicinity of the Project, and to evaluate the proposed action's potential effects on those species or critical habitats.

For actions involving major construction activities with the potential to affect listed species or designated critical habitat, the lead federal agency must report its findings to the FWS and/or NOAA Fisheries in a Biological Assessment for those species that may be affected. If it is determined that the action is likely to adversely affect a listed species, the federal agency must submit a request for formal consultation to comply with Section 7 of the ESA. In response, the FWS and/or NOAA Fisheries would issue a Biological Opinion as to whether the federal action would jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of designated critical habitat.

Transco, acting as the FERC's non-federal representative for the purpose of complying with Section 7(a)(2) of the ESA, initiated informal consultation with the New Jersey and Pennsylvania Field Offices of the FWS on February 8, 2013 and November 27, 2012, respectively, regarding federally listed threatened or endangered species potentially occurring in or near the Project area. The FWS identified four federally listed threatened or endangered species (bog turtle, Indiana bat, northeastern bulrush, and dwarf wedge mussel), one species proposed for federal listing (northern myotis or long-eared bat), and one other federally protected species (bald eagle) under its jurisdiction that are known to occur in the Project area. These species, their protection status, and their potential location in the Project area are summarized in table 2.3.3-2 and discussed below. Our informal Section 7 consultation and conference with the FWS is ongoing. Thus to comply with Section 7 of the ESA, we are requesting that the FWS consider this EA as our Biological Assessment for the Project.

TABLE 2.3.3-2

Federally Listed Species Known or Potentially Occurring Within the Project Area

		Pipeline Facilities					
Species	Federal Status [a]	Skillman Loop (NJ)	Pleasant Run Loop (NJ)	Franklin Loop (PA)	Dorrance Loop (PA)	Aboveground Facilities	Determination [b]
Bog Turtle	T	X	X	X	--	--	NLAA
Indiana Bat	E	X	X	X	X	X	NLAA
Northeastern bulrush	E	--	--	X	--	X	NE
Dwarf wedgemussel	E	--	--	X	--	--	NE
Northern Long-eared bat	P	X	X	X	X	X	NLAA

[a] Status Key
T = Threatened
E = Endangered
P = Proposed for Listing

[b] NLAA = Not Likely to Adversely Affect
NE = No Effect

Species Under FWS Jurisdiction

Bog Turtle – The federally threatened bog turtle is the smallest native North American freshwater turtle, with average sizes (adult carapace length) ranging from 3.2 to 3.9 inches (Carr, 1952). Bog turtles generally occupy open-canopy herbaceous sedge meadows, unpolluted emergent and scrub/shrub wetlands, sphagnum bogs, and fens bordered by wooded areas (FWS, 2010).

The New Jersey and Pennsylvania Field Offices of the FWS respectively indicated that the proposed Pleasant Run Loop and Franklin Loop are within the known range of the bog turtle and requested Phase I habitat surveys of all wetlands crossed by these loops. Although the bog turtle is also known to occur in the counties crossed by the Skillman Loop in New Jersey, the New Jersey Field Office of the FWS confirmed that Phase I surveys for the bog turtle would not be required for the Skillman Loop (FWS, 2013).

Transco completed Phase I bog turtle surveys of the Pleasant Run Loop during May and June 2013 in accordance with FWS protocols, and did not identify any wetlands possessing the characteristics of potential habitat for the bog turtle. In an e-mail dated December 12, 2013, the New Jersey Field Office of the FWS concurred with Transco's findings that bog turtle habitat is not present along the Skillman and Pleasant Run Loops.

Transco completed Phase I bog turtle surveys of the Franklin Loop in Pennsylvania in May and June 2013 in accordance with FWS protocols, and identified eight wetlands within the proposed construction work area as having potential habitat for bog turtles (WW-001-014, WW-001-016, WW-001-019, WW-001-020, WW-001-021, WW-001-028, WW-001-036, and WW-001-037). Transco stated that it recently completed Phase II and Phase III surveys of these wetlands at the request of the FWS and did not identify any occupied wetlands. Transco plans to file the survey reports with the FERC and FWS upon their completion in the summer of 2014.

Section 7 consultation will not be concluded until the Pennsylvania Field Office of the FWS reviews the Phase II and Phase III survey reports and concurs with our determination in writing. Therefore, **we recommend that:**

- **Transco <u>should not begin construction of the Franklin Loop until</u>:**

  a. Transco files the results of the Phase II and Phase III bog turtle survey with the Pennsylvania Field Office of the FWS and the Secretary;

  b. the FERC staff completes any necessary Section 7 ESA consultation with the FWS; and

  c. Transco receives written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.

By implementing our recommendation, we conclude the Project is *not likely to adversely affect* the bog turtle.

<u>Indiana Bat</u> – The federally endangered Indiana bat is relatively small, with a wingspan of 9 to 11 inches. Indiana bats hibernate during winter in caves or abandoned mines from October through April. For hibernation, they require cool, humid caves with stable temperatures, under 50 degrees Fahrenheit (°F) but above freezing. The hibernacula typically contain large numbers of bats and often have large rooms and vertical or extensive passages.

When active, the Indiana bat roosts in dead trees, dying trees, or live trees with exfoliating bark. During the summer months, most reproductive females occupy roost sites that receive direct sunlight for more than half the day. Roost trees are generally found within canopy gaps in a forest, fence line, or along a wooded edge. Maternity roosts are found in riparian zones, bottomland and floodplain habitats, wooded wetlands, as well as upland communities. Indiana bats forage in semi-open to closed forested habitats, forest edges, and riparian areas (FWS, 2007).

In a letter dated March 19, 2013, the Pennsylvania Field Office of the FWS recommended that Transco restrict tree clearing between April 1 and November 15 in Pennsylvania to avoid direct impacts on the Indiana bat. This restriction applies to trees that are greater than or equal to 5 inches in diameter at breast height. The FWS also recommended that Transco retain shagbark hickory trees, dead and dying trees, and large diameter trees (greater than 12 inches diameter at breast height) to serve as roost trees for bats; and retain forested riparian corridors and forested wetland, where possible.

In an e-mail dated March 25, 2013, the New Jersey Field Office of the FWS recommended that Transco restrict tree clearing between April 1 and September 30 in New Jersey to avoid direct impacts on the Indiana bat. Transco has agreed to the tree clearing timing restrictions recommended by the New Jersey and Pennsylvania Field Offices of the FWS. In addition, Transco filed a draft Indiana Bat Conservation Plan as part of its application that includes conservation measures aimed at avoiding and minimizing impacts on the Indiana bat. Some of the measures in the plan include:

- conducting vegetation surveys prior to construction to identify suitable bat foraging and roosting habitat, and avoiding and minimizing impacts on suitable trees in these areas;

- retaining a minimum buffer of at least 50 feet on each side of streams or wetlands crossed by temporary workspace; and

- providing for the short and long-term habitat needs of the Indiana bat by offsetting the effect of forest habitat loss that will result from the project by contributing to the Indiana Bat Conservation Fund.

Transco is planning to file a final Indiana Bat Conservation Plan with the Commission and the New Jersey and Pennsylvania Field Offices of the FWS in August 2014. Section 7 consultation will not be concluded until the FWS reviews and concurs with the Final Indiana Bat Conservation Plan in writing. Therefore, **we recommend that:**

- **Transco <u>should not begin construction of the Project until</u>:**

  a. Transco files the final Indiana Bat Conservation Plan with the New Jersey and Pennsylvania Field Offices of the FWS and the Secretary;

  b. the FERC staff completes any necessary Section 7 ESA consultation with the FWS; and

  c. Transco receives written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.

By implementing our recommendation and Transco's commitments identified above, we believe the Project is *not likely to adversely affect* the Indiana bat.

Northeastern Bulrush – The federally endangered northeastern bulrush is an obligate wetland plant found in small wetlands, sinkhole ponds, beaver ponds, or wet depressions with seasonally fluctuating water levels. In an e-mail dated April 30, 2014, the Pennsylvania Office of the FWS concluded that, because the Project would be located over 5 miles from a known site, the Project would have *no effect* on the northeastern bulrush. We agree with this determination.

Dwarf wedge mussel – The dwarf wedge mussel inhabits creek and river areas with a slow to moderate current and a sand, gravel, or muddy bottom. Documented populations in Pennsylvania are located in the upper Delaware River (Wayne and Pike Counties). In an e-mail dated April 30, 2014, the Pennsylvania Office of the FWS concluded that, because the Project would not cross the Delaware River, the Project would have *no effect* on the dwarf wedge mussel. We agree with this determination.

Blanket Authorizations for Modification of Aboveground Facilities

Transco obtained a blanket authorization from the Asheville Field Office (North Carolina) of the FWS for activities associated with modifications to existing aboveground facilities. The Asheville Field Office blanket authorization provides FWS concurrence that construction, maintenance, or miscellaneous rearrangement of facilities within existing rights-of-way or previously disturbed sites would not affect listed species. Transco also obtained a blanket authorization from the Virginia Field Office of the FWS providing concurrence that activities associated with modifications to existing aboveground facilities would not affect listed species. Due to the lack of suitable habitat within the facility boundaries and adjacent maintained right-of-way, we agree with this finding and consider ESA consultation complete in North Carolina and Virginia. Aboveground facility modifications in Maryland would also involve minor work largely within maintained facility fencelines or adjacent rights-of-way. Therefore, we have determined that the aboveground facilities in Maryland would have *no effect* on listed species and ESA consultation is complete for these facilities.

Federally Proposed Species

On October 2, 2013, the FWS proposed the northern long-eared bat for listing as endangered under the ESA, with a final rule anticipated no later than April 2, 2015. The northern long-eared bat is a medium-sized bat species that is characterized by its medium to dark brown fur on its back, dark brown ears and wing membranes, and tawny- to pale-brown fur on the ventral side. The range includes New Jersey, New York, and Pennsylvania.

The northern long-eared bat predominantly overwinters in hibernacula that include caves and abandoned mines. During the summer, this species typically roosts singly or in colonies underneath bark or in cavities or crevices of both live trees and snags. Northern long-eared bats are also known to roost in human-made structures such as buildings, barns, sheds, and under eaves of windows. Threats to the northern long-eared bat include disease due to the emergence of white-nose syndrome, improper closure at hibernacula, degradation and destruction of summer habitat, and use of pesticides. If northern long-eared bats are present, tree clearing could potentially kill, injure, or disturb breeding or roosting bats. Northern long-eared bats could also be impacted by the loss of tree habitat if significant amounts of tree clearing were to occur.

In an e-mail dated December 2, 2013, the New Jersey Office of the FWS indicated that the Skillman Loop transects a northern long-eared bat maternity colony, and the Pleasant Run Loop is approximately 2 miles from a documented northern long-eared bat hibernaculum. Because the northern long-eared bat may be listed close to the approximate starting date of construction of the Project, the FWS has recommended that Transco implement the Northern Long-eared Bat Interim Conference and Planning Guidance for this species. Transco has agreed to comply with the Interim Guidance, which includes tree clearing restrictions. Transco continues to consult with the FWS to develop and implement appropriate avoidance and mitigation measures. We believe that the Project is *not likely to jeopardize* the northern long-eared bat; however, we anticipate some adverse effects due to tree clearing. Therefore, we are requesting Section 7 conference for this species. **We further recommend that:**

- **Transco <u>should not begin construction of the Project until</u>:**

    a. the FERC staff completes any necessary Section 7 ESA conference with the FWS regarding the northern long-eared bat and any subsequent consultation, if necessary; and

    b. Transco receives written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.

Bald and Golden Eagle Protection Act

The bald eagle is a large bird of prey whose range covers virtually all of North America. Although no longer federally listed under the ESA, the bald eagle is protected under the BGEPA and the MBTA. The BGEPA and MBTA prohibit killing, selling, or harming eagles or their nests, and the BGEPA also protect eagles from disturbances that may injure them, decrease productivity, or cause nest abandonment.

Optimal roosting, foraging, and breeding habitats for the bald eagle include areas near waterbodies, such as lakes, rivers, and forested wetlands. Bald eagles typically prefer large trees for roosting and nesting. Bald eagles can be sensitive to human activity and disturbance and may abandon otherwise suitable habitat if disturbance is persistent (Fraser et al., 1985). The FWS identified one known bald eagle nest approximately 2 miles from the Franklin Loop where it intersects the Lehigh River. Transco conducted aerial helicopter surveys for raptor nests along the pipeline loops within an approximate 0.25-mile-wide corridor. No raptor nests were observed during the aerial survey.

Wetland Mitigation Parcels

In New Jersey, Transco has initiated but not completed wetland permitting through the NJDEP and, thus, wetland mitigation sites, if necessary, have not been identified. In Pennsylvania, Transco would enhance and preserve a site in Lehigh County as mitigation for wetland impacts associated with the Project (see section 2.2.4). Transco reviewed the Pennsylvania Natural Diversity Inventory to identify federal and state-listed species that may be present at the proposed mitigation site. The Pennsylvania Natural Diversity Inventory response issued on September 13, 2013 indicated that no impacts on federal or state-listed species is

anticipated at the site. However, additional consultation with the FWS identified potential bog turtle habitat within the proposed mitigation site. Transco stated that a Phase II bog turtle survey was recently completed at this location and that no occupied wetlands were identified. Transco plans to file the results with the FERC and FWS in the summer of 2014. Therefore, **we recommend that:**

- **Transco should not begin offsite mitigation activities in New Jersey or Pennsylvania until:**

  a. Transco files the results of the Phase II bog turtle survey at the proposed wetland mitigation site in Lehigh County with the Pennsylvania Field Office of the FWS and the Secretary;

  b. Transco reviews any proposed wetland mitigation sites in New Jersey for federally listed threatened and endangered species and, if necessary, conducts surveys for identified species in accordance with FWS requirements, and files the results of these reviews and surveys with the New Jersey Field Office of the FWS and the Secretary; and

  c. the FERC staff completes any necessary Section 7 ESA consultation with the FWS.

State Threatened and Endangered Species

New Jersey and Pennsylvania have regulatory requirements for state-listed species. In New Jersey, the New Jersey Natural Heritage Program (NJNHP), the Endangered and Nongame Species Program, and the Division of Land Use Regulation are responsible for administering the state endangered species laws. In Pennsylvania, three agencies are responsible for protecting threatened and endangered species: 1) the Pennsylvania Game Commission (PAGC) has jurisdiction over state-listed birds and mammals; 2) the Pennsylvania Fish and Boat Commission (PAFBC) monitors state-listed fish, reptiles, amphibians, and aquatic organisms; and 3) the PADCNR has jurisdiction over state-listed plants, natural communities, terrestrial invertebrates, and geological features.

The Project activities associated with modifications to the aboveground facilities located in North Carolina, Virginia, and Maryland would occur primarily within previously disturbed and maintained areas at the existing facility sites. Therefore, construction and operation of the Project in North Carolina, Virginia, and Maryland would not significantly impact wildlife, including state listed rare species.

A discussion of agency consultation, survey results, and proposed mitigation for state-listed species potentially occurring in the Project area is provided below and is summarized in table 2.3.3-2.

New Jersey

Transco's consultations with the NJNHP and FWS identified 23 threatened, endangered, special concern, and rare species under NJDEP jurisdiction that may occur near the Project facilities in New Jersey. These species included 13 birds, 1 mammal, 2 reptiles, and 7 plants. Of

these, one is also a federally protected species (bald eagle), which is discussed earlier in this section. A summary of surveys and/or proposed mitigation for the remaining species is discussed below and summarized in table 2.3.3-3.

The bobcat is found in the northern hardwood forests of New Jersey. Bobcats den in crevices in rocks, under fallen logs, in thick tangles of vegetation, or under the root mass of a fallen tree. Today the bobcat, though classified as endangered, appears to be fairly well-established in the northern hardwood forests of the state, perhaps even more widespread than many think. Their elusive nature makes them a challenge to study (NJDEP, 2014). Because bobcats range widely and are adept at avoiding humans, impacts on bobcat as a result of construction activities are expected to be minimal and mitigated by the species behavioral response to avoid the area. Following construction, it is expected that bobcat use of the right-of-way for foraging and travel would immediately resume.

The wood turtle resides in both aquatic and terrestrial environments, unlike other turtle species that favor either land or water. Aquatic habitats are required for mating, feeding, and hibernation, while terrestrial habitats are used for egg laying and foraging. Freshwater streams, brooks, creeks, or rivers that are relatively remote provide the habitat needed by these turtles (NJDEP, 2014). The NJNHP identified portions of the Skillman Loop as containing potential wood turtle habitat. NJDEP provided the following best management practices for the wood turtle in a letter dated September 25, 2013:

- in-stream work should not be conducted between November 1 and April 1. In addition, minimize any stream flow change during this time to avoid impacts on hibernating turtles;
- for construction in non-waterbody areas (especially critical in areas located between 0 and 250 meters from a stream edge) between March 15 and November 15, employ a qualified herpetologist to review and clear the work area of turtles prior to initiating activities and erect temporary fencing in areas where turtles are present to keep turtles out of the work area;
- non-waterbody construction is permitted from December 1 to March 1 at any distance from the stream; and
- for non-waterbody work conducted between November 16 and November 30 or between March 1 and March 14, that is less than 10 meters from a wood turtle stream, employ a qualified herpetologist to review and clear the work area of turtles prior to initiating activities and erect temporary fencing in areas where turtles are present to keep turtles out of the work area.

Transco performed surveys for wood turtle habitat in September 2013 and identified potential habitat on both the Skillman and Pleasant Run Loops. Transco submitted the wood turtle survey report to the NJDEP in December 2013 and continues to consult with the NJDEP to develop and implement appropriate avoidance and mitigation measures for these species.

TABLE 2.3.3-3

State-Listed Threatened and Endangered Species Identified in the Vicinity of the Project

Species Name	State Status	Habitat	Project Component	Field Survey Results	Seasonal Timing Restrictions or Proposed Mitigation
New Jersey Species					
Bobcat [a]	Endangered	Mixture of open areas, shrubland and expansive forests.	Skillman Loop	No field surveys are planned.	Best Management Practices
Wood Turtle [a]	Threatened	Riparian wetland and upland habitats	Skillman Loop	Potential habitat identified on both Skillman and Pleasant Run Loops during habitat surveys completed in September 2013.	Best Management Practices; Transco is currently consulting with NJDEP to determine mitigation measures.
Northern Copperhead [a]	Special Concern	Mixed and coniferous forest	Skillman Loop	No field surveys are planned.	Best Management Practices
Downy Phlox [a, b]	Endangered	Open woods and open meadows	Skillman and Pleasant Run Loops	Not identified during rare plant species surveys completed in May, June, and September 2013.	None proposed due to absence of species from Project area.
Narrow-leaf Horse-gentian [a, b]	Endangered	Rocky forests and woodlands	Skillman and Pleasant Run Loops	Not identified during rare plant species surveys completed in May, June, and September 2013.	None proposed due to absence of species from Project area.
Frank's Sedge [a]	Rare	Wetlands	Skillman and Pleasant Run Loops	Not identified during rare plant species surveys completed in May, June, and September 2013.	None proposed due to absence of species from Project area.
Cattail Sedge [a]	Rare	Wetlands	Skillman and Pleasant Run Loops	Not identified during rare plant species surveys completed in May and June 2013.	None proposed due to absence of species from Project area.
Wild Comfrey [a, b]	Special Concern	Wetlands	Skillman and Pleasant Run Loops	Seven populations identified along the Skillman Loop during rare plant species surveys completed in May, June, and September 2013.	Transco is currently consulting with NJDEP to determine mitigation measures.
Yellow Giant Hyssop [a, b]	Special Concern	Wetlands	Skillman and Pleasant Run Loops	One population identified during rare plant species surveys completed September 2013.	Transco is currently consulting with NJDEP to determine mitigation measures.
Winged Monkey Flower [a]	Rare	River edges, swamps, shady stream banks, wet woods, marshes, wet meadows, ditches	Skillman and Pleasant Run Loops	Six populations identified during rare plant species surveys completed September 2013.	Transco is currently consulting with NJDEP to determine mitigation measures.
Bobolink [a, b]	Threatened	Hayfields and pastures	Skillman Loop	No songbird surveys are proposed.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3

TABLE 2.3.3-3

State-Listed Threatened and Endangered Species Identified in the Vicinity of the Project

Species Name	State Status	Habitat	Project Component	Field Survey Results	Seasonal Timing Restrictions or Proposed Mitigation
Eastern Meadowlark [a, b]	Special Concern	Grasslands, prairies, lightly grazed pastures, mixed-grass hayfields	Skillman Loop	No songbird surveys are proposed.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Cooper's Hawk [a, b]	Special Concern	Forest edges and small openings along streams or roads	Skillman Loop	Surveys in areas where tree cutting would occur would be conducted in spring 2014 to determine the presence of any raptor nests that would be impacted by the project. These surveys would also be conducted to identify the density of nesting birds in the area.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Bald Eagle [a, b]	Threatened	Tall trees near riparian areas	Skillman Loop	Transco conducted aerial helicopter surveys for raptor nests along the pipeline loops within an approximate 0.25 mile corridor. No raptor nests were observed during the aerial survey.	None proposed
Barred Owl [a, b]	Threatened	Mature wet woods containing large trees with cavities	Skillman Loop	Surveys in areas where tree cutting would occur would be conducted in spring 2014 to determine the presence of any raptor nests that would be impacted by the project. These surveys would also be conducted to identify the density of nesting birds in the area.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Wood Thrush [a, b]	Special Concern	Deciduous or mixed forests with dense tree canopy and well-developed understory, especially near wetlands	Skillman Loop	No songbird surveys are proposed.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Grasshopper Sparrow [a, b]	Threatened	Grassland, upland meadow, pasture, hayfield, and old field habitats	Skillman and Pleasant Run Loops	No songbird surveys are proposed.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Great Blue Heron [a, b]	Special Concern	Nests in both wetland and upland habitat near waterbodies	Skillman and Pleasant Run Loops	No surveys proposed for this species.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3

TABLE 2.3.3-3

State-Listed Threatened and Endangered Species Identified in the Vicinity of the Project

Species Name	State Status	Habitat	Project Component	Field Survey Results	Seasonal Timing Restrictions or Proposed Mitigation
American Kestrel [a, b]	Threatened	Large open areas with short vegetation such as farmland, parkland, and livestock pastures	Skillman and Pleasant Run Loops	Surveys in areas where tree cutting would occur would be conducted in spring 2014 to determine the presence of any raptor nests that would be impacted by the project. These surveys would also be conducted to identify the density of nesting birds in the area.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Brown Thrasher [b]	Special Concern	Dense thickets and shrub areas within deciduous forest clearings and forest edge	Skillman and Pleasant Run Loops	No songbird surveys are proposed.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Vesper Sparrow [b]	Endangered	Cultivated fields, grasslands, fallow fields, and pastures	Skillman and Pleasant Run Loops	No songbird surveys are proposed.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Long-eared Owl [b]	Threatened	Mosaic of wooded and open habitats	Skillman and Pleasant Run Loops	Surveys in areas where tree cutting would occur would be conducted in spring 2014 to determine the presence of any raptor nests that would be impacted by the project. These surveys would also be conducted to identify the density of nesting birds in the area.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Savannah Sparrow [b]	Threatened	Hay and alfalfa fields, fallow fields, grasslands, upland meadows, airports, pastures, and vegetated landfills	Skillman and Pleasant Run Loops	No songbird surveys are proposed.	Transco would implement vegetation clearing restrictions – refer to section 2.3.3
Pennsylvania Species					
Northern Flying Squirrel [c]	Endangered	Old growth boreal forests with heavy coniferous component	Franklin Loop	No field surveys are proposed	Avoid tree clearing between April 15 and June 15; Transco is currently consulting with PGC to develop a Northern Flying Squirrel Mitigation Plan

TABLE 2.3.3-3

State-Listed Threatened and Endangered Species Identified in the Vicinity of the Project

Species Name	State Status	Habitat	Project Component	Field Survey Results	Seasonal Timing Restrictions or Proposed Mitigation
Eastern Small Footed Myotis [c]	Threatened	Caves, mines, rock outcrops, and talus fields	Franklin Loop	Preliminary cave/crevice surveys were conducted and results were filed with the Pennsylvania Game Commission in February 2014. Additional surveys will be conducted in spring 2014.	Transco is currently consulting with PGC to determine mitigation measures.
Canadian Serviceberry [d]	Endangered		Dorrance Loop	One population identified during rare plant species surveys completed in June 2013.	See species discussion below for mitigation measures.
Few-seeded Sedge [d]	Threatened	Muck or beat bogs, along shores and in other wet places	Dorrance and Franklin Loops	Not identified during rare plant species surveys completed in June 2013.	None proposed due to absence of species from Project area.
Variable Sedge [d]	Threatened	Woodland margins, thin woods, and barrens in sandy-peaty soils	Dorrance and Franklin Loops	Not identified during rare plant species surveys completed in June 2013.	None proposed due to absence of species from Project area.
Long's Sedge [d]	Threatened	Woodland margins, thin woods, and barrens in sandy-peaty soils	Dorrance and Franklin Loops	Not identified during rare plant species surveys completed in June 2013.	None proposed due to absence of species from Project area.
Blunt Manna-grass [d]	Endangered	Cedar swamps, swamps, bogs, and shallow water	Dorrance and Franklin Loops	Not identified during rare plant species surveys completed in June 2013.	None proposed due to absence of species from Project area.
Sweet-gale [d]	Threatened	Bogs and shallow water of lake and stream edges	Dorrance and Franklin Loops	Not identified during rare plant species surveys completed in June 2013.	None proposed due to absence of species from Project area.
White Water Crowfoot [d]	Special Concern	Floodplains, streams, rivers, ponds, ditches, and marshes	Franklin Loop	One population identified during rare plant species surveys completed in June 2013.	See species discussion below for mitigation measures.

[a] Species identified as potentially occurring within the Project area by NJNHP.

[b] Species identified as potentially occurring within the Project area by the New Jersey Field Office of the FWS.

[c] Species identified as potentially occurring within the Project area by the PAGC.

[d] Species identified as potentially occurring within the Project area by PADCNR.

* Rare plant species are monitored by NJNHP but are not afforded protection under the New Jersey Endangered Plant Species List Act.

The northern copperhead favors rocky, wooded uplands and wooded wetlands; and may be found hiding in rotting woodpiles, or perfectly camouflaged on the leafy forest floor. The range for the northern copperhead includes rocky talus slopes and forest habitats in the Northern Region, but primarily in Sussex, Warren, Hunterdon, and Passaic Counties (NJDEP, 2014). Because northern copperheads are adept at avoiding humans, impacts on this species as a result of construction activities are expected to be minimal and mitigated by the species behavioral response to avoid the area. Transco would employ a biological monitor to clear an area for this species prior to construction.

Transco conducted targeted floristic surveys of the Skillman and Pleasant Run Loops in May, June, and September 2013 to determine the presence or absence of downy phlox, narrow-leaf horse gentian, Frank's sedge, cattail sedge, wild comfrey, and yellow giant hyssop. Seven populations of wild comfrey were found at various locations within deciduous forest habitat along the Skillman Loop, and one population of yellow giant hyssop was identified within a fallow field habitat. In addition, although not a target species, six populations of winged monkey flower were also found associated with two streams and a wetland (SS-010-002, SS-010-003, WW-002-010). Transco continues to consult with the NJDEP to develop and implement appropriate avoidance and mitigation measures for these species.

We conclude that no impacts would occur on downy phlox, narrow-leaf horse gentian, Frank's sedge, or cattail sedge due to their confirmed absence in the Project area.

The NJNHP and FWS identified 13 bird species as potentially occurring within the project area. As discussed in section 2.3.3, Transco has agreed to adopt vegetation clearing windows during construction. In addition, based on comments from the New Jersey Field Office of the FWS, Transco plans to conduct surveys in areas where tree cutting would occur in spring 2014 to determine the presence of any raptor nests that would be impacted by the Project. These surveys would also be conducted to identify the density of nesting birds in the area. The survey results would be incorporated into Transco's Migratory Bird Habitat Restoration Plan.

Pennsylvania

Transco's consultations with the PAFBC, PADCNR, and PAGC regarding review of the Project facilities in Pennsylvania for potential impacts on species and resources of concern identified eight state-listed threatened, endangered, or special concern plant species that may occur along the Franklin and/or Dorrance Loops in Pennsylvania. The PAFBC also identified the northern long-eared bat as a species of concern in Pennsylvania, which is also proposed for federal listing and is discussed earlier in this section. In addition, consultation with the PADCNR and/or field surveys identified the following ecological communities identified as special concern resources along the Franklin Loop: red-spruce palustrine forest, leatherleaf sedge wetland, and low heath shrubland. Impacts and mitigation for these communities are discussed further in section 2.3.1. A summary of surveys and/or proposed mitigation for the remaining species is discussed below and summarized in table 2.3.3-2.

The northern flying squirrel is a small squirrel whose habitat is currently limited to northern conifer forests. Transco has agreed to avoid tree clearing activities between April 15 and June 15 to avoid potential impacts on northern flying squirrel young that may be confined to the nest during this period, per the PAGC's recommendation. In addition, at the request of the

PAGC, Transco submitted detailed plans of the permanent and temporary right-of-way limits to illustrate avoidance and minimization of impacts on forested habitat adjacent to the existing, cleared right-of-way along the portion of the Franklin Loop where the northern flying squirrel is known to occur. Transco also evaluated various route variations and refinements for this particular area of concern, in response to the PAGC's request. Transco continues to consult with the PAGC to develop a Northern Flying Squirrel Mitigation Plan.

The eastern small footed myotis is among the smallest bats in eastern North America. Habitat for this species includes caves and abandoned mines for hibernating during the winter months (generally mid-November through March); and caves, mines, talus areas associated with rocky ridge-tops, rock outcrops or ground level talus slopes for summer roosting (generally April through mid-November). The PAGC requested that Transco perform a habitat assessment for day roost habitat (all surface rock encountered). Transco conducted preliminary surface rock habitat surveys and provided the report to the PAGC in February 2014. Transco stated that it conducted additional cave/crevice and surface rock surveys in spring 2014 and determined that potential habitat for the eastern small footed myotis occurs within the Project Area. Transco continues to consult with the PAGC to develop and implement appropriate avoidance and mitigation measures for this species.

Transco conducted targeted floristic surveys of the Franklin and Dorrance Loops in June 2013 to determine the presence or absence of few-seeded sedge, Canadian serviceberry, variable sedge, Long's sedge, blunt manna-grass, and sweet-gale. Canadian serviceberry was found within a wetland (WW-001-010) along the Dorrance Loop. In addition, although not a target species, white water crowfoot was also found within waterbody SS-001-025. In a letter dated December 19, 2013, the PADCNR concluded that the Canadian serviceberry and white water crowfoot should not be directly impacted, but requested that Transco implement the following measures to further protect these species:

- install orange construction fencing to protect plants from accidental impacts;
- clean construction equipment prior to working in these areas to prevent the spread of invasive plant species; and
- begin work in areas not infested with invasive plant species and work toward areas that are infested to prevent further spread, if possible.

We conclude that no impacts would occur on few-seeded sedge, Canadian serviceberry, variable sedge, blunt manna-grass, or sweet-gale due to their confirmed absence in the Project area.

General Impacts and Mitigation

In general, impacts on state-listed species would typically be similar to those described for other plant and animal species in sections 2.3.1 and 2.3.2. Transco continues to consult with state agencies to develop and implement appropriate avoidance and mitigation measures including timing restrictions, as necessary, to avoid adverse impacts on any rare plants and wildlife identified within the Project area. Given that some surveys for state-listed species are not yet completed, **we recommend that:**

- **Prior to construction, Transco should file with the Secretary any outstanding survey results for state-listed species and identify any additional mitigation measures developed in consultation with the applicable state agencies.**

2.4 LAND USE, RECREATION, SPECIAL INTEREST AREAS, AND VISUAL RESOURCES

2.4.1 Land Use

Land use in the Project area consists primarily of open, forest, agricultural, and commercial/industrial uses. The Project would require 796.7 acres for construction. Upon completion, Transco would maintain 79.6 acres as new permanent easement, 1.3 acres for aboveground facilities, and 3.1 acres for access roads. The remaining 712.7 acres would be restored and allowed to revert to preconstruction uses, with the exception of about 26.8 acres of forest land within the 79.6-acre right-of-way, which would be permanently converted to open land.

Pipeline Facilities

Transco would utilize 50 feet of existing, cleared right-of-way for the loops, thus reducing construction-related impacts. Transco would also require the use of ATWS during construction at several locations where specialized construction techniques would be used such as road and wetland crossings.

The permanent right-of-way for the proposed loops would typically be 50 feet wide, consisting of 25 feet of right-of-way already maintained for operation of its existing pipelines and 25 feet of new right-of-way. Transco would reduce its permanent right-of-way at several locations where the potential for structure placement and nearby large trees and vegetation exists.

The land retained as permanent right-of-way would generally be allowed to revert to former use; however, certain activities such as the construction of aboveground structures would be prohibited. To facilitate pipeline inspection, operation, and maintenance, the entire permanent right-of-way in upland areas would be cleared of woody vegetation and maintained in an herbaceous/scrub-shrub vegetated state. This maintained right-of-way would be mowed no more than once every 3 years. Additionally, to facilitate routine patrols and emergency access, a 10-foot-wide strip centered over the pipeline would be mowed annually. In wetland areas, trees within 15 feet of the pipeline centerline with roots that could compromise the integrity of the pipeline coating may be selectively cut and removed. As discussed in section 1.2.1, aerial photograph-based alignment sheets depicting the construction and permanent right-of-way configurations for the proposed loops can be viewed on the FERC Internet website (http://www.ferc.gov).

Table 2.4.1-1 summarizes the acres of each land use type that would be affected by construction and operation of the loops. Construction of the pipeline facilities, including ATWS, would temporarily affect 413.9 acres of land, of which 79.6 acres would be retained as new permanent right-of-way. The remaining 334.3 acres used for temporary construction right-of-way would be allowed to revert to prior uses following construction.

TABLE 2.4.1-1

Land Affected by Construction and Operation of the Pipeline Facilities (acres) [a]

State/Facility	Open Land		Agricultural		Commercial/ Industrial		Forest Land		Residential		Waterbodies/ Wetlands		Total	
	Con [b]	Op [c]	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op
New Jersey														
Skillman Loop														
Pipeline Right-of-Way														
Outside Existing Maintained Right-of-Way	16.2	7.4	2.7	1.0	1.1	0.0	13.8	5.9	2.7	1.0	2.2	1.3	38.7	16.6
Within Existing Maintained Right-of-Way	11.0	0.0	1.1	0.0	0.3	0.0	0.0	0.0	1.3	0.0	1.5	0.0	15.2	0.0
Additional Temporary Workspace	7.5	0.0	6.2	0.0	0.1	0.0	3.6	0.0	1.2	0.0	0.2	0.0	18.8	0.0
Pleasant Run Loop														
Pipeline Right-of-Way														
Outside Existing Maintained Right-of-Way	24.3	9.4	6.5	2.7	2.3	0.1	15.0	2.9	4.0	1.2	2.0	0.8	54.1	17.1
Within Existing Maintained Right-of-Way	24.3	0.0	3.5	0.0	1.1	0.0	0.0	0.0	3.4	0.0	0.6	0.0	32.9	0.0
Additional Temporary Workspace	12.4	0.0	3.8	0.0	0.1	0.0	2.0	0.0	2.3	0.0	0.1	0.0	20.7	0.0
New Jersey Subtotal	95.7	16.8	23.8	3.7	5.0	0.1	34.4	8.8	14.9	2.2	6.6	2.1	180.4	33.7
Pennsylvania														
Franklin Loop														
Pipeline Right-of-Way														
Outside Existing Maintained Right-of-Way	21.3	15.5	0.0	0.0	1.6	0.1	42.6	14.9	1.0	0.1	11.1	5.4	77.6	36.0
Within Existing Maintained Right-of-Way	55.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0	2.8	0.0	5.2	0.0	63.8	0.0
Additional Temporary Workspace	8.4	0.0	0.0	0.0	0.4	0.0	8.3	0.0	0.1	0.0	2.0	0.0	19.2	0.0
Dorrance Loop														
Pipeline Right-of-Way														
Outside Existing Maintained Right-of-Way	9.3	6.1	1.4	0.3	0.4	0.0	17.6	3.1	0.0	0.0	1.2	0.4	29.9	9.9
Within Existing Maintained Right-of-Way	34.2	0.0	1.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	2.1	0.0	37.5	0.0
Additional Temporary Workspace	2.2	0.0	0.6	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.4	0.0	5.5	0.0
Pennsylvania Subtotal	130.8	21.6	3.1	0.3	2.9	0.1	70.8	18.0	3.9	0.1	22.0	5.8	233.5	45.9
Project Total	**226.5**	**38.4**	**26.9**	**4.0**	**7.9**	**0.2**	**105.2**	**26.8**	**18.8**	**2.3**	**28.6**	**7.9**	**413.9**	**79.6**

[a] Includes the temporary and permanent right-of-way and additional temporary workspace areas.

[b] For the loops, assumes a 105-foot-wide construction right-of-way in upland areas, including 50 feet of existing permanent right-of-way and 55 feet of temporary construction workspace, and a 75-foot-wide construction right-of-way in wetlands.

[c] For the loops, assumes a 25-foot-wide area at most locations where structures would be precluded from being installed within the new permanent, operational right-of-way. This is in addition to the 50 feet of existing permanent right-of-way for the existing Transco pipelines where structures are already precluded from being installed.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Con = construction; Op = operation

Aboveground Facilities

The majority of land use impacts associated with the Project at aboveground facilities would occur within existing fenced and developed areas, would not affect land already being used for facility operation, and would not result in a land use change. Approximately 290.0 acres of land would be required for modifications to and installation of aboveground facilities (see table 1.9-1). This includes 260.8 acres at existing compressor stations, which would temporarily affect primarily agricultural, open, forest, and commercial/industrial land within the facility fencelines. No permanent land conversions would occur as a result of the proposed activities at compressor stations. Another 23.2 acres of land would be temporarily affected by modifications to, removal of, and/or installation of MLVs and pig launcher/receivers, and M&R stations within existing facility fencelines. Additionally, of the total area affected at aboveground facility sites, about 5.9 acres of land would be newly affected within the existing facility fenceline. Of the newly affected land, 1.3 acres would be affected by permanent changes to the land use (e.g., open land would be converted to commercial/industrial land) beyond that already being experienced at the site. Table 2.4.1-2 lists the impacts associated with new temporary land use impacts and permanent land use changes at the MLV and M&R sites.

Contractor/Pipe Storage Yards and Contractor Staging Areas

Transco proposes to use 5 contractor/pipe storage yards and 12 contractor staging areas on a temporary basis to support construction activities (see table 2.4.1-3). These yards would temporarily affect 85.5 acres of land, consisting of commercial/industrial land, open, forest, wetlands, waterbodies, and agricultural land. Upon completion of construction, the yards would be restored in accordance with Transco's Plan and Procedures, and prior use of the sites would continue.

Access Roads

While public roads and the construction right-of-way would be used for primary access to project workspaces, Transco proposes to:

- build and permanently maintain 2 roads for operations;
- permanently maintain 6 existing roads for operations (2 of which do not require modifications);
- build 3 new roads for temporary use, which would be returned to preconstruction conditions following construction; and
- modify 12 private, existing roads for temporary access during construction (see appendix B).

Of the proposed access roads, 15 are associated with yard and pipeline right-of-way access and 8 are associated with aboveground facility access. The majority of these roads have a gravel, dirt, or vegetation surface and would require surface modification, widening, and tree clearing based on the equipment that would use the road. Modifications to existing temporary access roads would affect 1.3 acres of land in New Jersey and 6.0 acres of land in Pennsylvania during construction. Permanent access roads would affect 2.3 acres of land in New Jersey and 0.8 acre of land in Pennsylvania.

TABLE 2.4.1-2

Land Affected by Aboveground Facilities Associated with the Project (acres)

		Land Use							
		Open		Commercial/ Industrial		Forest		Total	
Facility	County, State	Con [a]	Op [b]	Con	Op	Con	Op	Con	Op
MLVs									
200D27	Mercer County, NJ	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3
505LD90	Monroe County, PA	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
505LD @ MP 63.19	Monroe County, PA	<0.1	<0.1	0.0	0.0	<0.1	<0.1	0.1	0.1
515LD @ MP 17.70	Luzerne County, PA	0.3	0.3	0.0	0.0	0.2	0.2	0.5	0.5
515LD @ MP 22.97	Luzerne County, PA	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2
M&R Stations									
Columbia Gas of Virginia - Alta Vista M&R Station	Pittsylvania County, VA	<0.1	<0.1	0.1	0.0	0.0	0.0	0.1	<0.1
Columbia Gas of Virginia – Brookneal M&R Station	Campbell County, VA	0.1	<0.1	0.1	0.0	0.0	0.0	0.2	<0.1
Columbia Gas of Virginia – Lynchburg M&R Station	Appomattox County, VA	<0.1	<0.1	0.1	<0.1	0.0	0.0	0.1	<0.1
Columbia Gas of Virginia - Virginia Fibre M&R Station	Appomattox County, VA	0.0	0.0	0.1	<0.1	0.0	0.0	0.1	<0.1
CVG Bear Garden Interconnect M&R Station	Buckingham County, VA	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Columbia Gas of Virginia – Scottsville M&R Station	Fluvanna County, VA	0.0	0.0	0.1	<0.1	0.0	0.0	0.1	<0.1
Tenaska, Inc. - Antioch M&R Station	Fluvanna County, VA	0.0	0.0	0.4	0.0	0.0	0.0	0.4	0.0
Columbia Gas - Louisa Road M&R Station	Louisa County, VA	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Columbia Gas - Boswells Tavern M&R Station	Louisa County, VA	<0.1	0.0	0.0	0.0	0.0	0.0	<0.1	0.0
Columbia Gas - Gordonsville Co-Gen M&R Station	Louisa County, VA	0.0	0.0	<0.1	0.0	0.0	0.0	<0.1	0.0
Columbia Gas Transmission - Fredericksburg M&R Station	Culpepper County, VA	<0.1	<0.1	0.0	0.0	0.0	0.0	<0.1	<0.1
ODEC Marsh Run M&R Station	Fauquier County, VA	0.0	0.0	<0.1	0.0	0.0	0.0	<0.1	0.0
Columbia Gas - Remington M&R Station	Fauquier County, VA	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0
Dominion Transmission – Nokesville M&R Station	Prince William County, VA	0.0	0.0	<0.1	0.0	0.0	0.0	<0.1	0.0
Columbia Gas - Prince William M&R Station	Prince William County, VA	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.0
Washington Gas Light - Bull Run M&R Station	Prince William County, VA	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
Dominion Transmission - Pleasant Valley Interconnect M&R Station	Fairfax County, VA	0.7	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Washington Gas Light - Herndon M&R Station	Fairfax County, VA	<0.1	<0.1	0.2	0.0	0.0	0.0	0.2	<0.1
Rockville M&R Station	Montgomery County, MD	0.0	0.0	0.6	0.0	0.0	0.0	0.6	0.0
Westmore Road M&R Station	Montgomery County, MD	0.0	0.0	<0.1	0.0	0.0	0.0	<0.1	0.0
Washington Gas - Rock Creek M&R Station	Montgomery County, MD	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0
Project Total		**1.7**	**0.9**	**3.9**	**<0.1**	**0.3**	**0.3**	**5.9**	**1.3**

[a] Construction-related impacts associated with modifications to existing aboveground facilities consist of temporary impacts within the existing fenceline.

[b] Operation-related impacts associated with modifications to existing aboveground facilities consist of permanent impacts within the existing fenceline.

Con = construction; Op = operation

TABLE 2.4.1-3

Land Use Impacts Associated with Contractor/Pipe Storage Yards and Contractor Staging Areas

Segment/Facility	County, State	Existing Land Use	Temporary Impacts (acres)
Skillman Loop			
CSA/CY/PY-SK-01 [a]	Mercer County, NJ	Commercial/Industrial, Open, Forest	5.7
CSA/CY/PY-SK-02 [a]	Somerset County, NJ	Commercial/Industrial, Open, Forest	1.9
CSA/CY/PY-SK-03 [b]	Somerset County, NJ	Agricultural, Open	7.0
		Subtotal	14.6
Pleasant Run Loop			
CSA/CY/PY-PR-01 [a]	Somerset County, NJ	Commercial/Industrial	0.7
CSA/CY/PY-PR-02 [b]	Somerset County, NJ	Commercial/Industrial	8.5
CSA/CY/PY-PR-07 [a]	Hunterdon County, NJ	Commercial/Industrial, Open, Forest, Residential	0.4
		Subtotal	9.6
Franklin Loop			
CSA/CY/PY-FR-05 Mount Effort Pipe Storage/Contractor Yard [a, c]	Monroe County, PA	Commercial/Industrial, Open, Wetland	22.6
CSA/CY/PY-FR-06 [b]	Monroe County, PA	Commercial/Industrial, Open	5.0
CSA/CY/PY-FR-01 [a]	Monroe County, PA	Commercial/Industrial, Open, Residential, Wetland	1.4
CSA/CY/PY-FR-02 [a]	Monroe County, PA	Commercial/Industrial, Open	1.8
CSA/CY/PY-FR-03 [a]	Monroe County, PA	Commercial/Industrial, Open	0.6
CSA/CY/PY-FR-04 [a]	Luzerne County, PA	Commercial/Industrial, Open, Forest, Waterbody/Wetland	19.9
		Subtotal	51.3
Dorrance Loop			
CSA/CY/PY-DO-01 [a]	Luzerne County, PA	Commercial/Industrial, Open, Forest, Wetland	1.1
CSA/CY/PY-DO-02 [a]	Luzerne County, PA	Commercial/Industrial, Open, Agricultural	0.7
CSA/CY/PY-DO-03 [b]	Luzerne County, PA	Commercial/Industrial, Open, Forest, Agricultural	6.4
CSA/CY/PY-DO-04 [a]	Luzerne County, PA	Forest	1.3
CSA/CY/PY-DO-05 [a]	Luzerne County, PA	Commercial/Industrial, Open, Forest	0.5
		Subtotal	10.0
		Project Total	**85.5**

[a] Contractor staging area.

[b] Contractor/pipe storage yard.

[c] Yard would also be used for the Skillman, Pleasant Run, and Dorrance Loops; land use impacts are accounted for with the Franklin Loop.

Additional Temporary Workspace

In addition to the construction right-of-way previously noted, Transco identified certain areas where site-specific conditions require the use of ATWS in addition to the nominal construction rights-of-way. ATWS generally would be required in areas where the pipeline route crosses wetlands and waterbodies; steep side slopes; bedrock outcrops; agricultural land; and roads, railroads, and existing utilities. As listed in table 2.4.1-1, a total of 64.2 acres of ATWS would be used during the construction of the Project; a full list is included in appendix E.

2.4.2 General Impacts

Open Land

Open land includes open space (e.g., existing right-of-way, vacant land), grassland, pasture/hay, and scrub-shrub upland. Tables 2.4.1-1, 2.4.1-2, and 2.4.1-3 list the Project's construction and operation impacts on open land.

The majority of the open land that would be impacted by the Project is associated with either Transco's existing rights-of-way or aboveground facilities. Construction-related impacts on open land would include the removal of vegetation and disturbance of the soils. These impacts would be temporary and short term and would be minimized by implementation of Transco's Plan and Procedures. Following construction, most open land uses would be able to continue and would likely return to preconstruction conditions in 1 to 5 years.

Forest Land

Forest land includes upland forest or woodland, except forested wetlands. Tables 2.4.1-1, 2.4.1-2, and 2.4.1-3 list the construction and operation impacts associated with the Project on forest land.

As discussed in more detail in section 2.3.1, construction of the Project in forested areas would require the removal of trees to prepare the construction work areas. However, Transco would minimize forest land impacts by locating the proposed facilities within existing rights-of-way, minimizing the construction workspace, and utilizing open or agricultural land for aboveground facilities or contractor/pipe yards and contractor staging areas to the extent possible. Following construction, disturbed areas would be restored to current conditions to the extent possible, in accordance with Transco's Plan and Procedures. Although trees cleared within temporary construction work areas would be allowed to regenerate to preconstruction conditions following construction, impacts on forest resources within these areas would be long term.

We received comments from Montgomery Township regarding impacts on wooded portions of a number of Township- and privately owned properties that are also held by the Township as Green Acres easements. In response to these comments, Transco has stated it would reduce the typical construction corridor across these wooded areas from 105 feet wide to 85 feet wide.

Following construction, permanent impacts would occur over the maintained portion of the right-of-way and aboveground facilities where forest land would be converted to open land. In addition, the clearing of Transco's permanent easement every 3 years would prevent forest overstory vegetation from attaining a mature size and, thus, would permanently alter the nature of the affected forest land.

Agricultural Land

Agricultural land includes croplands that are being actively cultivated. Tables 2.4.1-1 and 2.4.1-3 list the construction and operation impacts associated with the Project on agricultural

land. Agricultural lands that would be impacted by the Project are primarily used for raising crops, including buckwheat, hay, corn, and greenhouse and nursery stock plants as the most common commodities grown in farmed areas of New Jersey and Pennsylvania.

Construction on annually cultivated agricultural land is described in section 1.6.1. The effects of construction on agricultural land would be expected to be minor and short term. Short-term impacts on agricultural areas would include the loss of standing or row crops within the construction work area and the disruption of farming operations for the growing season during the year of construction. To reduce these impacts, Transco would adhere to the measures outlined in its Plan and Procedures. These measures include testing the topsoil and subsoil for compaction at regular intervals in areas disturbed by construction activities; strictly controlling equipment traffic on agricultural land to minimize compaction and rutting; and plowing severely compacted soil. To preserve soil fertility in agricultural land, the entire topsoil layer (to a maximum depth of 12 inches) would be stripped from either the pipeline trench and subsoil storage area or the full construction right-of-way, as stipulated in landowner agreements, and stored separately from the subsoil for replacement after backfilling the trench.

Transco would be responsible for repairing or replacing any drain tiles or irrigation systems damaged by Project construction. Transco would employ specialists to verify that the repairs made have been successful. Following construction, Transco would monitor the function of encountered drainage systems after construction to ensure that performance of drain tile systems remains consistent with performance prior to construction.

Active pasture land crossed by the pipeline loops would be protected by securing existing fences and installing temporary gates to control livestock.

Also included as an agricultural land use are several specialty crop areas and horse pastures (see table 2.4.2-1).

TABLE 2.4.2-1

Specialty Agricultural Areas Crossed by the Project

Loop/Milepost	Type	Mitigation Measures
Skillman Loop		
1778.7	Pasture	Horses – Transco is still discussing options with the landowner
1779.3	Organic Farm	Do not apply pesticides or herbicides and do no block farm access route for animals and tractors; HDD would minimize land disturbance
Pleasant Run Loop		
2.0	Pasture	Horses – the landowner has refused to discuss options with Transco
2.6	Pasture	Board horses off site
2.7	Pasture	Temporary fencing
3.7	Pasture	Temporary fencing but may need boarding of horses off site
5.2	Pasture	Horses can be moved to alternate pastures; improvements to alternate pastures will be done
5.9	Pasture	Board horses off site
Franklin Loop		
65.0	Pasture	Board horses off site
Dorrance Loop		
18.9	Pasture	New fence and gates to be put up during pipeline construction
19.4	Pasture	New fence and walkway for horses to enter barn during pipeline construction

Transco is working with these landowners to determine additional crossing procedures that may be required for these specialty agricultural lands, such as topsoil segregation in all agricultural and pasture areas, temporary safety fencing, off-site boarding of animals, and/or avoiding the use of pesticides on or near organic farms.

Following construction, Transco would implement the restoration practices outlined in its Plan and Procedures. Agricultural crops would be allowed to return within the permanent right-of-way and uses would continue as before construction. Transco would monitor crops in agricultural areas during the first and second growing seasons after seeding, and if necessary, complete additional restoration.

New Jersey

The Skillman and Pleasant Run loops would cross 12 properties enrolled in the Farmland Preserve Program, as listed in table 2.4.2-2.

TABLE 2.4.2-2

Farmland Preserve Program Easements Affected by the Project (acres)

Loop/Begin Milepost	End Milepost	Const. Impacts	Op. Impacts	Additional Temp. Workspace	Yards
Skillman Loop					
1778.6	1778.6	3.9	1.9	1.1	0.0
1779.0	1779.4	3.6	1.8	1.3	0.0
1780.5	1781.0	6.6	2.2	1.6	0.0
Pleasant Run Loop					
0.4	1.0	11.1	5.2	3.2	0.0
2.6	2.6	0.8	0.3	0.1	0.0
2.9	3.1	2.6	0.8	0.1	0.0
3.5	3.7	2.2	0.6	0.4	0.0
3.7	3.8	1.4	0.4	0.3	0.0
4.7	4.6	2.8	0.9	0.0	0.0
5.2	5.7	7.1	2.2	2.1	4.6
5.7	5.8	0.1	0.0	0.0	0.0
Project Total		**42.2**	**16.3**	**10.2**	**4.6**

The Farmland Preserve Program is administered by the State Agriculture Development Committee, and consists of land that meets the Committee's minimum eligibility criteria, qualifies for farmland tax assessment, and is part of an agricultural development area (i.e., farming is viable over the long term). Landowners who sell their development easements to the Farmland Preserve Program still own their land, but must develop the land for agricultural use. Such deed restrictions remain in force for any future landowners and ensure that the land is forever protected for agricultural use.

There is no mechanism for diverting lands from New Jersey's Farmland Preserve Program. Deed restrictions prohibit non-agricultural development on these lands. Therefore, Transco would negotiate with each landowner for a right-of-way across his/her lands. If an agreement cannot be reached, Transco would need to initiate condemnation proceedings at the appropriate time in order to secure the right-of-way and remove the program restrictions.

Pennsylvania

Agricultural Security Areas – the Franklin and Dorrance Loops would cross eight Agricultural Security Area (ASA) properties, as listed in table 2.4.2-3.

TABLE 2.4.2-3

Agricultural Security Areas Affected by the Project (acres)

Loop/Begin Milepost	End Milepost	Const. Impacts	Op. Impacts	Additional Temp. Workspace	Yards
Franklin Loop					
58.8	59.4	7.0	2.9	0.7	0.0
Dorrance Loop					
17.8	18.3	2.2	0.4	0.0	0.7
18.3	18.6	0.0	0.0	0.0	0.0
18.4	18.6	3.0	1.4	0.3	0.0
18.7	19.0	3.6	1.7	0.5	0.0
19.0	19.4	0.1	0.0	0.0	0.0
19.7	20.2	6.3	3.0	0.2	6.5
20.2	20.4	2.6	1.3	0.5	0.0
Project Total		**24.8**	**10.7**	**2.2**	**7.2**

An ASA is a unit of land of 250 or more acres reserved for agricultural production of crops, livestock, or livestock products that have been designated as such[10] (Pennsylvania Code, 2012). Enrollment as an ASA is voluntary. An ASA property is provided protection from laws prohibiting agriculture activities and requires entities seeking to acquire ASA land by eminent domain to obtain advance approval from the Agricultural Lands Condemnation Approval Board of the Commonwealth, per section 13 of the act (3 P.S. § 913) (Pennsylvania Code, 2012). A designation of ASA does not prohibit the landowner from allowing oil or gas development on the land (Wolfgang, 2011), and the pipeline would not disqualify a property from its current enrollment status. Therefore, it is not anticipated that the Project would impact ASA designations.

Clean and Green Program – The Pennsylvania Department of Agriculture oversees and administers the Clean and Green Program, established under the Pennsylvania Farmland and Forest Land Assessment Act, also referred to as Act 319. The program was developed to preserve and protect farmland and forested areas throughout the state. The Clean and Green Program provides a tax benefit to owners of agricultural or forest land by basing property taxes on the use value of the land as compared to its market value. Individual owners who agree to solely devote their lands to agricultural use, agricultural reserve, or forest reserve are given preferential assessment. Table 2.4.2-4 lists the Clean and Green properties crossed by portions of the construction work area associated with the Franklin and Dorrance Loops.

[10] Pennsylvania Code 1967 P. L. 992, No. 442 and 32 P. S. § § 5001 – 5012

TABLE 2.4.2-4

Clean and Green Program Areas Affected by the Project (acres)

Loop/Begin Milepost	End Milepost	Const. Impacts	Op. Impacts	Additional Temp. Workspace	Yards
Franklin Loop					
58.2	58.7	6.9	2.5	2.0	0.0
58.8	59.4	7.0	2.9	0.7	0.0
61.0	61.1	0.0	0.0	0.2	0.0
62.6	62.9	2.7	1.0	0.2	0.0
62.9	63.0	0.9	0.4	0.0	0.0
63.0	63.4	4.4	1.7	0.6	0.0
63.4	63.8	4.7	1.8	0.0	0.0
63.3	64.2	2.9	1.1	0.1	0.0
64.8	65.0	2.5	1.3	0.3	0.0
64.8	65.0	0.9	0.0	0.8	0.0
65.1	65.5	5.2	1.9	0.6	0.0
65.9	66.4	7.0	2.3	0.1	0.0
66.4	67.0	8.7	2.7	1.6	0.0
Dorrance Loop					
18.3	18.6	0.0	0.0	0.0	0.0
18.4	18.6	3.0	1.4	0.3	0.0
18.7	19.0	3.6	1.7	0.5	0.0
19.0	19.1	2.1	1.0	0.3	0.0
19.1	19.2	1.5	0.7	0.1	0.0
19.2	19.4	1.5	0.7	0.1	0.0
19.3	19.6	0.0	0.0	<0.01	0.0
19.7	20.2	6.3	3.0	0.2	6.5
20.2	20.4	2.6	1.3	0.5	0.0
20.4	20.6	3.0	1.4	0.0	0.0
20.7	20.9	0.7	0.4	0.2	0.0
20.9	21.3	5.3	2.5	0.6	0.0
21.3	21.7	5.2	2.5	0.0	0.0
21.7	22.0	3.8	1.8	0.1	0.0
22.0	22.3	<0.1	<0.1	0.0	0.0
22.2	22.7	1.8	0.9	0.6	0.0
Project Total		**94.2**	**38.9**	**10.7**	**6.5**

Transco has limited the proposed construction right-of-way width to 105 feet in uplands and 75 feet in wetlands along the Franklin and Dorrance Loops, and would implement the construction methods described in its Plans and Procedures. Following construction, Transco would typically retain 20 feet of new permanent right-of-way. Agricultural uses would continue normally after construction and forest land would be permanently removed from the new operational right-of-way. Based on recent amendments to Act 319 (Act 88 of 2010), landowners participating in the Clean and Green Program are protected from roll-back taxes due to the development of a gas well or installation of a pipeline on their property. Under Act 88, land subject to preferential assessment may be used for exploration for, and removal of, gas and oil, which includes the development of appurtenant facilities, including new roads and bridges, pipelines, and other buildings or structures related to those activities (Conservation Tools.org, 2012). Because of these amendments, construction and operation of the Project would not

disqualify landowners currently enrolled in the Clean and Green Program from receiving tax benefits, and parcels enrolled in the Clean and Green Program are expected to maintain their eligibility. Therefore, it is not anticipated that the Project would affect a property's status within the Clean and Green Program.

Waterbodies/Wetlands

Waterbodies and wetlands include areas of open water and field-delineated wetlands, including forested wetlands. Tables 2.4.1-1 and 2.4.1-3 list the construction and operation impacts associated with the Project on waterbodies and wetlands.

The temporary and permanent construction impacts would be minimized by reducing the nominal construction right-of-way width to 75 feet in wetland areas along the proposed loops and implementing the special wetland and waterbody construction techniques described in section 1.6.2 and in Transco's Procedures. Sensitive waterbodies are discussed in section 2.2.2. Wetland impacts by type are discussed in section 2.2.4.

Residential Land

Residential land includes developed residential areas, including residentially zoned areas that have been developed or short segments of the route near road crossings with clusters of homes near the route alignment. Residential structures identified within 50 feet of the Project are listed in appendix K. Residential lands may also overlap with other land use categories such as forested, open, and wetland. Although the impacts identified are based on land use type, we discuss residential impacts for all residences in section 2.4.4 regardless of land use category. A detailed description of impacts and mitigation on residences is discussed in section 2.4.4. Construction methods proposed for residential areas are described in section 1.6.2.

Commercial/Industrial Land

Commercial/industrial land includes utility stations, paved areas, roads, commercial or retail facilities, and manufacturing or industrial plants. Tables 2.4.1-1, 2.4.1-2, and 2.4.1-3 list the construction and operation impacts associated with the Project on commercial/industrial land.

Commercial/industrial lands affected by the Project primarily consist of previously disturbed land. Commercial/industrial structures identified within 50 feet of the Project are listed in appendix K. Patrons of retail and other businesses could be temporarily impacted during pipeline construction by increased dust from exposed soils, construction noise, and traffic congestion. Transco would minimize impacts on commercial land uses such as retail and businesses by coordinating private driveway crossings with business owners so as to maintain vehicle access. Steel plates and/or wood mats would be kept on site at all times to create as necessary a temporary platform for access. Road surfaces would be restored as soon as practicable so that normal access can resume, and commercial/industrial land uses would be restored to preconstruction conditions, or as specified in landowner agreements.

The proposed loops would cross 46 roadways, ranging from maintained local paved roads to state highways, and 2 railroads (see table 2.5.3-1). These roadways and railroads would be crossed using conventional road bore or open-cut methods as described in section 1.6.2. The

bore crossing method allows the roadway to remain in service while the installation process takes place, resulting in little or no disruption to traffic. In the event of an open-cut crossing of a roadway, impacts would include short-term traffic congestion and disruption. To minimize these impacts, Transco would consult with local law enforcement and safety officials to develop temporary traffic control plans. Because traffic may be diverted via temporary roads and driveways, traffic control would be implemented via warning signs and/or flagmen. Following construction, roadways would be restored to preconstruction conditions.

We received comments from Montgomery Township requesting that certain roads that are crossed by the Project be reconstructed to the full width indicated in the Township's Master Plan, and that other road segments not affected by the Project be reconstructed by Transco. As discussed above, Transco would restore all roads to preconstruction conditions following construction. In addition, Transco has stated it would seek road opening permits prior to construction.

Commercial/industrial land uses would be allowed to return within the permanent right-of-way and uses would continue as before construction, with the exception of commercial/ industrial structures within the permanent right-of-way, which would either be removed or relocated (primarily sheds that have encroached upon existing rights-of-way (see appendix K).

2.4.3 Land Ownership and Easement Requirements

Pipeline operators must obtain easements from landowners to construct and operate natural gas facilities, or acquire the land on which the facilities would be located. An easement agreement between a company and a landowner typically specifies compensation for losses resulting from construction, including losses of non-renewable and other resources, damages to property during construction, and restrictions on existing uses that would not be permitted on the permanent right-of-way after construction. Landowners would be compensated for the use of their land through the easement negotiation process.

For this Project, Transco's existing permanent easements associated with its existing pipelines give Transco the right to maintain the right-of-way as necessary for pipeline operation, including the periodic removal of larger vegetation and trees, as needed. In some areas, Transco has sited the Project facilities entirely within its existing permanent easement, in which case Transco would not need to acquire additional land or permanent easements. In other areas, Transco would need to acquire new easements or acquire the necessary land to construct and operate the Project. The easements would convey both temporary (for construction) and permanent rights-of-way to Transco and would give Transco the right to construct, operate, and maintain the pipeline and related facilities.

If an easement cannot be negotiated (or renegotiated) with a landowner and the Commission authorizes the Project, Transco may use the right of eminent domain granted to it under Section 7(h) of the NGA and the procedures set forth under the Federal Rules of Civic Procedure (Rule 71A) to obtain the right-of-way and ATWS areas necessary to construct and operate the Project. Transco would still be required to compensate the landowner for the right-of-way and damages incurred during construction. However, the level of compensation would be determined by a court according to state or federal law. Whether an easement or right-of-way

is obtained via negotiations or eminent domain, Transco would compensate landowners for use of the land. Eminent domain cannot be exercised to obtain lands under federal or tribal ownership but may be used to obtain lands under state and local ownership.

2.4.4 Existing Residences and Planned Developments

Existing Residences

We received many comments regarding the proximity of Transco's proposed alignment to homes and the potential construction impacts near residences. Appendix K lists the structures and related features that are within 50 feet of the proposed Project.

Structures within 50 feet of the construction work area are likely to experience effects of construction and operation of the Project. In general, as the distance to the construction work area increases, the impacts on residences decrease. In residential areas, the most common impacts associated with construction and operation of a pipeline are temporary disturbances during construction and the burden of the permanent right-of-way, which would prevent the construction of permanent structures within the right-of-way.

Temporary construction impacts on residential areas could include inconveniences caused by noise and dust generated by construction equipment, personnel, and trenching of roads or driveways; traffic congestion; ground disturbance of lawns; removal of trees, landscaped shrubs, or other vegetation screening between residences and/or adjacent rights-of-way; potential damage to existing septic systems or wells and other utilities; and removal of aboveground structures such as fences, sheds, playgrounds, or trailers from within the right-of-way.

Before mobilizing any equipment, Transco would stake the limits of disturbance and the centerline of the pipeline. Affected landowners would be notified at least 1 week prior to trench excavation on their property, or as otherwise noted in individual easement agreements.

Where the construction right-of-way crosses a road, Transco would maintain access and traffic flows, particularly for emergency vehicles. Transco would generally complete construction across driveways within 1 day and install a temporary surface patch. Final surfacing of driveways would occur separately in conjunction with other driveway final restorations within the area. If a road is open cut, one lane would remain open during construction. Transco would consult with local law enforcement and safety officials during development of a Traffic Control Plan, which may include temporary road or driveway diversions. Traffic safety personnel would be present during construction periods, including warning signs and flagmen. To the maximum extent practicable, Transco would coordinate construction traffic to avoid interference with property owner activities. Sidewalks within the vicinity of the construction work limits would be temporarily closed.

Transco would utilize special construction methods designed for working in residential areas. These special construction methods are described in section 1.6.2, and specific methods to be used on certain individual properties are shown on Transco's site-specific RCPs (see below). Transco would implement the following general measures to minimize construction-related impacts on all residences and other structures located within 50 feet of the construction right-of-way:

- attempt to reduce the construction right-of-way width near residences and use other ATWS areas located farther from the residences to minimize disruption of residences in the immediate vicinity;

- install safety fence at the edge of the construction right-of-way for a distance of 100 feet on either side of a residence;

- attempt to preserve mature trees, vegetation screens, and landscaping within the construction work area to the extent possible;

- complete final cleanup, grading, and installation of permanent erosion control devices within 10 days after backfilling the trench; and

- restore all lawn areas and landscaping within the construction work area, excluding mature trees within the permanent pipeline easement, immediately following clean up.

Transco anticipates that pipeline construction activities (e.g., pipe stringing, excavation, welding, coating, lower-in, and backfill) would last 45 construction days through residential areas without weather delays. Other activities such as tree trimming, clearing activities, and right-of-way restoration activities would be completed in accordance with state and federal timing restrictions and weather permitting, and likely occur outside the estimated 45-day construction period.

In addition, Transco would employ a vibration-monitoring specialist to review the construction plans for residences close to the Project workspace and, if needed, develop mitigation measures to avoid impacts on structures or residents. Transco would also employ a security guard to patrol the construction work areas after work hours and on weekends.

As discussed in section 2.7, air pollutants from construction equipment would be temporary and generally limited to the immediate vicinity of the construction area. To control dust created from construction activities (e.g., trenching, transporting soil or rock), Transco would implement the measures in its Fugitive Dust Control Plan.

Transco's site-specific RCPs include measures to minimize disruption and ensure access to the residences within 50 feet of the construction work areas (see appendix C). These construction plans include a dimensioned drawing depicting the residence in relation to the pipeline construction; workspace boundaries; the proposed permanent right-of-way; and other nearby residences, structures, roads, and miscellaneous features (e.g., other utilities, playgrounds, catch basin, sewer). We have reviewed the site-specific RCPs and find them acceptable. **However, we encourage the owners of each of these residences to provide us comments on the plan specific for their property.**

Based on landowner contacts, Transco has identified several septic systems that would be crossed by the loops. These are shown on the RCPs. Transco has developed a Septic System Contingency Plan that describes Transco's preferred option of avoidance, or, if avoidance is not possible, how it would identify and replace the existing septic system. Transco would relocate

and protect septic systems prior to construction. In the event of damage during construction, Transco would provide the landowner with a temporary repair or other accommodations. Once construction is complete, Transco would coordinate with the landowner to provide a suitable permanent solution.

As discussed further in section 2.2.6.2, Transco would offer landowners pre- and post-construction monitoring of water quality and yield at water wells using a qualified, independent contractor. If construction activities adversely affect a water supply, Transco would make the necessary repairs to restore the water supply system to its preconstruction capacity and, as necessary, would provide a temporary source of water. Within 30 days of placing the pipeline in service, Transco would file with the FERC a report discussing any complaints received concerning well yield or water quality and how each was resolved.

Following construction, all residential areas would be restored to preconstruction conditions or as specified in written landowner agreements. Landowners would continue to have use of the right-of-way provided such use does not interfere with the easement rights granted to Transco for construction and operation of the pipeline system. For example, no structures would be allowed on the permanent right-of-way, including houses, decks, playgrounds, tool sheds, garages, poles, guy wires, catch basins, swimming pools, trailers, leaching fields, septic tanks, or any other objects not easily removed. As shown on its site-specific RCPs, Transco would remove and relocate the majority of these features to an off-right-of-way location.

Transco also prepared a Landowner Complaint Resolution Procedure. As part of the procedure, Transco would send a letter to each landowner that includes the dates when construction would occur on their property and a telephone contact for questions or concerns. The procedure letter also states that a response to a question or concern would be provided in 24 to 48 hours, and prior to construction if possible. In the event Transco's response is not satisfactory to the landowner, the letter also identifies the FERC's Dispute Resolution Division Helpline contact information. Transco would provide the complaint resolution letter to all affected landowners 2 to 3 weeks prior to the planned construction start date. We have reviewed this procedure letter and find it acceptable.

We conclude that with implementation of Transco's proposed construction methods, its site-specific RCPs, and Landowner Complaint Resolution Procedure, impacts on residents and landowners would be minimized to the greatest extent practicable and would not be significant.

Planned Developments

Transco contacted local officials in the affected counties and municipalities to identify planned residential, commercial, or industrial developments within 0.25 mile of the Project. These are listed in table 2.4.4-1.

TABLE 2.4.4-1

Planned Developments in the Project Area

Project Type/Name	Description	Status	Nearest Project Component	Distance (miles)
Energy Projects – FERC Jurisdictional Natural Gas Pipelines				
Northeast Supply Link – Transco [a]	Expansion of natural gas transmission system	Under Construction	Pleasant Run Loop	13.5
Energy Projects - Non-FERC Regulated Pipeline				
Unknown	Bulk Propane Storage	Proposed	Unknown	Unknown
Non-Pipeline Energy Projects				
KDC Solar Branchburg LLC	Solar Panel Field	Approved Not Started	Pleasant Run Loop	2.9
S/K Stoney Brook Assoc.	Solar Panel Field	Approved Not Started	Pleasant Run Loop	2.7
PP&L Electric	Transmission Line	Approved Not Started	Unknown	Unknown
Spruce Run/Round Valley Project	Hydroelectric project	Preliminary permit	Unknown	Unknown
PP&L Electric Northeast Pocono Reliability Project [a]	Transmission Line	Planned	Unknown	Unknown
PSE & G [a]	Substation	Under Construction	Unknown	Unknown
Land Use Developments				
North Princeton Professional Center	Office	Planned	Skillman Loop	1.5
Montgomery Promenade by Madison Marquette	Retail/Homes	Planned	Skillman Loop	1.7
Westwinds Farm	54 Home Subdivision	Under Construction	Skillman Loop	0.1
Tapestry at Montgomery by Sharbell Development Corp.	218 Home Subdivision	Under Construction	Skillman Loop	1.7
Carrier Clinic Women's Residence	1,200 single family residences	Under Construction	Skillman Loop	1.0
Princeton Car Wash	Retail	Planned	Skillman Loop	3.8
Staats Farm Road Developers	7 Homes	Planned	Skillman Loop	3.5
Deer Creek LLC	16-lot single family homes	Application pending	Pleasant Run Loop	0.4
Dante Realty Co.	Office/warehouse	Application submitted/ incomplete	Pleasant Run Loop	4.6
Briad Development East LLC	134 room Hotel	Approved	Pleasant Run Loop	3.2
Capstone Holdings	10-lot single family homes	Approved	Pleasant Run Loop	5.1
Redco Branch LP	Office/Warehouse	Approved	Pleasant Run Loop	5.0
Robert Henderson	1-building – 9 units	Approved	Pleasant Run Loop	5.6
Schultz Container Systems Inc.	Office/warehouse	Approved	Pleasant Run Loop	5.0
3331 Route 22 LLC	Retail/restaurants development	Approved	Pleasant Run Loop	5.2
Branchburg Builders	50 Single family homes	Approved Started	Pleasant Run Loop	6.3
Fox Hollow II, Advance Development Partners	120-units Townhouses	Approved Started	Pleasant Run Loop	5.3
Distinctive Properties LLC	6-lot single family homes	Approved Started	Pleasant Run Loop	1.6
Handler Estates	8 Homes	Under Construction	Unknown	Unknown
Country Classics at Fox Brook	20 Homes	Planned	Unknown	Unknown
Bonaventure	Retail	Unknown	Unknown	Unknown
Sunoco	Retail/gas/ convenience store	Unknown	Unknown	Unknown
Airport Medical Building	Office	Planned	Unknown	Unknown
Blawenburg	Bank	Planned	Unknown	Unknown

TABLE 2.4.4-1

Planned Developments in the Project Area

Project Type/Name	Description	Status	Nearest Project Component	Distance (miles)
E.R. Squibb & Sons, Inc.	Office	Planned	Unknown	Unknown
Continuing Care Facility	Offices	Planned	Unknown	Unknown
Research Park	Office	Planned	Unknown	Unknown
Montgomery Five	6 Apartments	Planned	Unknown	Unknown
Belvedere Homes	17 Homes	Unknown	Unknown	Unknown
Sourland View	8 Homes	Unknown	Unknown	Unknown
JER/Herring Orchard Community	152 Apartments	Unknown	Unknown	Unknown

[a] Project is discussed in the Cumulative Impacts section of this EA (see section 2.10).

Because Transco would construct the Project adjacent to its existing pipelines for the majority of its length, the placement of structures over the permanently maintained right-of-way has already been precluded. Transco has been in contact with the developers and permitting authorities of projects in the area and would continue to coordinate with them to identify any potential conflicts associated with the construction and operation of the Project. Certain projects identified in the table are discussed further in the Cumulative Impacts section of this EA (see section 2.10).

2.4.5 Recreation and Special Interest Areas

The Project would affect recreation and special land use areas as listed in table 2.4.5-1.

Many commentors, including agencies, Montgomery Township, the Municipality of Princeton, and several landowners within the Project areas, expressed concern about the impact of construction on the purpose for which a recreation or special interest area was established (e.g., the recreational activities, public access, and resources the area aims to protect). Construction would alter visual aesthetics by removing existing vegetation and disturbing soils. Construction would also generate dust and noise, which could be a nuisance to recreational users. Project activity could also interfere with or diminish the quality of the recreational experience by affecting wildlife movements or disturbing trails.

Collectively, the Project would impact about 123 acres of recreational and special interest areas during construction. Operation of Transco's permanent right-of-way would affect about 31.2 acres. In general, Project impacts on recreational and special interest areas occurring outside of forest land would be temporary and limited to the period of active construction, which typically would last only several days to several weeks in any one area. These impacts would be minimized by implementing Transco's Plan and Procedures. Also, Transco would secure easement agreements from landowners to construct and operate the Project, and would apply for permits as necessary and comply with any permit requirements when crossing these areas.

TABLE 2.4.5-1

Recreation and Special Use Areas Affected by the Project [a]

Loop/ Begin Milepost	End Milepost	Owner	Name of Area	Const. Impacts (acres)	Op. Impacts (acres)	Add. Temp. Workspace (acres)	Yards (acres)
Skillman Loop							
1776.9	1776.9	Local – Recreation	Township of Princeton	0.0	0.0	0.0	0.0
1776.8	1778.1	State Environmental Planning Area	New Jersey Environmentally Sensitive Area	7.0	2.3	0.4	5.3
1776.8	1777.5	National Heritage Grid Program	Vernal Pool Habitat	9.3	6.5	0.1	5.3
1776.9	1776.9	City	Coventry Farm Park	0.1	0.1	0.0	0.0
1779.9	1780.3	City	Dale	5.8	2.0	1.5	0.0
1778.8	1779.0	Private Conservation Land	PresFarm-Easement Purchase – County	3.9	1.9	1.9	0.0
1779.2	1779.3	Private Conservation Land	PresFarm-Easement Purchase – County		Combined with above		
1782.8	1782.8	Private Conservation Land	PresFarm-Easement Purchase – County		Combined with above		
1179.9	1780.3	Local – Recreation	Township of Montgomery	5.8	2.0	1.5	0.0
1780.3	1780.3	State – Recreation	New Jersey Department of Human Services	0.2	0.1	0.0	0.0
1780.3	1780.5	Local – Recreation	Somerset County	2.4	0.8	0.7	0.0
1781.9	1782.1	Local – Conservation	Township of Montgomery	1.3	0.3	0.0	0.0
1782.5	1782.7	Local – Conservation	Township of Montgomery	0.9	0.2	0.4	0.0
1782.8	1783.0	County – Conservation	Somerset County	1.9	0.7	2.7	0.0
1783.0	1783.0	County – Conservation	Somerset County	2.3	0.8	1.5	0.0
Pleasant Run Loop							
1.6	1.7	Readington Township	Best Valley Realty	1.1	0.4	0.5	0.0
2.8	2.8	Readington Township	Lane Farm Open Space	<0.1	<0.1	0.0	0.0
1.2	1.3	New Jersey Environmentally Sensitive Area	New Jersey Environmentally Sensitive Area	0.3	0.1	0.2	0.0
1.8	1.8	City	Craig Road	<0.1	0.0	0.0	0.0
2.7	2.8	City	Lane Farm Easement	1.2	0.4	0.4	0.0
0.3	1.2	Private Conservation Land	PresFarm-Easement Purchase – County	16.6	6.9	3.5	0.0
3.7	3.9	Private Conservation Land	PresFarm-Easement Purchase – County		Combined with above		
4.7	4.9	Private Conservation Land	PresFarm-Easement Purchase – County		Combined with above		
2.6	2.6	Private Conservation Land	PresFarm-Eight Year - Farmland Preservation	3.0	0.9	0.5	0.0
3.5	3.7	Private Conservation Land	PresFarm-Eight Year - Farmland Preservation		Combined with above		
5.7	5.7	Private Conservation Land	PresFarm-Eight Year - Farmland Preservation		Combined with above		
5.2	5.7	Private Conservation Land	PresFarm-PIG Easement Purchase – Municipal	7.1	2.2	2.1	4.6
5.9	6.0	City	Greenway Incentive Plan	1.4	0.4	0.3	0.0
6.0	6.0	City	Burgher Farm	0.1	0.0	0.0	0.0
6.0	6.2	City	The Bloys Farm	2.0	0.6	0.3	0.0
6.0	6.5	Local – Recreation	Readington Township	1.8	0.5	0.3	0.0
6.2	6.5	City	Bouman-Stickney Museum	3.8	1.1	1.1	0.0

TABLE 2.4.5-1

Recreation and Special Use Areas Affected by the Project [a]

Loop/ Begin Milepost	End Milepost	Owner	Name of Area	Const. Impacts (acres)	Op. Impacts (acres)	Add. Temp. Workspace (acres)	Yards (acres)
6.8	6.9	Highlands Region Planning Area	Highlands Planning Area	1.2	0.3	0.0	0.5
6.7	6.9	New Jersey Environmentally Sensitive Area	New Jersey Environmentally Sensitive Area	2.6	0.9	0.2	0.0
Franklin Loop							
1.0	61.1	Non-Profit	Pocono Lake Preserve	0.0	0.0	0.2	0.0
58.8	59.4	Non-Profit – The Nature Conservancy	Adams Swamp	7.2	3.0	0.7	0.0
63.7	64.0	Non-Profit – The Nature Conservancy	Thomas Darling Preserve at Two-Mile Run	3.1	1.2	0.1	0.0
Dorrance Loop		No Public Land or Recreation Areas					
			Project Total	**93.4**	**31.2**	**13.8**	**15.8**

[a] Some areas have multiple managements and ownerships and, therefore, may be represented multiple times within overlapping milepost ranges.

Following construction, most open land uses would be able to revert to their former uses. Forest land affected by the temporary construction right-of-way and ATWS areas, however, would experience long-term impacts because of the time required to restore the woody vegetation to its preconstruction condition. Further, forest land within the permanent right-of-way would experience permanent impacts because a portion would be maintained in an herbaceous state.

In addition to the areas affected by the pipeline loops listed in table 2.4.5-1, modification activities at six compressor stations would be within 0.25 mile of recreation and special interest areas, as listed in table 2.4.5-2. Direct impacts on these areas would not occur. While noise and visual impacts would occur, they would be temporary and limited to the time of construction. Furthermore, the compressor stations are existing facilities and, therefore, modifications would be consistent with the existing facilities' appearance and location.

TABLE 2.4.5-2

Recreation and Special Interest Areas within 0.25 Mile of Compressor Stations Associated with the Project [a]

Compressor Station	Name of Area	Ownership/ Designation
205	Central Stony Brook	USGS Protected Areas
205	Delaware & Raritan Greenway	USGS Protected Areas
515	PA State Games Land 091	PAGC
515	Lackawanna State Forest	PADCNR
517	Pennsylvania Wildlife Management Area	PAGC
520	Pennsylvania Wildlife Management Area	PAGC
520	Pine Creek	Pennsylvania Wilds
185	Manassas National Battlefield Park	National Park Service
	Ben Lomond Regional Park	Prince William County Park Authority

Modifications to other Project facilities would not affect recreation or special interest areas.

We received comments concerning the impacts of the Project on two special use areas, the Princeton Ridge and Green Acres Program. These special use areas are more fully described below.

Princeton Ridge

As discussed throughout this EA, numerous comments were received from stakeholders in the Princeton Ridge area, including from a group of affected landowners and concerned citizens referred to as the Princeton Ridge Coalition, the Municipality of Princeton, and other non-governmental organizations.

The Princeton Ridge is an upland area in Mercer County that extends westward from the Millstone River and the Delaware and Raritan Canal State Park across the northern part of Princeton Township into Hopewell (New Jersey Conservation Foundation, 2014). The area consists of forest and wetland habitat that support several endangered and threatened species and numerous other wildlife species (see sections 2.3.3 and 2.3.2, respectively).

As described in section 1.6.2, the Skillman Loop would impact two state designated Planning Areas within the Princeton Ridge: Fringe Planning Area 3 (F3) and Environmentally Sensitive Planning Area 5 (ESA 5) (see figure 2.4.5-1). The Skillman Loop would cross F3 designated land between MPs 1776.8 and 1777.6 (0.8 mile) and ESA 5 designated land between MPs 1777.6 and 1778.1 (0.5 mile).

A Fringe Planning Area is identified as an area for Limited Growth or an Area for Conservation (State Plan, 2001). More specifically, it is intended to:

> *Accommodate growth in Centers; protect the Environs primarily as open lands; revitalize cities and towns; protect the character of existing stable communities; protect natural resources; provide a buffer between more developed Metropolitan and Suburban Planning Areas and less developed Rural and Environmentally Sensitive Planning Areas; and confine programmed sewers and public water services to Centers* (New Jersey State Planning Commission, 2001).

A Fringe Planning Area is characterized as rural with scattered small communities and some residential and commercial/industrial developments, and areas that are not prime agricultural or environmentally sensitive, but which can provide a buffer between ESA 5 lands and more developed areas.

An Environmentally Sensitive Planning Area is identified as an area for Limited Growth or an Area for Conservation (State Plan, 2001). More specifically, it is intended to:

> *Protect environmental resources through the protection of large contiguous areas of land; accommodate growth in Centers; protect the character of existing stable communities; confine programmed sewers and public water services to Centers; and revitalize cities and towns* (New Jersey State Planning Commission, 2001).

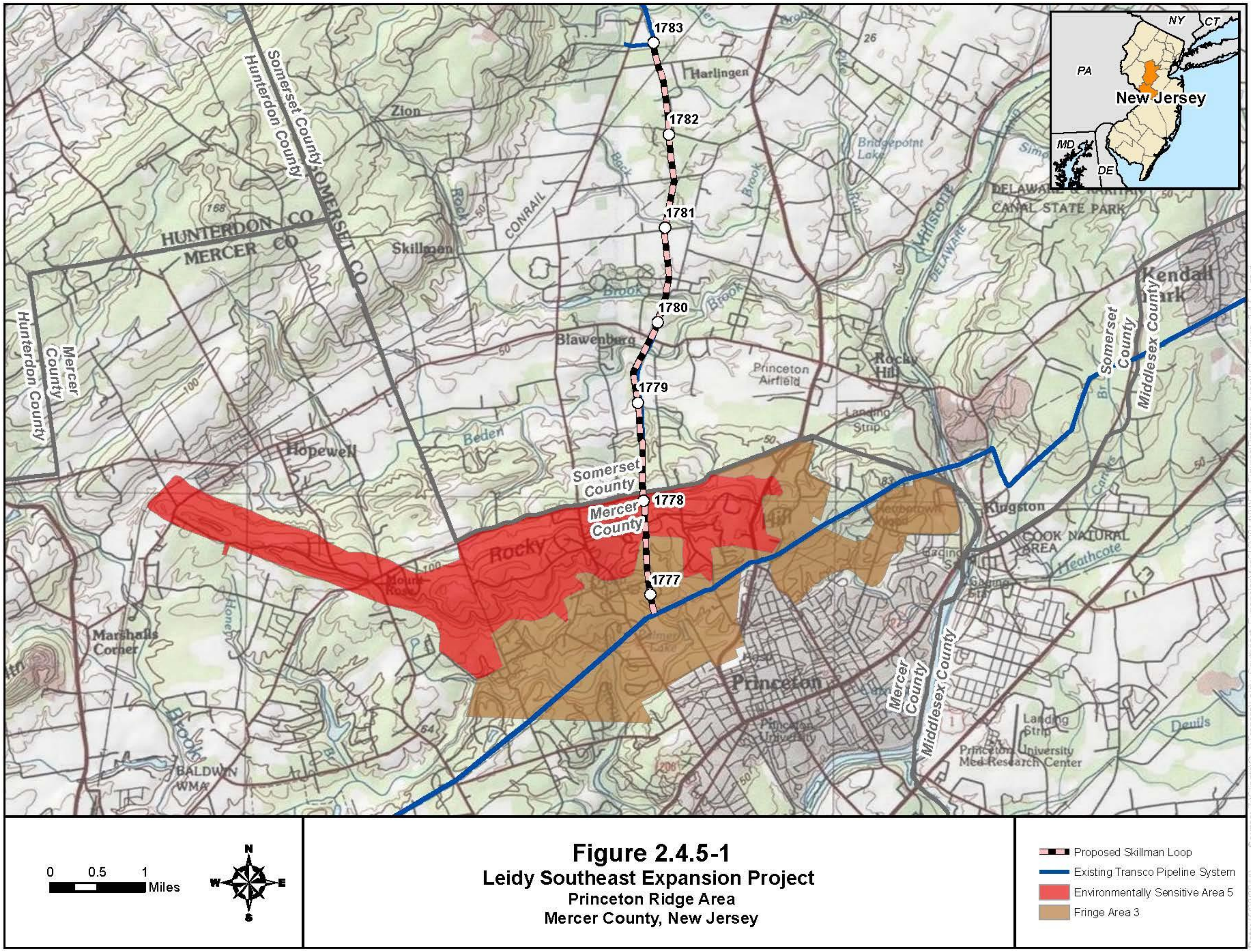

Figure 2.4.5-1
Leidy Southeast Expansion Project
Princeton Ridge Area
Mercer County, New Jersey

An Environmentally Sensitive Planning Area consists of large contiguous land areas with valuable ecosystems, geological features, and wildlife habitats. These areas are characterized by "watersheds of pristine waters, trout streams and drinking water supply reservoirs; recharge areas for potable water aquifers; habitats of endangered and threatened plant and animal species; coastal and freshwater wetlands; prime forested areas; scenic vistas; and other significant topographical, geological or ecological features, particularly coastal barrier spits and islands (State Plan, 2001)."

Due to the state environmental designation of the Princeton Ridge area and in response to scoping comments, Transco developed site-specific construction and restoration plans with input from stakeholders in the area. These plans describe the environmental and geotechnical investigations conducted by Transco and identify measures that would be implemented to minimize impacts in the Princeton Ridge area, as well as protect the integrity of the existing pipeline before and after construction. The Rock Handling Plan and PRCRP are discussed in sections 1.6.2, 2.1.1, 2.3.1, and 2.9.1, and are available for review on our website. To minimize impacts, Transco would reduce the offset between the existing and proposed pipelines to typically 20 feet, and limit the width of the construction right-of-way to 50 feet (with few exceptions), as compared to 105 feet typically proposed for the remaining Project loops. As a result of the reduced workspace, construction of the Skillman Loop would affect approximately 13.6 acres of forest, wetlands, and open land on the Princeton Ridge.

Following construction, the temporary workspace and operational right-of-way would be restored and maintained in accordance with the PRCRP and other permit conditions that may apply. The permanent right-of-way for the new pipeline would not preclude recreational uses of the area.

Green Acres Program

Publicly and privately held Green Acres Program properties would be crossed by the Skillman and Pleasant Run Loops at various locations as listed in table 2.4.5-3.

New Jersey created the Green Acres Program in 1961 to address the state's growing recreation and conservation requirements. The goal of the Green Acres Program is to create a network of open spaces and recreational resources for public use and enjoyment. The regulations for the program and for Green Acres properties are provided in Title 7, Chapter 36 of the NJAC (NJAC, 2011b).

Construction of the Project would temporarily affect about 44.6 acres of publically and privately held Green Acres Program properties. The Skillman and Pleasant Run Loops would be adjacent to Transco's existing right-of-way for the majority of its length and, therefore, the construction right-of-way would overlap onto previously disturbed and existing right-of-way, thus reducing the area of new impact. Following construction, Transco would restore the right-of-way to preconstruction conditions. About 9.3 acres would be affected by operation of the permanent right-of-way; however, recreational uses would be allowed to continue during pipeline operation.

TABLE 2.4.5-3

Green Acres Areas Crossed by the Project (acres)

Loop	Mileposts	Const. Impacts	Op. Impacts	Additional Temp. Workspace	Construction Yards	Access Roads
Skillman Loop						
	1776.8 – 1776.9	0.4	0.1	0.1	5.3	0.8
	1776.9 – 1776.9	0.0	0.0	0.0	0.0	0.0
	1778.3 - 1778.6	1.5	0.5	0.1	0.0	0.0
	1778.1 – 1778.6	4.3	1.5	3.5	0.0	0.0
	1779.4 – 1779.6	2.8	1.2	0.9	0.0	0.0
	1779.5 – 1779.6	<0.1	0.0	0.0	0.0	0.0
	1779.5 – 1779.7	1.7	0.8	0.4	0.0	0.0
	1779.9 – 1780.3	5.8	2.0	1.5	0.0	0.0
	1782.5 – 1782.7	1.9	0.7	2.7	0.0	0.3
Pleasant Run Loop						
	2.7 – 2.8	1.2	0.4	0.4	0.0	0.0
	2.8 – 2.8	0.2	0.1	0.0	0.0	0.0
	5.9 – 6.1	1.5	0.4	0.3	0.0	0.0
	6.1 – 6.1	0.1	0.0	0.0	0.0	0.0
	6.1 – 6.2	1.8	0.5	0.3	0.0	0.0
	6.2 – 4.8	3.8	1.1	1.1	0.0	0.0
	Project Total	**27.0**	**9.3**	**11.2**	**5.3**	**1.1**

Transco would mitigate Project impacts in accordance with the requirements of the Green Acres Program, which include identifying land that would provide opportunities for the preservation of permanent outdoor recreation areas for public use and enjoyment, and maintaining public access to the properties without discrimination or exclusion based on residency.

We received comments from Montgomery Township regarding impacts on Green Acres parcels, some of which are owned in fee by the Township and others that are privately owned and held by the Township as Green Acres restricted conservation easements. Transco has consulted with Montgomery Township and has identify a number of measures it would implement during construction to reduce impacts on the parcels. These include reducing the typical construction right-of-way width from 105 feet to 85 feet in forested areas crossed on the parcels, implementing measures to reduce the spread of noxious weeds, and consulting with the Township and Somerset County Soil Conservation District to identify an appropriate native seed mix for restoration. Transco is also discussing compensation for impacts on Green Acres restricted parcels with the Township, including possible replacement parcels identified by the Township or monetary compensation that could be used by the Township to acquire replacement land. In addition, Transco's proposed HDD, requested by Montgomery Township, would avoid or reduce impacts on a Green Acres parcel as well as the Waldorf School, Bedens Brook, Back Brook, and nearby residences.

Transco has not received authorization from the NJDEP to affect Green Acres Program properties. Transco may have additional requirements imposed on it by the NJDEP and other state agencies charged with regulating activities within Green Acres properties. These additional

requirements may have implications on Transco's proposed construction methods and restoration measures and, therefore, **we recommend that:**

- **Prior to construction of the Skillman and Pleasant Run Loops, Transco should file with the Secretary an updated status of its consultation with the NJDEP to construct and operate its pipeline and associated facilities within Green Acres Program properties. Transco should include copies of all correspondence, including any additional requirements imposed by the NJDEP.**

2.4.6 Coastal Zone Management Act

Based on a review of the respective state Coastal Zone Management programs and coastal zone maps, the Project falls outside of the geographical boundaries of the New Jersey, Pennsylvania, and North Carolina Coastal Zones and, therefore, is not subject to coastal zone consistency review in these states (PADEP, 2013a; NJDEP 2013a; North Carolina Division of Coastal Management, 2007). Portions of the Project in Virginia and Maryland are, however, within a coastal zone, and are discussed further below.

Virginia

Based on a review of the Virginia Coastal Management Program coastal zone maps, the existing facility modifications proposed at Compressor Station 185, Nokesville Meter Station, Pleasant Valley Meter Station, Herndon Meter Station, Bull Run Meter Station, Prince William Meter Station, MLV 185-05, MLV Cove Point, MLV 185-10, MLV 185-13, Receiver V297, and MLV Potomac South would be within the Virginia Coastal Zone (VDEQ, undated).

Transco has initiated consultation with the Virginia Coastal Program of the VDEQ regarding its proposed modifications at existing aboveground facilities. Transco anticipates that the Project would be consistent with the policies and intent of the Virginia Coastal Zone Program; however, no response has been provided to date.

Maryland

Based on a review of the Maryland Coastal Management Program coastal zone maps, the facility modifications proposed at existing MLV 190-10, existing MLV 190-13, and MLV 190-20 would be within the geographical boundaries of the Maryland Coastal Zone (Maryland Department of Natural Resources [MDNR], undated).

Transco has initiated consultation with the Chesapeake Bay and Coastal Programs of the MDNR regarding its proposed modifications at aboveground facilities. Transco anticipates that the Project would be consistent with the policies and intent of the Maryland Coastal Zone Program; however, no response has been provided to date. Therefore, **we recommend that:**

- **Prior to construction, Transco should file with the Secretary a copy of the determination of consistency with the Coastal Zone Management Programs of the VDEQ, and the Chesapeake Bay and Coastal Programs of the MDNR.**

2.4.7 Hazardous Waste

As stated in sections 2.1.2 and 2.2.1, Transco reviewed federal and state regulatory databases to identify known and potential water and soil contamination and hazardous waste sites within 0.25 mile of the Project. Based on these results several sites of potential contamination were identified in the Project area:

- Skillman Loop – seven sites were identified within 0.25 mile of the Project;
- Pleasant Run Loop – six sites were identified within 0.25 mile of the Project;
- Franklin Loop – seven sites were identified within 0.25 mile of the Project; and
- Dorrance Loop – no sites were identified within 0.25 mile of the Project.

In addition, potentially contaminated sites were identified within 0.25 mile of existing Compressor Stations 520, 515, 517, 190, 185, 180, 185, 175, and 165.

Based on our review of the environmental databases and alignment sheets, the Project would not cross any potentially contaminated sites. However, Transco is currently consulting with the state project managers to determine if construction activities associated with the Project may interfere with investigation and/or remediation efforts. In addition, Transco has developed an Unanticipated Discovery of Contamination Plan, which includes measures that it would implement in the event contaminated media is encountered during construction. We have reviewed Transco's Unanticipated Discovery of Contamination Plan and find it acceptable.

2.4.8 Visual Resources

Pipeline Facilities

Most visual and aesthetic impacts associated with the Project would be limited to the period of active construction, in which the landscape would be characterized by areas of cleared or flattened vegetation, trench excavation, grading, and spoil storage. Although stretches of upland forest are present along the proposed routes, the majority of the pipeline loops (about 99 percent) would be installed within or parallel to existing rights-of-way where the upland forest has already been cleared. These existing rights-of-way are maintained periodically on different schedules, using different methods of maintenance. As a result, along the majority of the Project, visual resources have been previously affected by other activities.

Visual impacts associated with the construction right-of-way and ATWS include the removal of existing vegetation and the exposure of bare soils. Other visual effects could result from the removal of large individual trees that have intrinsic aesthetic value; the removal or alteration of vegetation that may currently provide a visual barrier; or landform changes that introduce contrasts in visual scale, spatial characteristics, form, line, color, or texture.

Visual impacts are typically greatest where the pipeline routes parallel or cross roads and may be seen by passing motorists, and on residences where vegetation used for visual screening of existing utility rights-of-way or for ornamental value would be removed. The duration of visual impacts would depend on the type of vegetation that is cleared or altered. The impact of vegetation clearing would be shortest in areas consisting of short grasses and scrub-shrub vegetation and in agricultural crop and pasture lands, where the re-establishment of vegetation following construction would be relatively fast (generally less than 3 years). The impact would

be greater in forested lands, which would take many years to regenerate mature trees. The greatest potential visual impact in forested lands would result from the removal of large specimen trees, which would take longer than other vegetation types to regenerate and would be prevented from re-establishing on the permanent right-of-way. This would result in a long-term to permanent impact within the permanent right-of-way where forest land would be replaced with open land consisting of grasses and shrubs.

Because the Project is one that would expand existing rights-of-way, the visual impact on motorists who observe road crossings would be minor. In locations where trees that serve as a visual buffer would be removed, Transco would discuss these screening issues with individual landowners during easement negotiations. In areas where all visual screening would be removed, Transco has stated that it would consider strategic planting of fast-growing evergreens at the landowner's request.

After construction, all disturbed areas would be restored and returned to preconstruction conditions in compliance with federal, state, and local permits; landowner agreements; and Transco's easement requirements, with the exception of aboveground facility sites, discussed further below.

Aboveground Facilities

Proposed modifications at existing compressor station sites and other aboveground facility locations associated with the Project would occur mainly within the property line at the already developed sites and/or would result in minor, temporary impacts outside the existing fence line. No permanent changes to the current visual landscape are anticipated as a result of modifications to existing aboveground facilities beyond what is already experienced at the sites.

The new aboveground facilities associated with the Project would be the most visible features and would result in long-term impacts on visual resources. New aboveground facilities include new MLVs and pig launcher/receiver sites. The magnitude of these impacts depends on factors such as the existing landscape, the remoteness of the location, and the number of viewpoints from which the facility could be seen, as discussed in table 2.4.8-1.

New pig launchers and receivers would be associated with the MLV sites discussed above. One bi-directional launcher/receiver, at MLV200D28, would be removed from its current location. The site would be reclaimed to correspond with surrounding vegetation and landscape.

Transco does not propose to visually screen the new facilities. The new MLVs would be located below ground, while the blowdown piping and valve operator would be aboveground and, in general, enclosed by 50 feet by 50 feet of 7-foot-tall perimeter fence.

In general, construction and operation of the aboveground facilities would result in a minor long-term to permanent impact on the surrounding existing commercial/industrial and developed (residential) visual character of the Project area. However, impacts are not considered significant given the nature of the developed visual character of the area and/or vegetation screening.

TABLE 2.4.8-1

Visual Conditions at Proposed Mainline Valve and Launcher/Receiver Modifications [a]

Facility	Milepost	Location Conditions
Proposed MLV200D27	Caldwell 1776.8	Facility would be installed at existing MLV sites and, therefore, would be consistent with the existing facility.
Proposed MLV505LC11	Leidy Line 0.1	Facility would be installed at existing MLV sites and, therefore, would be consistent with the existing facility.
Proposed MLV505LD90	Leidy Line 57.5	Facility would be located adjacent to State Route 4002 (Long Pond Road). The site consists of open land. A residence and surrounding structures is located about 300 feet north of the site. Visual impacts of the MLV on the residence would be lessened by a small patch of existing trees on the south side of the residence.
Proposed MLV505LD at MP 63.19	Leidy Line 63.2	Facility would be located adjacent to Burger Road. The site consists rural/wooded areas and is approximately 25 feet northwest of wetland WW-001-031 and 600 feet northwest of stream SS-001-021. One residence is located about 220 feet southwest of the site. Visual impacts of the MLV on the residence would be buffered by existing trees.
Proposed MLV515LD0	Leidy Line 69.0	Facility would be located near State Highway 115 (Buck Boulevard). The site consists of commercial/industrial land within Transco's existing Compressor Station 515. Therefore, the MLV visual impacts would be consistent with current conditions. The new MLV would be screened from view by the existing structures within the site as well as surrounding trees screening.
Proposed MLV515LD at MP 17.70	Leidy Loop Line 17.7	Facility would not be located adjacent to any existing roads. The site consists of generally open land within and adjacent to Transco's existing pipeline right-of-way, and is surrounded by shrub-scrub land and patches of forest land.
Proposed MLV515LD at MP 22.97	Leidy Loop Line 23.0	Facility would be located near Cemetery Road. The site consists of generally open land within and adjacent to Transco's existing pipeline right-of-way, and is surrounded by shrub-scrub land and patches of forest land.

[a] See table 1.2.2-2 for the scope of work proposed at each facility.

Contractor/Pipe Storage Yards and Contractor Staging Areas

The primary visual impact associated with the proposed contractor/pipe storage yards and contractor staging areas would be the storage of equipment, materials, and heavy machinery during Project construction. All of these uses would be temporary and expected to last the duration of construction, which Transco has estimated to be approximately 7 to 10 months. The contractor/pipe storage yards and contractor staging areas would generally be located in existing fields and other previously disturbed areas. Upon completion of construction, the contractor/pipe storage yards and contractor staging areas would be restored in accordance with Transco's Plan and Procedures. As a result, there would be no permanent impacts on visual resources associated with the use of these yards.

Use of the contractor/pipe storage yards and contractor staging areas would result in a minor and temporary impact on the surrounding commercial/industrial and agricultural visual character of the Project area.

Access Roads

In addition to using existing public roads, Transco proposes to build 5 new access roads and modify 18 private roads for temporary or permanent right-of-way access during construction or permanent aboveground facility access during operations (see appendix B). The existing private access roads are asphalt, gravel, or dirt roads that may be improved as needed for construction and operations/maintenance. Twelve of the roads to be modified are existing and,

therefore, use as access roads would not result in significant increased impacts on visual resources. Three proposed new temporary roads would not result in a significant impact on visual resources as they would be restored following construction. However, new permanent visual impacts would result from the modification or construction of eight access roads.

While the establishment of the new permanent access roads would be permanent, due to the generally developed nature of the Project area, the new roads would not be inconsistent with similar roadways in the area. Therefore, construction and, where applicable, permanent use of the access roads would not result in a significant impact on visual resources in the area.

2.5 SOCIOECONOMICS

Construction and operation of the Project could impact socioeconomic resources in the area. Some of these potential effects are related to the number of construction workers that would work on the Project and their impact on population, public services, and temporary housing during construction. Other potential effects are related to construction, such as increased traffic or disruption of normal traffic patterns. Other effects associated with the Project include increased property tax revenue, increased job opportunities, and increased income associated with local construction employment. The primary potential socioeconomic effects of the Project would be from construction and operation of the Skillman, Pleasant Run, Franklin, and Dorrance Loops. The aboveground facilities associated with the Project would occur within existing facilities or developed rights-of-way and represent relatively minor activities. Therefore, construction and operation of these facilities would not have a significant socioeconomic impact.

2.5.1 Population, Economy, and Employment

Table 2.5.1-1 provides a summary of selected demographic and socioeconomic conditions for affected communities in the Project area.

Construction of the Project would temporarily increase the population in the general Project area. Pending Commission approval, Transco plans to begin construction activities for the Project in October 2014 with initial winter tree clearing and pipeline loop construction beginning in April 2015. Transco proposes to place the Project facilities in service by December 2015.

Transco estimates that the four pipeline loop segments including aboveground facility installation or modifications would require a total of eight construction spreads. Transco would employ an average of about 300 to 450 construction workers for the pipeline loops, and an average of about 25 to 60 construction workers for the compressor station modifications. Each spread would take approximately 7 to 10 months to complete, and peak construction would occur between March and October 2015. Compressor station modifications would take approximately 3 to 9 months and begin in February 2015.

Operation of the new and modified facilities would be conducted by Transco personnel who operate existing facilities.

TABLE 2.5.1-1

Existing Economic Conditions in the Vicinity of Select Project Facilities

State/County	Population [a]	Population Density (Persons/sq. mile) [a, b]	Per Capita Income [a, c]	Civilian Workforce [d]	Potential Const. Labor Force [e]	Unemploy-ment Rate (percent) [d]	Top Three Industries [d]
New Jersey	8,791,894	1,185	34,090	4,662,195	129,700	10.9	Educational, health, and social services
Mercer	366,513	1,632	36,602	197,137	4,900	10.8	Educational, health, and social services
Somerset	323,444	1,071	46,041	177,191	297,100	7.7	Educational, health, and social services
Hunterdon	128,349	299	44,831	70,799	297,100	7.1	Educational, health, and social services
Pennsylvania	12,702,379	283	26,933	6,458,914	221,800	9.4	Educational, health, and social services
Monroe	169,842	279	22,444	86,881	9,600	16.9	Educational, health, and social services
Luzerne	320,918	360	23,796	160,437	9,600	8.0	Educational, health, and social services

[a] 2010 Census data (U.S. Census Bureau, 2010)
[b] 2000 Census data (U.S. Census Bureau, 2000)
[c] U.S. Census Bureau State and County QuickFacts (U.S. Census Bureau, 2013)
[d] 2011 American Community Survey (One-Year Estimates) data (U.S. Census Bureau, American Community Survey, 2011)
[e] "Construction" and "Mining, Logging, and Construction" Occupations per the Standard Occupational Classification System, Department of Labor, Bureau of Labor Statistics, 2011. Data are for the metropolitan area/division for each portion of the Project:
Dorrance Loop - the Scranton--Wilkes-Barre, Pennsylvania metropolitan area
Franklin Loop - the Scranton--Wilkes-Barre, Pennsylvania metropolitan area
Pleasant Run Loop - the New York-Northern New Jersey-Long Island metropolitan area
Skillman Loop - the New York-Northern New Jersey-Long Island metropolitan area and the Trenton-Ewing, New Jersey metropolitan area

The construction workforce would include both local and non-local workers, of which approximately 50 percent would be local. Transco, through its construction contractors and subcontractors, may hire local construction workers that possess the required skills and experience into the Project workforce. Project-area population impacts are expected to be temporary and proportionally small. The total population change would equal the total number of non-local construction workers plus any family members accompanying them. Given the brief construction period and in our experience, most non-local workers would not be expected to be accompanied by their families. Based on the county populations within the Project area, the additional people that might temporarily relocate to the area would not result in a significant change. Additionally, this temporary increase in population would be distributed throughout the pipeline loops and would not have a permanent impact on the population. A brief decrease in the unemployment rate could occur as a result of hiring local workers for construction and increased demands on the local economy.

Transco conducted an economic impact analysis, which estimated that the Project would provide 842 direct job-years of employment in Pennsylvania and New Jersey (Seneca et al., 2013). A job-year "…is defined as one job lasting one year. This measurement captures the fact that construction jobs generate economic impacts, including employment, that persist mainly for the length of time that money is spent on the specific project" (Seneca et al., 2013). Of the total

number of direct job-years potentially generated by the Project, approximately 574 job-years would be in Pennsylvania and 267 job-years would be in New Jersey (Seneca et al., 2013).

Temporary housing availability varies seasonally and geographically within the counties and communities near the proposed facilities and is available in the form of daily, weekly, and monthly rentals in motels, hotels, and campgrounds. The demand for temporary housing in the Project area is generally greatest during the summer months when tourism is at its highest. Other available temporary housing such as bed and breakfast facilities, apartments, and vacation properties, as well as those in other towns/cities within commuting distance of the Project area (e.g., Scranton-Wilkes-Barre, Pennsylvania and Trenton, New Jersey) are not included. Therefore, the availability of temporary housing is substantially greater than presented in table 2.5.1-2.

TABLE 2.5.1-2

Housing Statistics by County in the Vicinity of Select Project Facilities

State/County	Total Housing Units [a]	Units for Seasonal, Recreational, or Occasional Use [b]	Rental Vacancy Rate (percent) [a]	Hotels/Campgrounds [b]
New Jersey				
Mercer	143,169	558	8.5	28/0
Somerset	123,127	730	6.1	37/2
Hunterdon	49,487	512	5.9	16/7
Pennsylvania				
Monroe	80,359	13,590	9.5	66/16
Luzerne	148,748	3,412	8.4	36/15

[a] Based on 2010 Census data (U.S. Census Bureau, 2010).
[b] Google Earth, 2013.

Construction of the Project could affect the availability of housing in the Project area. The Project would likely have a short-term positive impact on the area rental industry through increased demand and higher rates of occupancy; however, no significant impacts on the local housing markets are expected. Construction activities may occur during the peak tourism season. Also, current activities in the Project area such as Marcellus Shale drilling have resulted in temporary housing being more difficult to find and/or more expensive to secure, which could require workers to commute to the work area from greater distances. No new permanent housing would be needed by Transco because no additional permanent employees would be hired for Project operations.

2.5.2 Public Services

A wide range of public services and facilities are offered in the counties crossed by the Project including trauma and medical centers, full-service law enforcement, paid and volunteer fire departments, and schools. Each county in the socioeconomic impact area has its own sheriff's department and numerous fire departments. In addition, each county has multiple school districts operating their own public school systems and a few regional schools.

The number of non-local workers and associated family members anticipated to enter the area would likely be small relative to the current populations in the Project area (see table 2.5.1-

1). This would result in minor, temporary, or no impact on local community facilities and services, such as police, fire, and medical services. The counties, cities, and towns in the Project vicinity presently have adequate infrastructure and services to meet the needs of the non-local workers and family members.

Short-term impacts on public services could include the need for localized police assistance to control traffic flow during construction. Also, construction-related injuries could occur as a result of unanticipated accidents or emergencies. In the event of a construction accident, Transco could require police, fire, and medical services, depending on the type of emergency. The anticipated demand for police, fire, and medical services is not expected to exceed the existing capability of the infrastructure in the Project area to provide them, as these services are expected to be used only in emergencies. These emergency services are located in reasonable proximity to the Project area.

We received scoping comments regarding the proximity of the Project to schools. The Skillman Loop would be located within 0.25 mile of three schools:

- the Stuart Country Day School of the Sacred Heart is approximately 370 feet west of the Skillman Loop near MP 1777;
- the Waldorf School of Princeton is approximately 1,280 feet east of the Skillman Loop near MP 1779; and
- the Montgomery Kid Connection School is approximately 1,100 feet east of the Skillman Loop near MP 1780.

Transco has committed to consulting with the administrators of these schools to identify construction measures that would reduce disruption of daily school operations. Such measures may include scheduling major construction activities when the school is not in session. Further, Transco would ensure that all employees on the right-of-way are in compliance with DOT regulations for current and previous drug and alcohol testing records.

Primary impacts on public services would also include temporary increases in demand for retail, recreation, and related services, but we have determined the Project area could support these temporary increases in demand. Additionally, we conclude that the education infrastructure in the vicinity of the Project could accommodate any temporary educational needs of construction worker family members.

2.5.3 Transportation and Traffic

The local road and highway system in the vicinity of the Project facilities consists of interstate highways, U.S. highways, state highways, township highways, county and local roads, and private roads. The Project would also cross two Conrail railroad lines (MPs 1782.8 and 1783.0) along the Skillman Loop. Table 2.5.3-1 lists the road and railroad crossings associated with the Project as well as Transco's proposed crossing method.

TABLE 2.5.3-1

Road and Railroad Crossings Associated with the Project

Loop/Milepost	Name of Road or Railroad	Type	Proposed Construction Method
Skillman Loop			
1777.1	Stuart Road	Paved	Open Cut
1777.3	White Oak Drive	Paved	Open Cut
1777.7	Ridgeview Road	Paved	Open Cut
1778.1	Cherry Valley Road	Paved	Open Cut
1779.8	Georgetown Franklin Turnpike (CR 518)	Paved	HDD
1780.3	Burnt Hill Road	Paved	Bore
1780.5	Dugan Drive/ Main Blvd E	Paved	Open Cut
1781.0	County Road 602 - Skillman Road	Paved	Bore
1781.4	Dublin Road	Paved	Bore
1781.5	Sunset Road	Paved	Bore
1781.8	Concord Lane	Paved	Bore
1781.9	South Street	Dirt	Open Cut
1782.0	Kildee Road	Paved	Bore
1782.2	North Street	Paved	Bore
1782.3	Fisher Farms Road	Paved	Bore
1782.8	Conrail RR (New York Central Lines)	N/A	Bore
1782.8	County Road 604 - West Dutchtown Harlingen Road	Paved	Bore
1783.0	Conrail RR (New York Central Lines)	N/A	Bore
Pleasant Run Loop			
1.4	Old York Road	Paved	Bore
1.6	US Highway 202 (Eastbound)	Paved	Bore
1.6	US Highway 202 (Westbound)	Paved	Bore
1.8	County Road 629- Pleasant Run Road	Paved	Bore
3.3	Locust Road	Paved	Bore
4.0	Barley Sheaf Road	Paved	Bore
5.2	County Road 523 - Flemington-Whitehouse Road	Paved	Bore
5.9	County Road 629 - Stanton Road	Paved	Bore
6.7	Dreahook Road	Paved	Open Cut
6.8	Stanton Mountain Road/Lebanon Road	Paved	Bore
Franklin Loop			
57.5	State Route 4002 - Long Pond Road	Paved	Open Cut
57.7	Cartwright Farm Road	Paved	Open Cut
58.0	Cartwright Road	Unpaved	Open Cut
59.7	Interstate Highway 80 (Eastbound)	Paved	Bore
59.7	Interstate Highway 80 (Westbound)	Paved	Bore
61.5	Lady Joyce Court/Chestnut Road	Paved	Open Cut
61.6	Lady Violet Court/Anna Road	Paved	Open Cut
61.8	State Route 940	Paved	Bore
62.0	Beechwood Road	Paved	Open Cut
62.3	Redwood Road	Paved	Open Cut
62.6	Lidio Road	Paved	Open Cut
63.2	Burger Road	Paved	Open Cut
65.0	Twp Hwy 553 - Caughbaugh Drive	Unpaved	Open Cut
66.5	State Route 2040 - Buck River Road	Paved	Open Cut
Dorrance Loop			
18.6	St. Marys Road	Paved	Open Cut

TABLE 2.5.3-1

Road and Railroad Crossings Associated with the Project

Loop/Milepost	Name of Road or Railroad	Type	Proposed Construction Method
19.4	Blue Ridge Trail - SR3007	Paved	Open Cut
19.9	Georges Road	Unpaved	Open Cut
20.9	T387 - Hollow Rd	Unpaved	Open Cut
22.4	Ruckle Hill Road	Paved	Open Cut
22.9	Cemetery Road	Paved	Open Cut

Most local public roads in the vicinity of the Project are paved. Construction of the Project could result in minor, short-term impacts along some roads and highways due to the movement and delivery of equipment, materials, and workers. Maps included in appendix A depict the roads that Transco would use to access the construction right-of-way; access roads are discussed in greater detail in section 2.4.1.

The Sierra Club and landowners in the Project area expressed concerns with damage to public roads resulting from construction of the Project. Construction of the Project would require installation of pipeline across existing public roadways utilizing the methods described in section 1.6.2. Road crossing permits would be obtained from applicable state and local agencies and would dictate the day-to-day construction activities at road crossings. Transco has committed to consult with local law enforcement and safety officials, and would manage traffic in accordance with traffic control plans required for encroachment permits.

To minimize traffic delays, Transco would establish detours before open cutting roads or would implement other measures to permit traffic flow during construction. Transco's construction contractor would also provide traffic control, including warning signs and/or flagmen, along the roads to ensure safe ingress and egress from the construction right-of-way and at contractor/pipe yards.

The daily commuting of the construction workforce to the Project area could also temporarily affect traffic and create roadside parking hazards. Transco estimates that a maximum of up to about 300 to 450 people would be working on any one pipeline spread at any one time, resulting in a short-term, temporary increase in traffic. However, because pipeline construction work is generally scheduled to take advantage of daylight hours, workers would commute to and from the contractor/pipe yards or other locations during off-peak hours (e.g., before 7:00 a.m. and after 6:00 p.m.). Additionally, construction would move sequentially along the pipeline loops and, therefore, traffic flow impacts would be temporary on any given section of roadway.

In addition to the construction workforce, the delivery of construction equipment and materials to the construction work area could temporarily congest existing transportation networks at specific locations. To minimize disruptions on traffic on local roads, Transco would use multi-lane highways as much as possible to transport heavy construction equipment to the Project workspace. As construction continues along the right-of-way, much of the movement of equipment would occur along the construction right-of-way.

At road crossings, traffic flow would be temporarily interrupted (typically, for 5 to 10 minutes) by the movement of equipment across the road. Traffic flow at these locations would be managed in accordance with the traffic plans that are required for encroachment permits. Transco and its contractors would be required to comply with local weight restrictions and limits, and would attempt to keep roads free of soil that may be deposited by construction equipment. When necessary for equipment to cross roads, mats or other appropriate measures (e.g., sweeping) would be used to reduce deposition of mud.

2.5.4 Property Values

A number of landowners and local government units expressed concern that the construction and operation of an additional pipeline adjacent to Transco's existing pipeline system could adversely impact the ability to sell homes and/or reduce home values.

The effect that a pipeline easement may have on a property value is a damage-related issue that would be negotiated between the landowner and Transco during the easement acquisition process, which is designed to provide fair compensation to the landowner for the company's right to use the property for pipeline construction and operation. In addition, affected landowners who believe that their property values have been negatively impacted could appeal to the local tax agency for reappraisal and potential reduction of taxes. It is not anticipated that the Project would negatively impact property values outside the proposed pipeline rights-of-way or aboveground facility boundaries.

INGAA conducted a national case study to determine if the presence of a pipeline on a piece of property affected the property value or sale price of the property (INGAA, 2001). The study revealed that there was no significant impact on property sales located along natural gas pipelines and that the pipeline size or the product carried did not impact the sale price. The INGAA study also revealed that there were no significant impacts on demand for properties within the geographically diverse areas and that the presence of a pipeline did not impede development of the surrounding properties.

Several other studies examined the effects of pipeline easements on sales and property values and evaluated the impact of natural gas pipelines on real estate. The first study (Diskin et al., 2011) looked at the effects of natural gas transmission pipelines on residential values in Arizona. The study concluded that there was no identifiable systematic relationship between proximity to a pipeline and residential sale price or value.

Studies conducted in 2008 by PGP Valuation Inc. (PGP, 2008) for Palomar Gas Transmission, Inc. and by Ecowest for the Oregon LNG Project (Fruits, 2008) reached similar conclusions. Both studies evaluated the potential effect on property values of a natural gas pipeline that was constructed in 2003/2004 in northwestern Oregon, including along the western edge of the Portland metropolitan area. The PGP study found that:

- there was no measurable long-term impact on property values resulting from natural gas pipelines for the particular pipeline project studied;

- interviews with buyers and brokers indicated no measurable impact on value or price; and

- there was no trend in the data to suggest an extension of marketing periods (i.e., time while the property is on sale) for properties with gas pipeline easements.

The Ecowest study concluded that the pipeline had no statistically significant or economically significant impact on residential properties. The study also concluded that there was no relationship between proximity to the pipeline and sale price. Another study (Hansen et al., 2006) analyzed property sales near a pipeline accident location in Washington State, using methodologies that considered proximity and persistence over time. This study noted a decline in property values following the incident. However, the effect was very localized, and declined as the distance from the affected pipeline increased. The effect also diminished over time in the years following the incident.

Transco also referenced a recent study of the effect of an existing large-diameter natural gas pipeline on home sales in numerous subdivisions in the southwestern U.S. (International Right of Way Online, 2011), which also found no systematic relationship between sale price and value. Some landowners that would be affected by the Project dispute the results of the referenced studies. Many landowners also assert that they would be unable to sell their homes if the pipelines were constructed. Transco's existing system that would be looped as part of this proposal includes numerous locations where residential and commercial facilities were purchased and/or constructed adjacent to the existing system after Transco's original pipeline and subsequent looping were built; whether landowners who would be affected by the Project paid a reduced price due to the presence of Transco's existing facilities in these cases is unknown. However, this demonstrates that homes adjacent to pipelines in the Project area have been successfully sold. Further, the potential effect of the proposed loop segments on property sales and values would be incremental because one to three pipelines already exist in the areas of the proposed loops.

2.5.5 Tax Revenue

Comments were received asserting that the Project would have limited or no economic benefit to the communities that would be affected by Project construction. As previously discussed, the Project would be expected to have a temporary, minor beneficial impact on unemployment rates and the housing rental industry in the area. As discussed below, Transco also provided estimates of local expenditures and the payroll and property taxes that would be paid in conjunction with construction and operation of the Project. In addition, Transco stated that the Project would provide its customers in New Jersey and Pennsylvania with access to natural gas derived from Pennsylvania, and that the close proximity of the natural gas supply may benefit its customers in reduced transportation costs. We note that the price of natural gas in the United States is at a 10-year low, which we attribute in large part to increased domestic production including from non-conventional resources such as the Marcellus Shale in Pennsylvania, New York, and West Virginia.

Transco commissioned the Institute of Public Policy and Economic Development and Rutgers University to assess the economic impacts of the Project in Pennsylvania and New

Jersey, respectively. Transco has made changes to the Project subsequent to the completion of these original studies; however, the estimated economic impact results presented in this EA should be considered a conservative gauge of the magnitude of impacts.

Project construction would result in short-term, beneficial impacts in terms of increased payroll and local material purchases. Transco anticipates that the total payroll for Project construction would be approximately $66.5 million. Because about half of the workers are expected to be non-local workers who would temporarily relocate to the Project vicinity, a substantial portion of the payroll would be spent with local vendors and businesses, resulting in increased state and local sales tax revenues. Payroll taxes would also be collected from the workers employed on the Project in accordance with federal, state, and local tax rates.

Construction of the Project would also result in increased state and local sales tax revenues associated with the purchase of construction materials. While most of the construction materials would be purchased from national vendors, approximately $87.2 million of common supplies (e.g., stone and concrete, automotive supplies) would be purchased, as available, from vendors within the Project area.

For each pipeline loop in Pennsylvania and New Jersey, Transco expects it would pay approximately $15,000 in environmental and building permit fees to the counties in which the Project components would be located. In addition, Transco expects it would pay $125,000 in environmental permit fees to the State of Pennsylvania and $222,000 in environmental permit fees to the State of New Jersey (Seneca et al., 2013).

Once the Project is completed, property taxes would be assessed on the value of the pipeline and related facilities in New Jersey. In Pennsylvania, pipeline properties are exempt from property tax as personal property; therefore, there would be no increase in property taxes as a result of the Project in Pennsylvania. Property tax revenues generated by the Project facilities would be based on the annual assessment multiplied by the local property tax rate. In New Jersey, Transco estimates that the incremental annual property tax increases resulting from operation of the Skillman and Pleasant Run Loops would reflect the following:

- Breakdown by Township/Municipality
    - Branchburg – $80,000
    - Readington – $390,000
    - Clinton – $5,000
    - Princeton – $80,000
    - Montgomery – $350,000
- Breakdown by County
    - Mercer County (Princeton) – $80,000
    - Somerset County (Branchburg/Montgomery) – $430,000
    - Hunterdon County (Readington/Clinton) – $395,000

As such, the increased tax base during Project operation would be a long-term beneficial impact on local governments in New Jersey.

2.5.6 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was signed by the President in 1994. It requires that each federal agency address the potential for disproportionately high and adverse health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. An environmental justice area is defined as an area where the community's minority population is equal to or greater than 50 percent of the community population and/or a community in which the percentage of persons living below the poverty level is higher than the county average, based on poverty statistics published by the U.S. Census Bureau. If a proposed action would result in significant adverse effects to minority or low-income populations or Native American tribes, the NEPA analysis should address those impacts as part of the alternatives analysis and identify appropriate mitigation measures to address the effects.

Each federal agency must also ensure that public documents, notices, and hearings are readily available and accessible to the public. As part of the preparation of this EA, the NEPA review process must provide opportunities for effective community participation and involve consultation with affected communities. As described in section 1.5, several opportunities to comment were provided to affected landowners in the Project areas throughout our environmental review. In addition to scoping meetings and meetings with local officials, FERC staff participated in a site visit at the request of landowners. Consultation with Native American groups is described in section 2.6.2.

Table 2.5.6-1 provides data on minority population and income for all communities affected by the proposed Project, along with data on comparison areas. Per capita income in the vicinity of the Project is provided in table 2.5.1-1.

TABLE 2.5.6-1

Ethnic and Poverty Statistics in the Vicinity of Select Project Facilities

State/County	Percent of Total Population					
	White	Black [a]	Native American [b]	Other Minorities [c]	Hispanic [d]	Percent Below Poverty
New Jersey	**68.6**	**13.7**	**0.3**	**17.4**	**17.7**	**10.4**
Mercer County, NJ	61.4	20.3	0.3	18.0	15.1	11.4
Somerset County, NJ	70.1	8.9	0.2	20.7	13.0	4.6
Hunterdon County, NJ	91.4	2.7	0.1	5.8	5.2	4.0
Pennsylvania	**81.9**	**10.8**	**0.2**	**7.0**	**5.7**	**13.8**
Monroe County, PA	77.2	13.2	0.3	9.3	13.1	14.8
Luzerne County, PA	90.7	3.4	0.2	5.8	6.7	15.5

[a] Black or African American.
[b] American Indian and Alaska Native.
[c] Includes Asian; Native Hawaiian or other Pacific Islander; Some Other Race; and Two or More Races.
[d] Hispanic can be of any race.
Source: 2010 Census (U.S. Census Bureau, 2010).

Based on the U.S. Census Bureau data, minority and low income populations comprise less than 50 percent of the population in the states and counties affected by the proposed pipeline loops. Transco's Project involves looping its existing pipeline system and modifications to its

existing compressor stations and other aboveground facilities and was not chosen based on the ethnicity of the population or economic status. As such, we find that the proposed Project would not disproportionately affect minority or low income populations.

2.6 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the FERC to take into account the effects of its undertakings on properties listed on or eligible for listing on the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Transco is assisting us by providing information, analyses, and recommendations, as allowed by the ACHP's regulations for implementing Section 106 at 36 CFR 800.2(a)(3), and outlined in our Guidelines for Reporting on Cultural Resources Investigations for Pipeline Projects (18 CFR 380.12[f]).

2.6.1 Cultural Resources Investigations

To ensure full coverage of the construction work areas during surveys for cultural resources, Transco surveyed a 200- to 400-foot-wide corridor along the pipeline routes and various reroutes, a 50-foot-wide corridor along access roads, the entire footprints of contractor/pipe storage yards and contractor staging areas, extra work spaces, and certain aboveground facilities. The survey area totaled approximately 996.8 acres.

The investigation included a combination of walkover reconnaissance and shovel testing according to the predictive model of low, medium, and high probability for archaeological discovery. Geomorphologic investigations to evaluate the potential for deeply buried archaeological resources were also completed at waterbody crossings in New Jersey and Pennsylvania. Transco also inventoried aboveground resources adjacent to or within the immediate vicinity of all Project components.

Construction activities at existing Compressor Station 205 in New Jersey; existing Compressor Stations 515, 517, and 520 in Pennsylvania; and other existing facilities in North Carolina and Maryland are covered by Transco's categorical exemptions with the respective State Historic Preservation Offices (SHPOs) and, therefore, were excluded from cultural resources studies. Transco contacted the Virginia SHPO regarding construction activities at the existing Transco facilities in that state. Transco has not yet filed the Virginia SHPO's comments.

New Jersey

Transco completed a Phase I cultural resources identification survey of 442 acres along the Skillman and Pleasant Run Loops, including two contractor/pipe storage yards, four contractor staging areas, eight access roads, and ATWS. Five isolated finds were identified on the Skillman Loop, and two isolated finds were identified on the Pleasant Run Loop. Three previously recorded sites (28HU486, 28HU487, and 28HU488) along the Pleasant Run Loop were not relocated. One historic archaeological site (SK-CY2-HI-012) was identified at a contractor yard, and consists of a predominately late 19th century artifact scatter. The site was recommended for avoidance. Transco removed this contractor yard from the project, thus, the site would be avoided. The seven isolated finds along the Skillman and Pleasant Run Loops

contained very few artifacts and, therefore, were recommended not eligible for the NRHP. Table 2.6.1-1 lists the cultural resources sites identified in New Jersey.

TABLE 2.6.1-1

Cultural Resources Sites Identified in New Jersey

Site Type/Loop/Site Number or Name	Description	Recommendation/ NRHP Status
ARCHAEOLOGICAL SITES		
Skillman Loop		
SK-A-020	Historic isolated find	Not eligible
SK-A-282	Historic isolated find	Not eligible
SK-B-149	Prehistoric isolated find	Not eligible
SK-C-247	Prehistoric isolated find	Not eligible
SK-C-254	Historic isolated find	Not eligible
SK-CY2-HI-012	Historic artifact scatter	Not assessed; Avoided (Yard CY/PY-SK-04 (Alt #1) no longer proposed for use)
Pleasant Run Loop		
PR-D-350	Historic isolated find	Not eligible
PR-A-425	Historic isolated find	Not eligible
28HU486	Historic foundations	Not relocated; Not eligible
28HU487	Prehistoric artifact scatter	Not relocated; Not eligible
28HU488	Historic ice-skating pond	Not relocated; Not eligible
HISTORIC ARCHITECTURAL SITES		
Skillman Loop		
549 Great Road, Princeton	Residence, outbuildings	Potentially eligible
381 Cherry Valley Road, Princeton	Residence	Not eligible
1062 Cherry Hill Road, Princeton	Waldorf School of Princeton, outbuildings	Not eligible
317 Mountain View Road, Montgomery	Residence	Not eligible
Delaware and Bound Brook [Reading] Railroad Historic District (4540)	Historic District	Eligible
New Jersey State Village for Epileptics Historic District (3450), Blawenburg	Historic District	Eligible
Van Middlesworth House (2565), Dutchtown	Residence (within Dutchtown Historic District)	Eligible
Pleasant Run Loop		
659 Case Road, Branchburg	Residence, outbuildings	Potentially eligible
151 Pleasant Run Road, Flemington	Residence, outbuildings	Potentially eligible
127 Pleasant Run Road, Flemington	Residence, outbuildings	Potentially eligible
105-109 Pleasant Run Road, Flemington	Residence, outbuildings	Potentially eligible
101 Pleasant Run Road, Flemington	Residence	Potentially eligible
507 Locust Road, Flemington	Residence, outbuildings	Not eligible
929 County Road 523, Flemington	Residence, outbuildings	Potentially eligible
124 Dreahook Road, Readington	Residence, outbuildings	Potentially eligible
Stanton Rural Historic District (1624), Stanton	Historic District	Listed
Centerville Historic District (4196), Centerville	Historic District	Eligible
Old York Road Historic District (4214), Centerville	Historic District	Eligible
New House (1624.11), Stanton	Residence (within Stanton Rural Historic District)	Listed
White Face Farm (1624.12), Stanton	Residence (within Stanton Rural Historic District)	Listed

TABLE 2.6.1-1

Cultural Resources Sites Identified in New Jersey

Site Type/Loop/Site Number or Name	Description	Recommendation/ NRHP Status
Thomas Bowman House (1624.18), Stanton	Residence (within Stanton Rural Historic District)	Listed
Centerville Tavern (4196.005), Stanton	Residence (within Stanton Rural Historic District)	Listed
Carkhuff #2 (1624.09), Stanton	Residence (within Stanton Rural Historic District)	Listed
J. Pickell House (1624.13), Stanton	Residence (within Stanton Rural Historic District)	Listed
J. Carkhuff House (1624.1), Stanton	Residence (within Stanton Rural Historic District)	Listed
New Houses (1624.14), Stanton	Residence (within Stanton Rural Historic District)	Listed
J.E. Runkle House (1624.19), Stanton	Residence (within Stanton Rural Historic District)	Listed
J. DeMott House (1624.27), Stanton	Residence (within Stanton Rural Historic District)	Listed

Geomorphological field investigations included shovel testing and pedestrian surveys at five crossings, including Beden Brook and Pleasant Run. This study determined that the soils at Beden Brook were disturbed and the probability of deeply buried stratified deposits were low. No additional testing was recommended. Intact buried soils identified at Pleasant Run did not extend into the proposed construction limits and no additional testing was recommended. No buried soils were identified at the remaining three locations and no additional testing was recommended.

Transco provided a Phase I report (Ziesing et al., 2013) to the FERC and New Jersey SHPO. In a letter dated November 20, 2013, the SHPO commented on the report and requested clarifications, revisions, additional information, and additional testing. Transco has not yet provided a revised Phase I report.

Transco's aboveground reconnaissance survey newly identified four aboveground resources more than 50 years of age along the Skillman Loop, which include 19th to 20th century residences, farm outbuildings, and a school administration building (see table 2.6.1-1). Two previously recorded historic districts and one individual property also were inventoried along the Skillman Loop. Eight newly identified and 13 previously recorded aboveground resources, including 3 historic districts and 10 individual properties that contribute to those districts, were investigated along the Pleasant Run Loop. Transco recommended that the Project would have no effect on the view shed, landscape, or building features associated with the NRHP-eligible or -listed historic districts and previously recorded individual properties on the Skillman and Pleasant Run Loops.

Of the 12 newly inventoried aboveground resources along both the Skillman and Pleasant Run Loops, 7 were recommended not eligible for the NRHP. Of the remaining resources, Transco assessed five properties (549 Great Road along the Skillman Loop; and 659 Case Road, 127 Pleasant Run Road, 929 County Road 523, and 124 Dreahook Road along the Pleasant Run

Loop) as potentially eligible and recommended that additional research and intensive-level survey be completed.

The aboveground reconnaissance survey results were submitted to the FERC and the New Jersey SHPO as part of the Phase I report. In comments of March 18, 2014, the SHPO recommended intensive level survey on 549 Great Road on the Skillman Loop, and 101 Pleasant Run Road, 105 Pleasant Run Road, 127 Pleasant Run Road, 151 Pleasant Run Road, 124 Dreahook Road, 659 Case Road, and 929 County Road 523 on the Pleasant Run Loop. Transco indicated it has completed the work on seven of these resources (one was denied access) and would include the results in a revised Phase I report. Transco has not yet provided the revised report.

As discussed in section 2.2.4, Transco would mitigate for Project impacts on wetlands in New Jersey by preserving and/or enhancing wetland habitat in accordance with the NJDEP permitting process. The selection of wetland mitigation site(s) in New Jersey is pending. Transco indicated it would consult the SHPO once the mitigation site(s) are finalized.

Transco has not yet completed cultural resources surveys (due to denied access) for three segments (0.62 mile) and a contractor yard on the Skillman Loop, and seven segments (1.2 miles) on the Pleasant Run Loop.

We received several comments regarding potential cultural resources in New Jersey that may be directly or indirectly affected by the Project, including D&R Canal State Park, Princeton Ridge, and Sourland Mountain; various "cultural and historical sites" in Mercer and Somerset Counties; a pre-revolutionary era homestead; and the historic community of Stanton along the Skillman Loop. The Project would not cross the D&R Canal State Park or Sourland Mountain, thus there would be no direct impacts from the Project on these resources. As discussed in section 2.6.1, Phase I cultural resources survey of accessible properties along the Princeton Ridge segment of the Skillman Loop (MPs 1776.8 to 1778.1) identified a single historic isolated find that was recommended not eligible for the NRHP. The concerns about the potential resources in Mercer and Somerset Counties were also addressed by the archaeological and architectural surveys performed by Transco and are discussed in its Phase I report. Transco's Phase I report confirmed that the pre-revolutionary era homestead would not be directly affected by the Project because the closest property corner is approximately 100 feet south of the centerline and there are no structures dating from the 18th century present. Additionally, review of the Stanton Rural Historic District resulted in no extant buildings, landscape features, or historic view sheds affected by the Skillman Loop.

Pennsylvania

Transco completed a Phase I cultural resources identification survey of approximately 574.8 acres along the Franklin and Dorrance Loops, including 3 contractor/pipe storage yards, 8 contractor staging areas, 15 access roads, and ATWS. Four archaeological resources, including two stone stacked piles and two dry laid stone walls, were identified on the Franklin Loop. The two stone stacked piles (sites F8-1 and F8a-1) are located beyond the current limits of disturbance and, therefore, Transco did not assess the sites' eligibility for the NRHP. The dry laid stone walls were assessed as having no further research potential and no further work was recommended.

A total of 22 archaeological resources were identified on the Dorrance Loop. These include one historic farmstead (site 36LU0097) and 21 dry laid stone walls. Site 36LU0097 is a grouping of foundation remnants, identified by local oral tradition as a late 19th century farmstead that may also include two human burials. All 21 stone wall remnants were assessed as having no further research potential and no further work was recommended. The historic foundations at site 36LU0097 were recommended as not eligible for the NRHP. However, Transco recommended that the two possible human graves at site 36LU0097 be avoided by construction activities, or that archaeological testing be conducted to ascertain their status as burials. Transco would restrict the limits of disturbance to avoid the site and recommended that protective fencing be placed around the site area during construction. Table 2.6.1-2 lists the cultural resources sites identified within the APE in Pennsylvania.

Geomorphological field investigations in Pennsylvania included shovel testing and pedestrian surveys at five waterbody crossings, with the addition of bucket augers, at Lehigh River and Tobyhanna Creek. Transco did not identify any soil deposits in Pennsylvania with the potential for containing buried archaeological sites.

Transco provided a Phase I report (Gallagher et al., 2013) to the FERC and Pennsylvania SHPO. In a letter dated November 8, 2013, the Pennsylvania SHPO concurred with the recommendations in the report regarding archaeological resources. We concur also.

Transco's aboveground reconnaissance survey identified three newly identified structures and one previously recorded aboveground structure along the Franklin Loop, which included 20th century residences and farm outbuildings (see table 2.6.1-2). Six aboveground resources more than 50 years of age were recorded along the Dorrance Loop, which include 20th century residences, farm outbuildings, and a saw mill. Two previously recorded stone bridges were also inventoried. All of the inventoried aboveground resources were recommended not eligible for the NRHP.

The aboveground reconnaissance survey results were submitted to the FERC and the Pennsylvania SHPO as part of the Phase I report. In a letter dated November 4, 2013, the SHPO concurred with the recommendations in the report regarding aboveground resources. We concur also.

Transco submitted an addendum report to the FERC and the Pennsylvania SHPO that included survey results for approximately 47.3 acres composed of corridor survey, a staging area, a pipe yard, and a compressor station for the Franklin and Dorrance Loops. One dilapidated stone wall was identified and assessed as having no further research potential, and no further work was recommended. In a letter dated April 17, 2014, the SHPO concurred with the recommendations in the report. We concur also.

As discussed in section 2.2.4, Transco proposes to mitigate for Project impacts on wetlands in Pennsylvania by preserving and/or enhancing wetland habitat at an approximate 15-acre site in Lehigh County (see figure 2.2.4-1). Transco contacted the SHPO regarding the activities to be conducted at the wetland mitigation site. The SHPO response is pending.

TABLE 2.6.1-2

Cultural Resources Sites Identified in Pennsylvania

Site Type/Loop/Site Number or Name	Description	Recommendation/NRHP Status
ARCHAEOLOGICAL SITES		
Franklin Loop		
FSW5-1	Historic stone wall	Not eligible
FSW7-1	Historic stone wall	Not eligible
F8-1	Historic stacked stone pile	Not assessed; Avoided
F8A-1	Historic stacked stone pile	Not assessed; Avoided
FSW6a-1	Historic stacked stone pile	Not assessed; Avoided
Dorrance Loop		
36LU0097	Historic foundations and possible human graves	Not eligible, Avoid grave site
DSW4-1	Historic stone wall	No further work
DSW4-2	Historic stone wall	No further work
DSW4-3	Historic stone wall	No further work
DSW4-4	Historic stone wall	No further work
DSW4-5	Historic stone wall	No further work
DSW4-6	Historic stone wall	No further work
DSW4-7	Historic stone wall	No further work
DSW5-1	Historic stone wall	No further work
DSW5-2-a	Historic stone wall	No further work
DSW5-2-b	Historic stone wall	No further work
DSW5-3	Historic stone wall	No further work
DSW5-4	Historic stone wall	No further work
DSW5-5	Historic stone wall	No further work
DSW5-6	Historic stone wall	No further work
DSW5-7	Historic stone wall	No further work
DSW5-8	Historic stone wall	No further work
DSW5-9	Historic stone wall	No further work
DSW5-10	Historic stone wall	No further work
DSW6-1	Historic stone wall	No further work
DSW6-2	Historic stone wall	No further work
DSW6-3	Historic stone wall	No further work
HISTORIC ARCHITECTURAL SITES		
Franklin Loop		
206 Cartwright Rd, Tunkhannock	Residence	Not eligible
205 Burger Rd, Blakeslee	Residence, outbuildings	Not eligible
400 Buck Blvd, White Haven	Shed	Not eligible
Winter House/Middleton Site (038819) 120 Orchard Ln, Blakeslee	Residence	Not eligible
Dorrance Loop		
1725 Prospect Rd (Rusczyk Rd), Mountain Top	Residence, outbuildings, saw mill	Not eligible
2274 Saint Marys Rd, Mountain Top	Residence, outbuildings	Not eligible
8069 Blue Ridge Trl, Mountain Top	Residence	Not eligible
8075 Blue Ridge Trl, Mountain Top	Residence	Not eligible
8113 Blue Ridge Trl, Wapwallopen	Residence, barn	Not eligible
436 Ruckle Hill Rd, Wapwallopen	Residence, shed	Not eligible
Bridge	Stone Bridge	Not eligible
Bridge	Stone Bridge	Not eligible

2.6.2 Native American Consultation

We sent our NOI to the Absentee Shawnee Tribe of Oklahoma, Cayuga Nation, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Oneida Tribe of Indians of Wisconsin, Oneida Indian Nation, Onondaga Indian Nation, Saint Regis Mohawk Tribe, Seneca Nation of Indians, Seneca-Cayuga Tribe of Oklahoma, Shawnee Tribe, Stockbridge-Munsee Community of Wisconsin, Tonawanda Seneca Nation, and Tuscarora Nation. No responses have been received to date. On August 28, 2013, we sent follow-up letters to these same tribes. No responses to our letter have been received.

On June 24, 2013, Transco sent letters to the 15 tribes initially contacted by us, as well as the Cherokee Nation of New Jersey, Nanticoke Lenni-Lenape Indians of New Jersey, Powhatan Renape Nation, Ramapough Lunaape Nation, and Sand Hill Band of Indians, to introduce the proposed Project and request comments regarding the potential for the Project to affect resources of cultural or religious significance to tribe. No responses have been received to date.

2.6.3 Unanticipated Discoveries Plan

Transco filed Unanticipated Discoveries Plans for New Jersey, Pennsylvania, Maryland, North Carolina, and Virginia with us as part of its application, and provided copies to the respective SHPOs. The plans would be used in the event any unanticipated cultural resources or human remains are encountered during construction. The Pennsylvania and North Carolina SHPOs concurred with the plans for those states in letters dated June 27, 2013 and November 12, 2013, respectively. No comments on the plans have been received from the Virginia or Maryland SHPOs. The New Jersey SHPO requested revision to the New Jersey plan, and the FERC staff requested revisions to the plans. Revised plans were provided to the FERC and all SHPOs on December 11 and 12, 2013. We find the revised plans acceptable. No additional comments regarding the revised plans have been received from the SHPOs.

2.6.4 Compliance with the NHPA

Compliance with Section 106 of the NHPA has not been completed for the proposed Project. To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, **we recommend that**:

- **Transco should not begin construction of facilities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads <u>until</u>:**

  a. Transco files with the Secretary:

  i. Phase I cultural resources survey and architectural inventory reports for any previously unreported areas, including any wetland mitigation parcels, and the appropriate SHPO's comments on the reports;

  ii. the Revised Phase I report for New Jersey, and the SHPO's comments on the report;

iii. the Virginia SHPO's comments on facility modifications that were excluded from cultural resources surveys;

b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

c. the FERC staff reviews and the Director of OEP approves the cultural resources reports, and notifies Transco in writing that construction may proceed.

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION--DO NOT RELEASE."

2.7 AIR QUALITY

Air quality would be affected by construction and operation of the Project. Though air emissions would be generated during construction, most of the air emissions associated with the Project would result from the long-term operation of the compressor stations. We received several comments with concerns regarding fugitive dust emissions during construction and additional operating emissions in the Project area. This section of the EA addresses the construction and operating emissions from the Project, as well as projected impacts and compliance with regulatory requirements.

The Project includes approximately 29.8 miles of 42-inch-diameter pipeline looping, net addition of 71,900 hp at four existing compressor stations, and modification of various aboveground facilities. Construction of the Project's facilities would primarily impact areas of Mercer, Somerset, and Hunterdon Counties, New Jersey, and Monroe, Luzerne, Columbia, and Lycoming Counties, Pennsylvania. The Project would also include minor modifications at facilities in North Carolina, Virginia, and Maryland.

Project activities at Compressor Stations 515, 517, and 520 have the potential to affect air quality during operation. The remainder of the activities proposed by this Project would not affect air emission producing equipment. Permit modifications would not be required for work at existing Compressor Station 205 in New Jersey; Compressor Station 145 in North Carolina; Compressor Stations 165, 170, 175, 180, and 185 in Virginia; and Compressor Station 190 in Maryland.

2.7.1 Existing Air Quality

The primary components of the Project are in New Jersey and Pennsylvania. The Project area is characterized by rolling hills to flat areas with large developed urban areas in New Jersey to rolling hills and steep terrain in Pennsylvania, which can result in wide variation in temperature, precipitation, and wind flow over short distances.

Ambient air quality is protected by federal and state regulations. The Clean Air Act, as amended in 1977 and 1990 (CAA), designates seven pollutants as "criteria pollutants" for which

National Ambient Air Quality Standards (NAAQS) are promulgated. The NAAQS for nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) were set to protect human health (primary standards) and public welfare (secondary standards).

Individual state air quality standards cannot be less stringent than the NAAQS. New Jersey and Pennsylvania have adopted the federal NAAQS through their respective state air quality regulations and have established state ambient air quality standards as outlined in table 2.7.1-1.

TABLE 2.7.1-1

National and State Ambient Air Quality Standards

Pollutant	Averaging Period	Primary NAAQS	Secondary NAAQS	Primary New Jersey AAQS	Secondary New Jersey AAQS	Pennsylvania AAQS
SO_2	1-hour[a]	75 ppb	None	Federal	Federal	Federal
	3-hour	None	0.5 ppm	None	0.5 ppm[b]	None
	24-hour	None	None	0.14 ppm[b]	0.1 ppm[b]	0.14 ppm
	Annual	None	None	0.03 ppm[b]	0.02 ppm[b]	0.03 ppm
CO	1-hour	35 ppm	None	Federal	None	Federal
	8-hour	9 ppm	None	Federal	None	Federal
NO_2	1-hour[c]	100 ppb	100 ppb	Federal	Federal	0.1 ppm
	Annual	53 ppb	53 ppb	50 ppb	Federal	Federal
O_3	1-hour	[d]	[d]	0.12 ppm[d,e]	0.08 ppm	None
	8-hour[f]	0.075 ppm	0.075 ppm	None	None	Federal
PM_{10}	24-hour	150 $\mu g/m^3$	150 $\mu g/m^3$	Federal	Federal	Federal
$PM_{2.5}$	24-hour	35 $\mu g/m^3$	35 $\mu g/m^3$	Federal	Federal	Federal
	Annual	15 $\mu g/m^3$	15 $\mu g/m^3$	Federal	Federal	Federal
Pb	Rolling 3-month	0.15 $\mu g/m^3$	0.15 $\mu g/m^3$	Federal[g]	None	Federal
Total Suspended Particulates	24-hour	None	None	260 $\mu g/m^3$	150 $\mu g/m^3$	None
	12 Consecutive Months	None	None	75 $\mu g/m^3$	60 $\mu g/m^3$	None

[a] Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

[b] Values are approximate based on conversions for units of measure.

[c] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb.

[d] EPA revoked the 1-hour O_3 standard in all areas effective June 15, 2005, although some areas have continuing obligations under that standard ("anti-backsliding"). The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

[e] The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

[f] Average of 4th highest daily maximum over 3 years.

[g] The federal standard has not been officially adopted, but it is currently being applied to determine compliance status.

Sources: EPA, 2013a; NJDEP, 2013b; PADEP, 2013b.

ppb = parts per billion

ppm = parts per million

$\mu g/m^3$ = micrograms per cubic meter

The EPA, state, and local agencies have established a network of ambient air quality monitoring stations to measure and track the background concentrations of criteria pollutants across the United States. Data were obtained from representative air quality monitoring stations

to characterize the background air quality in the Project region. Air monitoring stations in or near Morris, Mercer, and Philadelphia Counties were used for the New Jersey portions of the Project; and monitoring stations in Centre, Luzerne, Lackawanna, Lycoming, and Northampton Counties were used for the Pennsylvania portion of the Project. Air quality monitoring stations in closest proximity to Compressor Stations 520, 517, and 515, and near the pipeline loop construction sites in New Jersey were used. The Pennsylvania monitoring stations used to estimate air quality in the Project area are located in or near urban areas, thus concentration data are representative of urban land use rather than the rural areas where Project activities would occur. This should generally result in a conservative (high) estimate of ambient concentrations in the Project area. A summary of the regional ambient air quality monitoring data for the Project area is presented in table 2.7.1-2.

TABLE 2.7.1-2

Ambient Air Quality Concentrations

		New Jersey			Pennsylvania		
Pollutant	Averaging Period	Monitor Location	Year	Value	Monitor Location	Year	Value
SO_2	1-hour[a]	Morris	2013	6 ppb	Luzerne	2013	7 ppb
	3-hour [c]	N/A	N/A	N/A	N/A	N/A	N/A
	24-hour[b]	Morris	2013	3 ppb	Luzerne	2013	4 ppb
	Annual	N/A	N/A	N/A	N/A	N/A	N/A
CO	1-hour[c]	Bucks Co, PA	2013	2.4 ppm	Lackawanna	2013	1.8 ppm
	8-hour[c]	Bucks Co, PA	2013	1.8 ppm	Lackawanna	2013	1.3 ppm
NO_2	1-hour[d]	Morris	2013	35 ppb	Tioga Lackawanna	2013 2013	11 ppb 40 ppb
	Annual	N/A	N/A	N/A	N/A	N/A	N/A
O_3	1-hour	N/A	N/A	N/A	N/A	N/A	N/A
	8-hour[e]	Mercer	2013	0.07 ppm	Tioga Lackawanna	2013 2013	0.066 ppm 0.066 ppm
PM_{10}	24-hour[c]	Philadelphia Co, PA	2013	36 $\mu g/m^3$	Lycoming Luzerne	2013 2013	22 $\mu g/m^3$ 45 $\mu g/m^3$
$PM_{2.5}$	24-hour[f]	Mercer	2013	24 $\mu g/m^3$	Northampton Centre	2013 2013	34 $\mu g/m^3$ 22 $\mu g/m^3$
	Annual	Mercer	2013	9.1 $\mu g/m^3$	Northampton Centre	2013 2013	9.1 $\mu g/m^3$ 10.9 $\mu g/m^3$

[a] 3-year average of the 99th percentile of the daily maximum 1-hour average.
[b] High 1st High value.
[c] High 2nd High value.
[d] 3-year average of the 98th percentile of the daily maximum 1-hour average.
[e] 4th highest daily maximum.
[f] 98th percentile value.

Source: EPA, 2014b.
N/A = Not Data Available
ppb = parts per billion
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

Greenhouse gases (GHGs) occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. These gases are the integral components of the atmosphere's greenhouse effect that warms the earth's surface and moderates day/night temperature variation. In general, the most abundant GHGs are water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and O_3. On December 7, 2009, the EPA defined air pollution to include the mix of six long-lived and directly-emitted GHGs, finding that the presence of the following GHGs in the atmosphere may endanger public health and public welfare through climate change: CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

As with any fossil-fuel fired project or activity, the Project would contribute GHG emissions. The principle GHGs that would be produced by the Project are CO_2, CH_4, and N_2O. No fluorinated gases would be emitted by the Project. Emissions of GHGs are quantified and regulated in units of carbon dioxide equivalents (CO_2e). The CO_2e unit of measure takes into account the global warming potential (GWP) of each GHG. The GWP is a ratio relative to CO_2 that is based on the properties of the GHG's ability to absorb solar radiation as well as the residence time within the atmosphere. Thus, CO_2 has a GWP of 1, CH_4 has a GWP of 25, and N_2O has a GWP of 298. To obtain the CO_2e quantity, the mass of the particular chemical is multiplied by the corresponding GWP, the product of which is the CO_2e for that chemical. The CO_2e value for each of the GHG chemicals is summed to obtain the total CO_2e GHG emissions. We received comments on the amount of GHG emissions the Project would contribute. In compliance with EPA's definition of air pollution to include GHGs, we have provided estimates of GHG emissions for construction and operation, as discussed throughout this section. Impacts from GHG emissions (climate change) are discussed in more detail in section 2.7.2.

Air quality control regions (AQCRs) are areas established for air quality planning purposes in which implementation plans describe how ambient air quality standards would be achieved and maintained. AQCRs were established by the EPA and local agencies, in accordance with section 107 of the CAA, as a means to implement the CAA and comply with the NAAQS through State Implementation Plans (SIPs). The AQCRs are intra- and interstate regions such as large metropolitan areas where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or portion thereof, is designated based on compliance with the NAAQS. AQCR designations fall under three main categories as follows: "attainment" (areas in compliance with the NAAQS); "nonattainment" (areas not in compliance with the NAAQS); or "unclassifiable." Unclassifiable areas are treated as attainment areas for the purpose of permitting a stationary source of pollution. Areas that have been designated nonattainment but have since demonstrated compliance with the ambient air quality standard(s) are designated maintenance for that pollutant. Maintenance areas may be subject to more stringent regulatory requirements to ensure continued attainment of the NAAQS pollutant. The Project area spans several counties in New Jersey, Pennsylvania, North Carolina, Virginia, and Maryland that have varying attainment designations. Table 2.7.1-3 shows the counties traversed by the Project and the air quality designation for criteria pollutants.

The entire Project is also located within the Northeast Ozone Transport Region, which includes 11 northeastern states in which ozone transports from one or more states and contributes to a violation of the ozone NAAQS in one or more downwind states. States in this region are required to submit a SIP, stationary sources are subject to more stringent permitting

requirements, and various regulatory thresholds are lower for the pollutants that form ozone, even if they meet the O_3 NAAQS.

TABLE 2.7.1-3

Attainment Status for the Counties Affected by the Project

Location (County, State)	Air Quality Control Region [a]	Attainment or Unclassifiable	Nonattainment
Mercer, NJ	Metropolitan Philadelphia Interstate (81.15)	NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), CO (maintenance), $PM_{2.5}$
Somerset, NJ	New Jersey – New York – Connecticut Interstate (81.13)	NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), CO (maintenance), $PM_{2.5}$
Hunterdon, NJ	Northeast Pennsylvania-Upper Delaware Valley Interstate (81.55)	CO, NO_2, Pb, PM_{10}, $PM_{2.5}$, SO_2	O_3 (moderate)
Monroe, PA	Northeast Pennsylvania-Upper Delaware Valley Interstate (81.55)	CO, NO_2, Pb, PM_{10}, $PM_{2.5}$, SO_2	O_3 (maintenance)
Luzerne, PA	Northeast Pennsylvania-Upper Delaware Valley Interstate (81.55)	CO, NO_2, Pb, PM_{10}, $PM_{2.5}$, SO_2	O_3 (maintenance)
Columbia, PA	Central Pennsylvania Intrastate (81.104)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Lycoming, PA	Central Pennsylvania Intrastate (81.104)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Cleveland, NC	Eastern Mountain Intrastate (81.147)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Pittsylvania, VA	Central Virginia Intrastate (81.143)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Campbell, VA	Central Virginia Intrastate (81.143)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Appomattox, VA	Central Virginia Intrastate (81.143)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Buckingham, VA	Central Virginia Intrastate (81.143)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Fluvanna, VA	Northeastern Virginia Intrastate (81.144)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Louisa, VA	Northeastern Virginia Intrastate (81.144)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Culpepper, VA	Northeastern Virginia Intrastate (81.144)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Orange, VA	Northeastern Virginia Intrastate (81.144)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Fauquier, VA	Northeastern Virginia Intrastate (81.144)	CO, NO_2, O_3, Pb, PM_{10}, $PM_{2.5}$, SO_2	none
Prince William, VA	National Capital Interstate (81.12)	CO, NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), $PM_{2.5}$
Fairfax, VA	National Capital Interstate (81.12)	CO, NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), $PM_{2.5}$
Montgomery, MD	National Capital Interstate (81.12)	NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), CO (maintenance), $PM_{2.5}$
Howard, MD	Metropolitan Baltimore Intrastate (81.28)	CO, NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), $PM_{2.5}$
Baltimore, MD	Metropolitan Baltimore Intrastate (81.28)	CO, NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), $PM_{2.5}$
Harford, MD	Metropolitan Baltimore Intrastate (81.28)	CO, NO_2, Pb, PM_{10}, SO_2	O_3 (moderate), $PM_{2.5}$

[a] Though not a designated Air Quality Control Region, all counties listed above affected by the Project are located in the Northeast Ozone Transport Region.

Sources: EPA, 2013b

2.7.2 Regulatory Requirements

The CAA is the basic federal statute governing air pollution. The provisions of the CAA that are potentially relevant to the Project include the following (which are discussed below):

- Prevention of Significant Deterioration (PSD);
- Nonattainment New Source Review (NNSR);
- Title V Operating Permits;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP);
- General Conformity;
- GHG Reporting Rule; and
- State Regulations.

Prevention of Significant Deterioration

Proposed new or modified air pollutant emissions sources must undergo a New Source Review (NSR) permitting process prior to construction or operation. Through the NSR permitting process, local, state, and federal regulatory agencies review and approve project construction plans, regulated pollutant increases or changes, emissions controls, and various other details. The agencies then issue construction permits that include specific requirements for emissions control equipment and operating limits. Once construction is complete, the sources are issued operating permits that specify detailed operating conditions, emissions limits, fees, reporting and recordkeeping requirements, and various other operating parameters that must be met throughout the life of the permit. The three basic categories of NSR permitting are PSD, NNSR, and Minor Source NSR. Separate procedures have been established for federal pre-construction air permit review of certain large proposed projects in attainment areas versus nonattainment areas. Federal preconstruction review for affected sources located in attainment areas is called PSD. This process is intended to keep new or modified major air emission sources from causing existing air quality to deteriorate beyond acceptable levels. Federal preconstruction review for affected sources located in nonattainment areas is commonly referred to as NNSR, which contains more stringent thresholds and requirements. Projects for which pollutants are not subject to PSD or NNSR may be subject to minor source NSR, which is the minor source permitting process for the state or local jurisdictional agency. Minor source NSR ensures compliance with the state regulations discussed later in this section.

The PSD regulations (40 CFR 52.21) define a major source as any source type belonging to a list of named source categories that emit or have the potential to emit 100 tons per year (tpy) or more of any regulated pollutant or 250 tpy for sources not among the listed source categories. These are referred to as the PSD major source thresholds. The existing Compressor Stations

515, 517, and 520 have the potential to emit greater than the major source thresholds for at least one regulated pollutant. Therefore, they are existing major sources under the PSD regulations and modifications to these facilities are subject to the PSD regulations if the project emissions increase and net emission increase are greater than the significant emission rates (SERs) (100 tpy for CO; 40 tpy for nitrogen oxides (NO_x), volatile organic compounds (VOCs), and SO_2 [each]; 15 tpy for PM_{10}; 10 tpy for $PM_{2.5}$; 7 tpy for sulfuric acid mist; and 0.6 tpy for Pb).

As shown in tables 2.7.3-4 and 2.7.3-5, the proposed Project emissions increases and net emission increases at Compressor Stations 515, 517, and 520 would not exceed applicable major modification thresholds and would not be subject to PSD permitting for CO, NO_x, SO_2, VOC, PM_{10}, or $PM_{2.5}$. Other pollutants such as fluorides, sulfuric acid mist, total reduced sulfur, and lead emissions are negligible for these facilities due to the nature of the emission generating activities (natural gas combustion).

On May 13, 2010, the EPA tailored the applicability criteria for stationary sources and modification projects, resulting in the PSD GHG Tailoring Rule. However, on June 23, 2014, the Supreme Court ruled that the EPA cannot require PSD permitting based solely on GHG emissions, striking down a portion of the rule. Although the net GHG emissions increase at Compressor Stations 517 and 520 would be greater than the major modification threshold for each facility and would have been subject to PSD permitting, because of the Supreme Court ruling, PSD review is not applicable for these facilities solely based on GHG emissions. The net GHG increase at Compressor Station 515 would be less than 75,000 tpy; therefore, it would not have been subject to PSD review solely based on GHG emissions.

The potential impact on protected Class I areas must also be considered in the PSD review process. Areas of the country are categorized as Class I, Class II, or Class III, where Class I areas are designated specifically as pristine natural areas or areas of natural significance, including wilderness areas and national parks, and are afforded special protection under the CAA. Stationary sources within 100 kilometers of a Class I area requires a modeling analysis to ensure pristine air quality is maintained. The Federal Land Managers' Air Quality Related Values Work Group (2010) guidance states that a ratio of visibility-affecting emissions to distance (Q/d) value of 10 or less indicates that Air Quality Related Values analyses should not be required. Visibility-affecting pollutants are defined by the Federal Land Managers as: SO_2, NO_2, PM_{10}, and sulfuric acid mist.

Five Class I areas were identified in the states affected by the proposed project (see table 2.7.2-1). The closest Class I area to a new or modified compressor station is the Brigantine National Wildlife Refuge, located approximately 208 kilometers (129 miles) to the southeast of Compressor Station 515.

TABLE 2.7.2-1

Distance (km) and Direction to Federal Class I areas

Class I Area	Compressor Station 515	Compressor Station 517	Compressor Station 520
Shenandoah NP (VA)	330, SW	305, SW	275, S
Dolly Sods (WV)	385, SW	345, SW	300, SW
Otter Creek (WV)	400, SW	365, SW	318, SW
Lye Brook (VT)	300, NE	340, NE	395, NE
Brigantine (NJ)	208, SE	255, SE	305, SE

Based on these distances, the Q/d for Brigantine National Wildlife Refuge from the cumulative net emissions increases at Compressor Stations 515, 517, and 520 is only 1.5. This is well below the screening criteria of 10. In addition, the compressor stations are located over 100 kilometers from the nearest Class I area, therefore, no additional analysis of Class I area impacts was required.

Nonattainment New Source Review

In nonattainment areas, a separate procedure has been established for federal pre-construction air permit review of certain large proposed projects, known as NNSR. NNSR applicability is determined separately and independently from PSD review. The applicability of the NNSR permitting program is based on the major source status of the facility and emissions increase from the Project. A physical modification or a change in the method of operation of an existing major source is subject to NNSR if the alteration would result in a significant emission increase of affected pollutants. Each NNSR pollutant and its precursor(s) are reviewed individually and compared to the applicable major source thresholds to determine major source status on a pollutant-by-pollutant basis.

The entire state of Pennsylvania is located in the Ozone Transport Region and is therefore considered a moderate O_3 nonattainment area (including precursors such as NO_x and VOC). In Pennsylvania, the NNSR requirements are triggered in one of two ways (referred to as Step 1 and Step 2). In Step 1, NNSR is triggered if the potential emissions of NO_x or VOC from the project exceed 40 tpy. In Step 2, NNSR is triggered if the net emission increase of NO_x or VOC from the project plus all emission increases and decreases from projects in the 10 preceding years exceed 40 tpy. If NNSR is triggered in Step 1, for each pollutant that is subject to NNSR permitting, the applicant must assess the following items in the NNSR permit application:

- Lowest Achievable Emission Rate;
- Alternatives Analysis; and
- Purchasing of Emission Offsets.

If the project triggers NNSR in Step 2, only the requirement to obtain emission offsets applies.

Transco provided detail NNSR applicability determinations in the air plan approval applications to the PADEP. Based on these analyses, NNSR was not triggered in Step 1 or 2 for Compressor Stations 515, 517, or 520. A detailed summary of potential emissions and contemporaneous emission increases for these compressor stations are provided in the Impact and Mitigation section, below.

Title V Operating Permit

Title V of the CAA requires states to establish an air operating permit program. The requirements of Title V are outlined in 40 CFR 70 and the permits required by these regulations are often referred to as Part 70 permits. If a facility's potential-to-emit is equal to or greater than the criteria pollutant or hazardous air pollutants (HAP) thresholds, the facility is considered a major source. The major source threshold level for an air emission source is 100 tpy for criteria

pollutants. The major source HAP thresholds for a source are 10 tpy of any single HAP or 25 tpy of all HAPs in aggregate.

The EPA also promulgated the Title V GHG Tailoring Rule, which established permitting thresholds for GHG emissions under the Title V program. Sources with an existing Title V permit or new sources obtaining a Title V permit for non-GHG pollutants are required to address GHGs. New sources and existing sources not previously subject to Title V that have a potential-to-emit equal to or greater than 100,000 tpy CO_2e would become subject to Title V requirements.

Compressor Stations 515, 517, and 520 are major sources and currently operate under existing Title V operating permits. In accordance with Pennsylvania rule Title 25 Part I Subpart C 127.12b, Transco would submit Title V amendment applications after the proposed modifications are complete and operation begins. However, operation may commence under air plan approvals issued by PADEP consistent with federal (PSD and NNSR) and state Minor Source NSR requirements.

New Source Performance Standards

The NSPS, codified in 40 CFR 60, require new, modified, or reconstructed sources to control emissions as specified in the applicable source category provisions. Any source that is subject to provisions under an NSPS subpart is also subject to the general monitoring, reporting, and record keeping provisions of NSPS Subpart A, except as noted in the applicable subpart. This section outlines the applicability of NSPS subparts for the Project facilities.

Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, applies to manufacturers and owner/operators of spark ignition internal combustion engines manufactured after the applicability date stated in the rule for the particular type and size engine. The proposed emergency generators at Compressor Stations 515, 517, and 520 would be subject to NSPS Subpart JJJJ. Proposed modifications at all other locations do not include addition of or modification to internal combustion engines. Subpart JJJJ limits non-emergency operation of emergency engines to 100 hours per year to allow for maintenance, readiness, and non-emergency activities. The new and modified natural gas-fired engines at Compressor Stations 515, 517, and 520 must meet the applicable emission limits and operational requirements, as well as record keeping and reporting requirements of this subpart.

Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, applies to stationary combustion turbines with a maximum heat input equal to or greater than 10 million British thermal units per hour (MMBtu/hr), which were constructed, modified, or reconstructed after February 18, 2005. NSPS Subpart KKKK regulates emissions of NO_x and SO_2. The proposed natural gas-fired turbines at Compressor Stations 515, 517, and 520 would be subject to NSPS Subpart KKKK. The new and modified turbines at Compressor Stations 515, 517, and 520 must meet the applicable emission limits and operational requirements, as well as record keeping and reporting requirements of this subpart.

National Emission Standards for Hazardous Air Pollutants

The NESHAPs, codified in 40 CFR 61 and 63, regulate the emissions of HAPs from existing and new sources.

Part 61 NESHAP regulations apply to the following eight compounds listed as HAPs prior to the CAA Amendments of 1990: asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chlorides. The emission sources included in the Project would not emit these pollutants; therefore, 40 CFR 61 NESHAP regulations would not apply.

The 1990 CAA Amendments established a list of 189 HAPs, resulting in the promulgation of 40 CFR 63 NESHAP (Part 63). Part 63, also known as the Maximum Achievable Control Technology standards, regulates HAP emissions specific source types located at major or area sources of HAPs. Compressor Stations 515, 517, and 520 are currently major sources for HAPs, because each station has the potential to emit HAPs above the major source thresholds of 10 tpy of any single HAP or 25 tpy of all HAPs in aggregate. These stations would remain major sources of HAPs after the Project. NESHAPs apply to sources in specifically regulated industrial source categories [CAA Section 112(d)] or on a case-by-case basis [Section 112(g)] for major sources not regulated as a specific industrial source type. Below is a detailed discussion of the NESHAP regulations that are potentially applicable to the compressor stations. In addition to the source type-specific regulations, any source that is subject to a subpart of 40 CFR 63 is also subject to the general provision of NESHAP Subpart A, unless otherwise noted in the applicable subpart.

NESHAP Subpart YYYY, NESHAP for Stationary Combustion Turbines, applies to turbines at majors HAP sources. Compressor Stations 515, 517, and 520 are subject to this subpart. However, on August 18, 2004, the D.C. Circuit Court issued a Stay of Implementation on 40 CFR 63, Subpart YYYY. The EPA is evaluating the possibility of delisting gas-fired turbines from the Rule. Currently, natural gas-fired turbines are only subject to the general permitting and notification requirements under 40 CFR 63, Subpart A. Thus, there are no pollutants regulated under the current Subpart YYYY. The proposed gas turbines at Compressor Stations 515 and 520 would be subject to the general permitting and notification requirements under 40 CFR 63, Subpart A.

NESHAP Subpart ZZZZ, NESHAP for reciprocating internal combustion engines, would apply to the proposed emergency generators at Compressor Stations 515, 517, and 520. Each compressor station is and would remain a major source for HAP; therefore, the major source requirements would apply. The emergency generators must meet the applicable major source emission limits, operational requirements, and record keeping and reporting requirements of this subpart.

General Conformity

The General Conformity Rule is codified in 40 CFR 93, Subpart B, Determining Conformity of General Federal Actions of State and Federal Implementation Plans. The lead agency for any project that requires federal action must evaluate the applicability of the General Conformity Rule for emission-generating activities generated in nonattainment or maintenance areas. Consistent with the rule, the following terms are used in this document:

- *General Conformity applicability analysis* is the calculating and compiling of emissions data for comparison to the General Conformity applicability thresholds.

- *General Conformity Determination* is the evaluation (made after a General Conformity applicability analysis is completed) that a federal action conforms to the applicable SIP and meets the requirements of this subpart.

A General Conformity Determination must be completed by the lead federal agency if a federal action is likely to result in direct and indirect emissions (construction and operation) that would exceed the General Conformity applicability threshold levels of the pollutant(s) for which an air basin is in nonattainment or maintenance. According to the General Conformity regulations, the portion of an action that includes major or minor new or modified emissions from sources that are subject to NNSR or PSD permitting programs are exempt and are deemed to have conformed. This exemption applies to Compressor Station 515, located in Luzerne County, PA which is maintenance for ozone.

Section 176(c)(1) of the CAA (40 CFR 51.853) states that a federal agency cannot approve or support any activity that does not conform to an approved SIP. Conforming activities or actions should not, through additional air pollutant emissions:

- Cause or contribute to new violations of the NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or interim emission reductions.

A General Conformity applicability analysis is required for parts of the Project occurring in nonattainment or maintenance areas for criteria pollutants. We reviewed Transco's estimated construction emissions of criteria pollutants in each maintenance and nonattainment area for comparison to the General Conformity thresholds in 40 CFR 93.153(b)(1). The results are summarized in table 2.7.2-2.

As shown in table 2.7.2-2, the estimated applicable Project emissions in each nonattainment/maintenance area would be below the applicable General Conformity thresholds; therefore, a General Conformity Determination is not required.

GHG Reporting Rule

On September 22, 2009, the EPA issued the Mandatory Reporting of GHG Rule. This rule established the following reporting categories that may apply to the Project: general stationary fuel combustion sources (Subpart C), petroleum and natural gas systems (Subpart W), and suppliers of natural gas (Subpart NN). The Rule requires the source to report under Subpart C if it emits greater than or equal to 25,000 metric tons of GHG (as CO_2e) and has combined combustion equipment heat input rating at a location exceeds 30 MMBtu/hr. Under Subpart W, reporting is required if it emits 25,000 metric tons CO_2e or more per year.

TABLE 2.7.2-2

General Conformity Applicability Review

		Emissions (tpy)			
		O_3		$PM_{2.5}$	
County/State	Attainment Designation	VOC	NO_x	$PM_{2.5}$	SO_2
PA-NJ-MD-DE 8-hr O_3 Nonattainment area					
Mercer, NJ	NA for 1997 and 2008 8-hr O_3 and $PM_{2.5}$	1.6	14.2	1.4	0.5
Total, tpy		1.6	14.2	1.4	0.5
General Conformity Applicability Threshold, tpy		50	100	100	100
NY-NJ-CT O_3 and PM2.5 Nonattainment Area					
Somerset, NJ	NA for 1997 8-hr O_3 and $PM_{2.5}$	2.9	23.7	2.7	0.8
Hunterdon, NJ	NA for 1997 8-hr O_3	2.0	16.6	ATT	ATT
Total, tpy		4.9	40.3	2.7	0.8
General Conformity Applicability Threshold, tpy		50	100	100	100
Scranton-Wilkes Barre					
Monroe, PA	Maint for 1997 8-hr O_3	2.6	22.5	ATT	ATT
Luzerne, PA	Maint for 1997 8-hr O_3	3.1	25.3	ATT	ATT
Total, tpy		5.7	47.8	N/A	N/A
General Conformity Applicability Threshold, tpy		50	100	100	100
Washington DC-MD-VA					
Prince William, VA	NA for 1997 and 2008 8-hr O_3	0.4	3.5	ATT	ATT
Fairfax, VA	NA for 1997 and 2008 8-hr O_3	1.0	8.1	ATT	ATT
Montgomery, MD	NA for 1997 and 2008 8-hr O_3	0.7	5.8	ATT	ATT
Total, tpy		2.1	17.4	N/A	N/A
General Conformity Applicability Threshold, tpy		50	100	100	100
Baltimore MD					
Howard, MD	NA for 1997 and 2008 8-hr O_3	0.1	1.2	ATT	ATT
Baltimore, MD	NA for 1997 and 2008 8-hr O_3	0.6	4.6	ATT	ATT
Harford, MD	NA for 1997 and 2008 8-hr O_3	0.3	2.4	ATT	ATT
Total, tpy		1.0	8.2	N/A	N/A
General Conformity Applicability Threshold, tpy		50	100	100	100

The primary GHGs emitted from the Project would be CO_2, CH_4, and N_2O produced by combustion processes and released as fugitive from equipment leaks. Transco calculated expected emissions of GHG pollutants associated with the construction and operation of the Project, including all direct and indirect emission sources. In addition, GHG emissions were converted to total CO_2e emissions based on the GWP of each pollutant. Summaries of the potential GHG emissions from construction and operation of the Project are provided in tables 2.7.3-2 and 2.7.3-5, respectively.

The combustion-related GHG emissions from operation of Compressor Stations 515, 517, and 520 could exceed 25,000 metric tpy. If actual GHG emissions from these stations do exceed 25,000 metric tpy, Transco would be required to comply with all applicable requirements of the Mandatory Reporting Rule.

State Regulations

In addition to federal regulations, New Jersey and Pennsylvania have their own regulations that Transco would need to comply with during construction and operation of the Project.

Air pollution control regulations are promulgated in NJAC Title 7, Chapter 27. New Jersey state regulations for permanent emission sources are not applicable for this project because no permanent emissions sources are proposed in New Jersey. Subchapters 14 and 15 of this chapter limit idling of on-road vehicles and non-road construction equipment to no more than 3 minutes. Transco would be required to meet these idling regulations during construction of the Project in New Jersey.

Air pollution control regulations are promulgated in Pennsylvania Administrative Code Title 25, Chapters 121 through 145. These state regulations are applicable to the modification, construction, and operation of Compressor Stations 515, 517, and 520. Federal programs that are incorporated into Pennsylvania's code are limits on odor emissions, limits on visible emissions, NESHAP, and NSR. Pennsylvania has full delegation from the EPA for air permitting programs. Air permits are required prior to initiating modifications or adding to the emission sources at existing facilities and are based on Plan Approval applications. Transco filed its Plan Approval applications in May and June 2013 for the modifications at Compressor Stations 515, 517, and 520. These applications request that each modification be permitted to operate 8,760 hours per year, except for emergency generators. Potential emissions from the emergency generators are based on 500 hours per year of operation. The generators would be limited to 100 hours per year for maintenance, readiness, and non-emergency activities under NSPS Subpart JJJJ.

Pennsylvania has Best Available Technology requirements that apply to turbines rated greater than or equal to 15,000 brake hp. To comply with Best Available Technology requirements, Transco would use Solar's SoLoNOx® technology for NO_x control and oxidation catalyst for CO, VOC, and formaldehyde control on each new turbine at these stations. No other significant emission units would be installed in Pennsylvania as part of this Project.

2.7.3 Impacts and Mitigation

Construction Emissions

Emissions associated with construction of the Project would generally include: 1) exhaust emissions from construction equipment; 2) fugitive dust emissions associated with construction vehicle movement; and 3) fugitive dust associated with trenching, backfilling, and other earth-moving activities. The exhaust emissions would depend on the equipment used and the hours of operation.

Large earth-moving equipment, trucks, and other mobile sources may be powered by diesel or gasoline and are sources of combustion emissions, including NO_x, CO, VOC, PM_{10}, SO_2, and small amounts of HAPs. Emission standards for non-road diesel engines are promulgated in 40 CFR 89. Transco would ensure that all gasoline and diesel engines used during construction would be operated and maintained to comply with the EPA standards. Fuel

used in these engines would meet current EPA standards for sulfur content as outlined in 40 CFR 80 Subpart I. Exhaust emissions from construction equipment were calculated using the EPA's NONROAD Model, predicted equipment usage, and emission factors specific to each county affected by the proposed Project.

Air pollutants from construction equipment would be temporary and would generally be limited to the immediate vicinity of the construction area. Construction equipment would be operated on an as-needed basis during daylight hours. Proper maintenance of construction equipment and watering of the right-of-way will be done, as needed, to minimize dust emissions. Transco estimated the construction emissions associated with Project activities, shown in tables 2.7.3-1 and 2.7.3-2.

TABLE 2.7.3-1

Estimated Project-Related Construction Emission in 2015

	Emissions (tpy)				
Location (County, State)	VOC	NO_x	$PM_{10}/PM_{2.5}$	SO_2	CO
Mercer, NJ	1.6[b]	14.2[b]	3.5 / 1.4[b]	0.5[b]	18.4
Somerset, NJ	2.9[b]	23.7[b]	9.3 / 2.7[b]	0.8[b]	33.8
Hunterdon, NJ	2.0[b]	16.6[b]	6.8 / 1.9	0.6	23.7
Monroe, PA	2.6[a]	22.5[a]	12.0 / 2.9	0.77	30.5
Luzerne, PA	3.1[a]	25.3[a]	25.3 / 4.4	0.9	36.1
Columbia, PA	0.84	5.93	9.75 / 1.43	0.21	10.9
Lycoming, PA	0.84	5.93	13.3 / 1.83	0.21	10.9
Cleveland, NC	0.05	0.34	0.03 / 0.03	0.01	0.76
Pittsylvania, VA	0.3	2.4	0.2 / 0.2	0.2	4.8
Campbell, VA	0.4	3.5	0.3 / 0.3	0.1	6.1
Appomattox, VA	0.4	3.5	0.3 / 0.3	0.2	4.8
Buckingham, VA	0.1	1.2	0.1 / 0.1	0.1	2.0
Fluvanna, VA	0.4	3.5	0.3 / 0.3	0.2	4.8
Louisa, VA	0.4	3.5	0.3 / 0.3	0.1	6.1
Culpepper, VA	0.1	1.2	0.1 / 0.1	0.1	2.0
Orange, VA	0.1	1.2	0.1 / 0.1	0.1	0.7
Fauquier, VA	0.3	2.3	0.2 / 0.2	0.1	4.1
Prince William, VA	0.4[b]	3.5[b]	0.3 / 0.3	0.2	4.8
Fairfax, VA	1.0[b]	8.1[b]	0.7 / 0.7	0.3	14.2
Montgomery, MD	0.7[b]	5.8[b]	0.5 / 0.5	0.2	10.2
Howard, MD	0.3[b]	2.4[b]	0.2 / 0.2	0.1	2.7
Baltimore, MD	0.6[b]	4.6[b]	0.4 / 0.4	0.2	8.1
Harford, MD	0.1[b]	1.2[b]	0.1 / 0.1	0.1	2.0

[a] Area is classified as in maintenance.

[b] Area is classified as in nonattainment.

Note: Construction activities would begin in October 2014 and end in December 2015. To conservatively estimate emissions, all activity was assumed to occur in 2015.

TABLE 2.7.3-2

Greenhouse Gas Emissions from Facility Construction in 2015

	Potential Emissions, tpy			
Project Section	CH_4	N_2O	CO_2	Total (CO_2e)
Skillman Loop	< 0.1	<0.01	5,373	5,373
Pleasant Run Loop	< 0.1	<0.01	5,373	5,373
Franklin Loop	< 0.1	<0.01	9,382	9,382
Dorrance Loop	< 0.1	<0.01	3,968	3,968
Station 205	< 0.1	<0.01	1,263	1,263
Station 515	< 0.1	<0.01	1,637	1,637
Station 517	< 0.1	<0.01	1,431	1,431
Station 520	< 0.1	<0.01	1,431	1,431
Mainline valves/meter stations	< 0.1	<0.01	2,003	2,003
Total	<0.8	<0.08	31,861	31,861

Note: Construction activities will occur beginning in October 2014 and ending in December 2015. To conservatively estimate emissions, all activity was assumed to occur in 2015.

Transco's Fugitive Dust Control Plan describes mitigation measures that it would implement to control fugitive dust during construction, including: watering construction areas and reducing speed limits; covering open-body trucks; using existing public roads; and maintaining construction entrances at paved road access points. The plan also identifies individuals with implementation authority regarding fugitive dust mitigation. We have reviewed Transco's Fugitive Dust Control Plan and find it acceptable.

Once construction activities in an area are complete, fugitive dust and construction equipment emissions would subside. Emissions associated with the construction phase of the Project would be short-term in nature and would not result in a significant impact.

Operation Emissions

Project work at Compressor Stations 205, 145, and 165 through 190 is not expected to increase operational emissions. The 2,000 hp uprate at Compressor Station 205 would be performed on an electric motor and rewheeling activities do not affect turbines or other emissions sources. Condensate and oily water tanks at each site would produce negligible VOC emissions.

Operation of the Project's aboveground facility modifications at Compressor Stations 515, 517, and 520 would result in air emissions increases over existing emissions levels. Emission calculations have been submitted to PADEP through the Plan Approval Application. The potential to emit of the currently operating equipment and additional emissions resulting from the proposed Project actions are summarized in tables 2.7.3-3 and 2.7.3-4.

TABLE 2.7.3-3

Summary of Existing Equipment Potential to Emit

	Emissions (tpy)						
Source	NO_x	VOC	CO	SO_2	PM [a]	Total HAP	CO_2e [b]
Station 515	641	175	518	1	26	95	87,645
Station 517	229	15	53	2	4	4.3	68,193
Station 520	529	64	244	1	5	32	79,912

[a] Assumes PM = PM_{10} = $PM_{2.5}$

[b] GHG emissions are based on air plan approval applications that were completed prior to the EPA rule change for GHG reporting that affected the CH_4 and N_2O global warming potentials and CO_2 emission factor for natural gas combustion.

TABLE 2.7.3-4

Summary of Proposed Modifications (New Sources) Potential to Emit

	Emissions (tpy)						
Source	NO_x	VOC	CO	SO_2	$PM/PM_{10}/PM_{2.5}$ [a]	Total HAP	CO_2e [b]
Station 515	32.6	4.6	35.1	1.6	3.9	0.3	65,374
Station 517	84.6	10.6	59.6	4.3	10.2	1.0	163,757
Station 520	39.2	5.4	46.2	2.0	4.7	0.9	78,607
PSD SERs	40	40	100	40	25/15/10	NA	75,000
Station 515 Over SERs	N	N	N	N	N	NA	N
Station 517 Over SERs	Y	N	N	N	Y	NA	Y
Station 520 Over SERs	N	N	N	N	N	NA	Y

[a] Assumes PM = PM_{10} = $PM_{2.5}$

[b] GHG emissions are based on air plan approval applications that were completed prior to the EPA rule change for GHG reporting that affected the CH_4 and N_2O global warming potentials and CO_2 emission factor for natural gas combustion.

SERs = Significant Emission Rates

The emissions summaries above represent the potential emissions from the proposed Project (emissions increase for NNSR and PSD review applicability). NNSR may be triggered if either the project emissions increase *or* net emissions increase are significant. PSD review is triggered if the project emissions increase *and* the net emissions increase are significant. Therefore, the net emission increases were calculated for determining the applicability of NNSR and PSD for the proposed compressor station modifications. The net emission increases include any contemporaneous emission increases and decreases at the respective station. Table 2.7.3-5 shows the net emission increases for NO_x and VOC (NNSR – O_3 precursors) and each PSD pollutant with a Project emissions increase over the SERs.

In order to provide a thorough evaluation of the potential impacts on ambient air quality in the vicinity of the Project, Transco conducted a quantitative assessment of Project air emissions. The assessment included air dispersion modeling for the NO_2 and CO NAAQS using the AERMOD dispersion model in screening mode to provide a conservative evaluation of the potential impacts on the ambient air quality from operation of the Project activities at Compressor Stations 515, 517, and 520.

TABLE 2.7.3-5

Summary of Net Emission Increases from Proposed Modifications

Source	Emissions (tpy)			
	NO_x	VOC	$PM_{2.5}$	CO_2e
Station 515	32.6	34.8	NA	NA
Station 517	39.7	10.6	9.7	161,757
Station 520	39.2	5.4	NA	78,607
SERs	40	40	10	75,000
Station 515 NNSR/PSD Triggered	N	N	NA	NA
Station 517 NNSR/PSD Triggered	N	N	N	Y
Station 520 NNSR/PSD Triggered	N	N	NA	Y

[a] Assumes PM = PM_{10} = $PM_{2.5}$

SERs = Significant Emission Rates

In the screening mode, the AERMOD model is capable of only calculating the 1-hour average concentrations. As such, the 8-hour concentrations were calculated using the recommended (default) conversion factor of 0.9. The modeling included building downwash effects and receptors representative of station fencelines and the ambient air (beyond the fenceline) out to 8 kilometers (5 miles). For the NO_2 modeling, the O_3 limiting method was used with an in-stack NO_2 to NO_x ratio of 0.5, consistent with EPA guidance, and an O_3 background of 0.0725 parts per million. The potential impacts of the proposed modifications are summarized in table 2.7.3-6.

TABLE 2.7.3-6

Summary of Predicted Air Quality Impacts – Proposed Compressor Station Modifications [a]

Pollutant	Averaging Period	NAAQS (µg/m³)	SIL (µg/m³)	Station 515 Project Impact (µg/m³)	Station 517 Project Impact (µg/m³)	Station 520 Project Impact (µg/m³)
NO_2	1-Hour	188.7	7.5	121	181	110
CO	1-Hour	40,000	2,000	123	184	111
	8-Hour	10,000	500	111	166	100

[a] Concentrations represent the maximum modeled concentration.

SIL = significant impact level

µg/m³ = micrograms per cubic meter

The screening model demonstrates that the potential CO concentrations due to the compressor station modifications are below the significant impact level (SIL). The NO_2 concentrations modeled for each proposed compressor unit(s), however, are over the interim SIL established by EPA but below the 1-hour NO_2 NAAQS. In addition to being below the 1-hour NO_2 NAAQS, it should be noted that these concentrations represent the highest 1-hour concentration modeled for each proposed unit(s). However, the 1-hour NO_2 NAAQS represents the maximum allowable 98^{th} percentile of the maximum daily 1-hour NO_2 concentrations. AERSCREEN does not provide a similar statistical value for the modeled 1-hour NO_2 concentrations, thus the comparison of AERSCREEN results to the NAAQS is overly conservative.

Potential impacts on air quality associated with construction and operation of the Project would be minimized by strict adherence to all applicable federal and state regulations. Based on the analysis presented above, we believe that operation of the modified Compressor Stations 515, 517, and 520 would have no significant impact on regional air quality.

2.8 NOISE

Construction and operation of the Project may affect overall noise levels in the Project area. The ambient sound level of a region is defined by the total noise generated within the specific environment and is usually comprised of natural and man-made sounds. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of a day and throughout the week. This variation is caused in part by changing weather conditions and the effect of seasonal vegetation cover.

Two measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (L_{eq}) and the day-night sound level (L_{dn}). The L_{eq} is a sound level over a specific time period corresponding to the same sound energy as measured for an instantaneous sound level assuming it is a constant noise source. Sound levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, in the calculation of the L_{dn}, late night and early morning (10:00 p.m. to 7:00 a.m.) noise exposures are increased by 10 decibels to account for people's greater sensitivity to sound during nighttime hours. The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies.

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 decibels on the A-weighted scale (dBA) protects the public from indoor and outdoor activity interference. We have adopted this criterion. The Commission's regulations at 18 CFR 380.12(k)(4)(v)(A) require that noise attributable to any new compressor station or any modification, upgrade, or update to an existing compressor station not exceed an L_{dn} of 55 dBA at any pre-existing noise-sensitive areas (NSA) such as schools, hospitals, and residences. In addition, Commission regulations at 18 CFR 380.12(k)(4)(v)(B) requires that operation of compressor stations not result in any perceptible increase in vibration at any noise-sensitive area. Due to the 10 dBA nighttime penalty added prior to calculation of the L_{dn}, for a facility to meet the L_{dn} 55 dBA limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA. As a point of reference, a person's threshold of perception for a noticeable change in loudness is about 3 dBA, whereas a 5 dBA change is clearly noticeable and a 10 dBA change is perceived as either twice or half as loud.

The State of New Jersey's Noise Control Act of 1971 includes the promulgation of noise control standards for stationary commercial and industrial sources. NJAC 7:29 for Noise Control states that continuous noise between 7:00 a.m. and 10:00 p.m. must remain below 65 dBA at any residential property line, and continuous noise between 10:00 p.m. and 7:00 a.m. must remain below 50 dBA at any residential property line. At community service facilities, continuous noise

must remain below 65 dBA regardless of time of day. The FERC sound level requirement is more stringent than the State of New Jersey noise regulations for "residential-type" land use areas; therefore, the FERC sound level requirement is used throughout this section for determining whether noise levels are significant. No other state or local noise standards are applicable to the compressor stations.

Compressor Station 205 is located off Cold Soil Road in Mercer County, New Jersey. The area around the compressor station consists primarily of forest, farmland, and a few residences.

Compressor Station 515 is located along State Route 115 in Luzerne County, Pennsylvania. The nearby NSAs around the compressor station consist primarily of residences located along State Route 115. The area surrounding Compressor Station 517 in Columbia County, Pennsylvania is primarily forest land and some farmland. The nearby NSAs consist of a few residences located within 1 mile of the compressor station. Compressor Station 520 is located in Lycoming County, Pennsylvania. The land surrounding the compressor station is primarily rural with areas of forest and a few scattered residences. The nearby NSAs consist primarily of single-family residences.

2.8.1 Construction Noise Impacts and Mitigation

Noise could affect the local environment during the construction period along the pipeline loops and at aboveground facilities and contractor/pipe yards. The construction activities would be performed with standard heavy equipment, such as track-excavator, backhoe, bulldozer, dump trucks, loaders, cranes, and boring equipment; however, not all of the equipment would be used in each phase of construction.

Transco proposes two HDDs between MPs 1778.9 and 1780.0 of the Skillman Loop to avoid Beden Brook and its associated wetlands and tributaries, and to reduce impacts on nearby residences. Transco has committed to completing a noise assessment of the planned HDD prior to construction, which would identify the nearest NSAs and existing noise levels, and filing the final results with the FERC. In addition, to ensure that HDD-related noise does not exceed an L_{dn} of 55 dBA and/or increase noise over ambient conditions greater than 10 dBA, **we recommend that:**

- **Transco should file <u>in the construction status reports</u> the following information for each HDD entry and exit site:**

  a. noise measurements from the nearest NSA, obtained at the start of drilling operations;

  b. noise mitigation that Transco implemented at the start of drilling operations; and

  c. any additional mitigation measures that Transco will implement if the initial noise measurements exceeded an L_{dn} of 55 dBA at the nearest NSA and/or increased noise is 10 dB over ambient conditions.

Transco would construct the Project facilities during daytime hours. NSAs in close proximity at these locations would likely hear construction noise during this time, but the overall impact would be temporary. Nighttime noise associated with construction of the Project would remain unaffected. Blasting is not anticipated for construction of the Project. However, if required, blasting would be conducted during daylight hours and would not begin until occupants of nearby buildings, stores, residences, places of business, and farms have been notified, as described in Transco's Blasting Plan.

Construction activities at Compressor Stations 205, 515, 517, and 520 would consist of clearing and grading, earthwork, and installation of the new compressor units, piping, and associated buildings. Construction activities at Compressor Stations 205, 515, 517, and 520 would not be expected to cause any significant impact on the noise quality in the surrounding Project areas.

The most prevalent sound source during construction would be internal combustion engines used to power construction equipment. Due to the distance between the new equipment at each of the compressor stations and the closest NSAs, the noise impact and noise contribution of construction-related activities at the stations related to the installation of the new compressor units, gas after coolers, and motor upgrades are not expected to exceed the existing noise levels generated by the stations.

Transco committed to implement the following construction noise mitigation measures:

- employment of a "low-noise" generator (i.e., designed with a factory-installed acoustical enclosure) for the mud/cleaning system; and

- employment of an exhaust silencer on all engines associated with the stationary equipment. The exhaust silencer would be typical of a silencer employed on hospital generators and/or other stationary industrial engines in residential areas.

Construction activities associated with the Project would result in short-term, temporary increases in ambient noise levels. Based on Transco's commitment to limit construction to daytime hours and its proposed mitigation measures and our recommendation, we conclude that adjacent landowners would not be significantly affected by construction-related noise.

2.8.2 Operation Noise Impacts and Mitigation

Installation of additional horsepower or compressor modifications are proposed for Compressor Stations 205, 515, 517, and 520. As such, acoustic analyses have been completed for these stations. The permanent noise sources at all of the compressor stations would include (where applicable) turbine/engine exhaust, turbine/engine intake air system, turbine/engine/compressor casing, lube oil/auxiliary cooler, and aboveground station piping.

At Compressor Station 205, Transco proposes to uprate the two Siemens electric motors with gearboxes from 9,000 hp to 10,000 hp. Recent modifications at Compressor Station 205 also included the addition of 5,000 hp (FERC Docket CP13-132-000) and replacement of a motor (FERC Docket CP12-436-000).

Table 2.8.2-1 summarizes the current sound contribution of Compressor Station 205 and the estimated total compressor station sound level after installation of Project modifications.

TABLE 2.8.2-1

Noise Analysis for Compressor Station 205

Nearest NSAs	Distance & Direction of NSA to the Proposed Modifications	Current Sound Level (L_{dn}) of Existing Station	Estimated Total L_{dn} of Station after Installation of Modifications and Noise Mitigation Measures	Potential Noise Increase
NSA #1	1,300 feet (east)	51.3 dBA	51.6 dBA	0.3 dB
NSA #2	1,600 feet (north)	51.1 dBA	51.4 dBA	0.3 dB

The results of the acoustical analysis indicate that if the noise control recommendations and equipment sound specifications are successfully implemented, the noise attributable to the station at the nearby NSAs after the Project would be lower than 55 dBA L_{dn}. In addition, the installation of the proposed compressor station modifications are not expected to result in any perceptible increase in vibration at any nearby NSA.

At Compressor Station 517, Transco proposes to install a new turbine-driven compressor unit consisting of a Solar Model Titan 250S, with a 30,000 hp ISO rating, driving a centrifugal gas compressor. The turbine and compressor would be installed inside a separate acoustically insulated metal building to be located just east of Compressor Building A.

Table 2.8.2-2 summarizes the current sound contribution from Compressor Station 517, the estimated sound level attributable to the Project modifications, and the estimated total sound contribution of the compressor station after installation of Project modifications.

TABLE 2.8.2-2

Noise Analysis for Compressor Station 517

Nearest NSAs	Distance & Direction of NSA to the Compressor Addition	Current Sound Level (L_{dn}) of Station at Full Load	Estimated Sound Level (L_{dn}) of the Modifications	Estimated Total L_{dn} of Station after Installation of Modifications	Potential Noise Increase
NSA #1	1,990 feet (west)	44.1 dBA	43.0 dBA	46.6 dBA	2.5 dB

According to Transco, the existing sound level shown above is based on a March 2010 noise assessment for Compressor Station 517. The results of the acoustical analysis indicate that, if the noise control recommendations are successfully implemented, the total sound contribution of Compressor Station 517 at the nearby NSAs after installation of Project modifications would be equal to or lower than an L_{dn} of 55 dBA. In addition, the installation of the proposed compressor station modifications would not be expected to result in any perceptible increase in vibration at any nearby NSA.

To ensure that the actual noise levels resulting from operation of Compressor Station 205 and 517 are not significant, **we recommend that:**

- **Transco should file a noise survey with the Secretary no later than 60 days after placing the modified equipment at Compressor Stations 205 and 517 into service. If full load condition noise surveys are not possible, Transco**

should provide interim surveys at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at Compressor Stations 205 and 517 under interim or full horsepower load exceeds an L_{dn} of 55 dBA at the nearest NSA, Transco should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Transco should confirm compliance with the above requirement by filing a second noise survey for each station with the Secretary no later than 60 days after it installs the additional noise controls.

Compressor Station 515 is currently equipped with five engine-driven gas compressor units and two turbine-driven gas compressor units. This includes a 16,000-hp turbine driven unit installed as part of the Northeast Supply Link Project, which was placed into service in November 2013. The current compressor station power at full capacity is 48,000 hp. Transco proposes to install a Solar Model Mars 100S, with a 16,000 hp ISO rating, driving a centrifugal gas compressor. The turbine and compressor would be installed inside a separate acoustically insulated metal building to be located on the north side of the compressor station property.

The existing noise attributable to Compressor Station 515 at the nearby NSAs is greater than 55 dBA L_{dn}. Therefore, Transco proposes to implement the following noise mitigation measures at the compressor station:

- Installation of an additional silencer section to the existing vertical exhaust silencer for Units #1 – #5;
- Cover outside engine air intake piping (Units #1 – #5) with acoustical insulation; and
- Replace the Lube Oil cooler for Unit #6 with a lower-noise cooler.

Table 2.8.2-3 summarizes the current sound levels from Compressor Station 515 at nearby NSAs and the estimated total sound contribution of the compressor station after installation of modifications associated with the Project.

TABLE 2.8.2-3

Noise Analysis for Compressor Station 515

Nearest NSAs	Distance & Direction of NSA to the Compressor Addition	Current Sound Level (L_{dn}) of Station at Full Load	Estimated Sound Level (L_{dn}) of the Proposed Modifications	Estimated Total L_{dn} of Station after Installation of Modifications and Noise Mitigation Measures	Potential Noise Increase
NSA #1	1,900 feet (south)	57.7 dBA	41.9 dBA	55.9 dBA	-1.8 dB
NSA #2	1,400 feet (south-southwest)	61.5 dBA	44.8 dBA	59.6 dBA	-1.9 dB
NSA #3	1,350 feet (southwest)	61.4 dBA	45.4 dBA	59.1 dBA	-2.3 dB

The existing sound levels are based on a sound survey, completed by Transco's noise consultant Hoover & Keith, Inc., for the modifications at Compressor Station 515 from the previous Northeast Supply Link Project. The results of the acoustical analysis indicate if the

noise control recommendations and equipment sound specifications are successfully implemented, the noise attributable to the compressor station at the nearby NSAs after the installation of the station modifications associated with the Project would be lower than the current sound level of the station, which are greater than 55 dBA. In addition, the installation of the compressor station modifications would not be expected to result in any perceptible increase in vibration at any nearby NSA.

At Compressor Station 520, Transco proposes to install a Solar Model Titan 130S, with a 20,500 hp ISO rating, driving a centrifugal gas compressor. The turbine and compressor of the new Unit #8 would be installed inside a separate acoustically insulated metal building.

During the sound surveys with only Units #1 – #5, the total operating capacity of Units #1 – #5 was approximately 50 percent of the full capacity at the compressor station; therefore, 3 dB were added to the measured sound levels to represent the estimated sound level contribution of Units #1 – #5 at the nearby NSAs at full load/capacity. In addition, all of the compressor units were not operated simultaneously during the survey. Therefore, simultaneous operation of the existing units were estimated by adding the sound levels measured during operation of only Units #6/#7 and the estimated full load sound levels of only Units #1 – #5.

Table 2.8.2-4 summarizes the estimated sound level from Compressor Station 520 at the nearby NSAs.

TABLE 2.8.2-4

Summary of Estimated Sound Levels at Compressor Station 520 – Prior to Added Mitigation

Description of the Nearby NSA	Estimated Sound Level (L_{dn}) if Units #1 – #5 Operated at Full Load	Resulting Sound Level (L_{dn}) with Units #6 & #7 Operated at Full Load	Estimated Total Sound Level (L_{dn}) with All Units Operating
NSA #1: Residence 730 feet southwest of Compressor Building A	60.6 dBA	62.5 dBA	64.7 dBA
NSA #2: Residences 730 feet west of Compressor Building A	58.8 dBA	56.4 dBA	60.7 dBA
NSA #3: Residences 900 feet south of Compressor Building A	55.9 dBA	56.8 dBA	59.4 dBA
NSA #4: Residence 1,050 feet east of Compressor Building A	60.4 dBA	60.4 dBA	63.4 dBA

As shown in table 2.8.2-4, the noise level at the NSAs is greater than 55 dBA L_{dn}. As such, Transco has agreed to the following mitigation measures.

- Installation of an additional silencer section to the turbine exhaust system for Unites #6 and #7; and

- Cover any aboveground uninsulated gas piping components for Unit #6 and #7 with acoustical material.

Table 2.8.2-5 summarizes the current sound contribution of Compressor Station 520 with these additional noise mitigation measures.

TABLE 2.8.2-5

Noise Analysis for Compressor Station 520 – With Added Mitigation

Closest NSAs	Estimated Total Sound Level (L_{dn}) with All Units Operating – No Added Mitigation	Estimated Sound Level (L_{dn}) of Station with All Units Operating – with Added Mitigation	Estimated Sound Level (L_{dn}) Of the Modifications	Estimated "Total" L_{dn} of Station after Installation of Modifications with Noise Mitigation Measures	Potential Noise Increase
NSA #1	64.7 dBA	62.7 dBA	52.5 dBA	63.1 dBA	-1.6 dB
NSA #2	60.7 dBA	59.7 dBA	49.3 dBA	60.1 dBA	-0.6 dB
NSA #3	59.4 dBA	57.4 dBA	53.0 dBA	58.7 dBA	-0.7 dB
NSA #4	63.4 dBA	62.4 dBA	47.3 dBA	62.5 dBA	-0.9 dB

The results of the acoustical analysis indicate if the noise control recommendations and equipment sound specifications are successfully implemented, the noise attributable to Compressor Station 520 at the nearby NSAs after the installation of the compressor station modifications and associated mitigation measures should be lower than the current sound level attributable to the compressor station at the nearest NSAs which are greater than 55 dBA. In addition, the installation of the proposed compressor station modifications would not be expected to result in any perceptible increase in vibration at any nearby NSA.

To ensure that the actual noise levels resulting from operation of Compressor Stations 515 and 520 are not significant, **we recommend that:**

- **Transco should make all reasonable efforts to ensure its predicted noise levels from Compressor Stations 515 and 520 are not exceeded at nearby NSAs and file noise surveys showing this with the Secretary no later than 60 days after placing Compressor Stations 515 and 520 into service. If a full load condition noise survey is not possible, Transco should provide interim surveys at the maximum possible horsepower load and provide the full load surveys within 6 months. If the noise attributable to the operation of all of the equipment at Compressor Stations 515 and 520 under interim or full horsepower load conditions exceeds the existing noise levels at any nearby NSAs, Transco should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Transco should confirm compliance with the above requirement by filing a second noise survey for each station with the Secretary no later than 60 days after it installs the additional noise controls.**

Based on Transco's proposed station design and mitigation measures, the noise at each compressor station would either not exceed our noise criteria or would result in a reduction in noise at stations currently above an L_{dn} of 55 dBA at the nearest NSAs. Therefore, we conclude that there would not be a significant impact on noise in the Project areas during operation of the proposed facilities.

2.9 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for an accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiant, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. To increase safety and make the methane detectable by odor, Transco would add a chemical odorant that produces the familiar natural gas smell. The natural gas in Transco's proposed pipelines would contain a chemical odorant that produces a "natural gas smell."

Methane has an auto-ignition temperature of 1,000 °F and is flammable at concentrations between 5.0 percent and 15.0 percent in air. It is buoyant at atmospheric temperatures and disperses rapidly in air. An unconfined mixture of methane and air is not explosive; however, it may ignite if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode.

2.9.1 Safety Standards

The DOT is mandated to provide pipeline safety under 49 USC 601. The DOT's PHMSA administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. As discussed in section 1.4.3, PHMSA assisted in preparing this EA as a federal cooperating agency. PHMSA develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety.

PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. The DOT allows for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing, at a minimum, the federal standards. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement actions. For the proposed Project, PHMSA federal inspectors perform inspections on interstate natural gas pipeline facilities in New Jersey and Pennsylvania.

The DOT pipeline standards are published in 49 CFR 190-199. Part 192 specifically addresses the minimum federal safety standards for transportation of natural gas by pipeline.

Under a *Memorandum of Understanding on Natural Gas Transportation Facilities* dated January 15, 1993, between the DOT and the FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it would design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with DOT federal safety standards and plans for maintenance and inspection. Alternatively an applicant may certify that it has been granted a waiver of the

requirements of the safety standards by the DOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the memorandum to promptly alert the DOT. The memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

Transco has stated that the Project facilities would be designed, constructed, operated, and maintained in accordance with the DOT *Minimum Federal Safety Standards* in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The DOT specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

The DOT also defines area classifications, based on population density in the vicinity of pipeline facilities, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

Class 1 – location with 10 or fewer buildings intended for human occupancy.

Class 2 – location with more than 10 but less than 46 buildings intended for human occupancy.

Class 3 – location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period.

Class 4 – location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. For example, pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (i.e., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4 locations). Pipe wall thickness and pipeline design pressures; hydrostatic test pressures; MAOP; inspection and testing of welds; and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Class locations for the Project have been determined based on the relationship of the pipeline loop centerlines to other nearby structures and manmade features. Class locations along each pipeline loop include:

- Skillman Loop – 2.6 miles would be located in a Class 1 area; 1.0 mile would be located in a Class 2 area; and 2.7 miles would be located in a Class 3 area.

- Pleasant Run Loop – 1.9 miles would be located in a Class 1 area and 4.9 miles would be located in a Class 2 area.

- Franklin Loop – 8.2 miles would be located in a Class 1 area; 1.2 miles would be located in a Class 2 area; and 2.1 miles would be located in a Class 3 area.

- Dorrance Loop – 4.5 miles would be located in a Class 1 area and 0.7 mile would be located in a Class 2 area.

If a subsequent increase in population density adjacent to the right-of-way were to result in a change in classification for the pipeline, Transco would reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness, if required to comply with the DOT requirements for the new class location.

The DOT Pipeline Safety Regulations require operators to develop and follow a written Integrity Management Program that contains all the elements described in 49 CFR 192.911 and addresses the risks on each transmission pipeline segment. Specifically, the rule establishes an integrity management program which applies to all high-consequence areas (HCA).

The DOT has published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for the DOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method, an HCA includes:

- current Class 3 and 4 locations;

- any area in Class 1 or 2 where the potential impact radius[11] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle;[12] or

- any area in Class 1 or 2 where the potential impact circle includes an identified site.

An "identified site" is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

[11] The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in pounds per square inch (gauge) multiplied by the square of the pipeline diameter in inches.

[12] The potential impact circle is a circle of radius equal to the potential impact radius.

In the second method, an HCA includes any area within a potential impact circle which contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Once a pipeline operator has determined the HCAs along its pipeline, it must apply the elements of its integrity management program to those sections of the pipeline within HCAs. The DOT regulations specify the requirements for the integrity management plan in Subpart O of Part 192, Gas Transmission Pipeline Integrity Management. The HCAs for the Project have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. According to the first method described above, all Class 3 and Class 4 locations are HCAs. Table 2.9.1-1 identifies HCA locations, which were determined according to the second method.

We received comments noting that use of the second method of determining HCAs minimizes the extent of HCAs in the Princeton Ridge area along the Skillman Loop (MPs 1776.8 to 1778.1), and questioning the spacing of MLVs in the area. Transco identifies approximately 85 percent of the Princeton Ridge crossing as within Class 3, for which 49 CFR 192.179 specifies a maximum distance of 4 miles to the nearest MLV (i.e., a maximum distance of 8 miles between MLVs). The Skillman Loop would extend between existing MLVs at MP 1776.8 and 1783.0, a distance of 6.2 miles. Thus, the MLV spacing for the Skillman Loop would meet the requirements for a Class 3 area.

TABLE 2.9.1-1

High Consequence Areas Crossed by the Project [a]

State/Facility/Milepost Locations	Length (miles)
New Jersey	
Skillman Loop	
1776.8 – 1777.3	0.5
1779.1 – 1779.6	0.5
1781.5 – 1781.8	0.3
1782.0 – 1782.6	0.5
Pleasant Run Loop	
1.2 – 1.7	0.5
2.6 – 3.3	0.7
Pennsylvania	
Franklin Loop	
57.5 – 58.1	0.6
61.0 – 63.4	2.4
68.0 – 68.6	0.6
Dorrance Loop	
No HCAs	0

[a] The HCAs in this table were identified using the second method.

Other comments focused on the potential for construction of the loops to damage existing pipelines including in the Princeton Ridge area of the Skillman Loop; the safety of operating high pressure natural gas pipelines in residential areas and near schools; emergency response

plans and the ability of local responders to address and emergency situation; the adequacy of corrosion control measures and integrity management systems; Transco's historical safety record; potential public safety issues associated with construction personnel; and the level of outside (FERC or DOT) oversight to ensure safety. The comments not addressed in other sections of this document are addressed below.

As previously discussed and required by DOT PHMSA regulations, the pipeline loops and aboveground facilities would be designed, constructed, operated, and maintained to meet or exceed the requirements at 49 CFR 192. The general construction methods that Transco would implement to ensure the safety of the Project are described in section 1.6.1, including welding, inspection, and integrity testing procedures. Transco identified the following safety measures that would be implemented which exceed the requirements in 49 CFR 192:

- the pipe material would generally exceed the American Petroleum Institute-5L requirements;
- a 0.5 design factor would be used for all fabricated mainline valve assemblies;
- all girth welds would be 100 percent non-destructively tested regardless of pipeline classification;
- additional cover depth may be provided at certain locations (e.g., roads, streams or other waterbodies); and
- Transco would generally test new pipeline sections above the minimum required test pressure.

Regarding the potential for Project construction to damage existing pipeline facilities, section 1.6.1 describes the general measures that Transco would implement to protect existing facilities during construction and section 1.6.2 describes more specific construction procedures that would be implemented when working over existing pipelines or conducting crossovers. Sections 1.6.2 and 2.1 also describe the geophysical and geotechnical field studies that Transco undertook to evaluate the extent and nature of shallow, hard bedrock and subsurface boulders within the Princeton Ridge area of the Skillman Loop, and to characterize the physical parameters of soils within this area. The results of these studies are included in Transco's Rock Handling Plan, which also describes the measures that Transco would implement to remove bedrock and boulders without blasting, and other measures that would be implemented to protect the existing pipeline during construction and to test the integrity of the existing pipeline in conjunction with construction of the Skillman Loop.

The Rock Handling Plan specifically addresses concerns raised by Princeton Ridge stakeholders that construction over the existing pipeline could cause stress that would damage the pipeline. Transco contracted with Stress Engineering Services, Inc., a company that specializes in evaluating material stress including in the pipeline industry. Stress Engineering Services, Inc. utilized the site-specific geophysical and geotechnical information obtained by Transco, and other construction-related information from Transco, including the use of a mat bridge to create an air space between the ground surface above the existing pipeline and the

construction equipment that would travel and operate on the mat bridge. A combination of two-dimensional and three-dimensional finite element analysis models were used to evaluate the stresses in the existing pipeline under various construction scenarios, soil types, and geologic conditions. Of particular interest was the assessment of stress and damage that could occur if the bottom side of the pipeline was in contact with constrained rock (bedrock or a large boulder). The two-dimensional analysis was used to identify key variables, which were then used to construct the three-dimensional models. When the three-dimensional analysis was performed on measured properties, the maximum plastic strain in the pipe was 0.6 percent and the largest dent depth was 0.2 inch (0.5 percent), which are below the values permitted by American Society of Mechanical Engineers B31.8 for the minimum measured soil properties. Additional three-dimensional load cases were run to model more conservative conditions including the presence of softer soils than those measured in the field; equipment loads twice the maximum expected; the presence of a hard rock in contact with the bottom of the pipeline; and the position of the mat bridge footing directly over the pipeline. Under these combined, conservative assumptions, the maximum strain from the analysis is 4.6 percent, slightly exceeding the 4 percent limit permitted for girthwelds in American Society of Mechanical Engineers B31.8. By utilizing the expected equipment load (rather than two times the equipment load), the strain is reduced to 3.2 percent.

The Princeton Ridge Coalition raised concerns about the stress analysis conducted by Transco, particularly regarding the ability of saturated soils near the existing pipeline to safely support construction equipment, and questioned how the magnitude and distribution of construction loads and the presence of shallow bedrock and large boulders near the pipeline were determined and considered in the analysis. The Princeton Ridge Coalition concludes that Transco's proposed construction methods would violate 49 CFR 192 and result in an unacceptable impact on public safety.

We recognize the Princeton Ridge Coalition's concerns, but conclude that Transco's field studies and analysis adequately characterize the existing environment and the stresses that would result from construction of the Skillman Loop, but believe that further definition of the measures that Transco would implement in the event that highly saturated soil conditions are encountered is warranted. Therefore, **we recommend that:**

- **<u>Prior to construction of the Skillman Loop</u>, Transco should file with the Secretary for review and approval by the Director of OEP the specific measures that it will implement between MPs 1776.8 and 1778.1 to monitor and maintain the proposed air gap over the existing pipeline, including areas of highly saturated soil conditions.**

In conclusion, we find that construction of the Skillman Loop in the Princeton Ridge area as proposed by Transco in the Rock Handling Plan and other submittals, and implementation of our recommended condition above, would protect the integrity of the existing pipeline. Furthermore, Transco would confirm the integrity of the pipeline by conducting a pre-construction in-line inspection; hydrostatic testing prior to returning it to service; a second in-line inspection after the successful completion of hydrostatic testing; and through continued implementation of the Integrity Management Program described below and as required by PHMSA regulations.

The DOT prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Each pipeline operator is required to establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency system shutdown and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards.

The DOT also requires pipeline operators to place pipeline markers at frequent intervals along the pipeline rights-of-way, such as where a pipeline intersects a street, highway, railway or waterway, and at other prominent points along the route. Pipeline right-of-way markers can help prevent encroachment and excavation-related damage to pipelines. Because the pipeline right-of-way is much wider than the pipeline itself, and a pipeline can be located anywhere within the right-of-way, state laws require excavators to call their state One-Call center well in advance of digging to locate underground utilities and ensuring it is safe for the contractor to dig in that location.

In accordance with DOT regulations, the proposed facilities would be regularly inspected for leakage as part of scheduled operations and maintenance, including:

- physically walking and inspecting the pipeline corridor periodically;
- conducting fly-over inspections of the right-of-way as required, generally weekly;
- inspecting valves and maintaining compressor engines; and
- conducting leak surveys at least once every calendar year or as required by regulations.

During inspections, Transco employees would look for signs of unusual activity on the right-of-way and would immediately respond to assess the nature of the activity and remedy with prescribed corrective action.

In addition to the DOT-required surveys described above, Transco would monitor portions of its pipeline system using a supervisory control and data acquisition system. This system gathers information related to system pressures, flows, and customer deliveries 24 hours

per day, 365 days per year and transfers the information to the Gas Control Center located in Houston, Texas for the facilities to be installed.

The new pipeline would be connected to Transco's existing cathodic protection system to prevent corrosion. Transco personnel would check the voltage and amperage every 2 months as well as annual surveys of the pipe-to-soil potentials. In addition, in-line inspection tools would be used to ensure that the cathodic protection systems are working effectively. We received comments from the Princeton Ridge Coalition regarding the effect of large boulders on the cathodic protection system, particularly in the Princeton Ridge area. As noted above, Transco's monitoring of the performance of the cathodic protection would ensure that cathodic protection shielding that could occur does not adversely affect the pipeline integrity.

The DOT regulations require Transco to establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. Transco has developed a Public Awareness and Damage Prevention Program, which requires communication with emergency responders on an annual basis. The program is intended to assist with pipeline marker identification, understanding the pipeline right-of-way, emergency contact information, outlines the physical properties of natural gas, and communicates the expectations of emergency first responders during an emergency.

Transco maintains 24-hour emergency response capabilities, including an emergency-only phone number, which accepts collect charges. The number would be included in informational mail-outs, posted on all pipeline markers, and provided to local emergency agencies in the vicinity of the pipeline and compressor station.

In addition, Transco has developed emergency response plans that it uses for its entire system, and Transco's operating personnel attend training for emergency response procedures and plans. During construction of the pipeline loops, Transco would continue to implement the measures in its emergency response plans associated with the existing pipelines. Transco would review and revise its emergency response plans prior to placing the new facilities in operation. Transco would meet with Local Emergency Planning Committees, which include fire departments, police departments, and public officials, to review plans and would work with these committees to communicate the specifics about the pipeline facilities in the area and the need for emergency response. Transco would also meet periodically with the groups to review the plans and revise its plans when necessary. Local Emergency Planning Committee personnel would be involved in any operator-simulated emergency exercises and post-exercise critiques, if conducted. Transco would use all available, reasonable, and relevant means to support the pipeline and facilities if an emergency occurs.

The most effective and immediate way to begin to address a gas pipeline rupture is to shut off the gas source. Transco has valves spaced along the pipeline that can be used to shut off the gas and isolate each pipeline segment. In an emergency, Transco would rely on the local emergency services (e.g., fire and police) to communicate with the public. Transco follows the Incident Command protocol, developed by the Fire Marshall and implemented by local fire departments, and maintains contact with the emergency responders. In 2012, Transco

representatives conducted 162 face-to-face meetings with emergency officials for the purpose of emergency response education.

As part of its Public Awareness Program for its existing pipeline system, Transco provides residents who live along the pipeline right-of-way Transco's 24-hour emergency only number and information about the pipeline, including what activities to look for and what to do in an emergency. Transco works with local emergency response officials to educate them about the nature of pipeline operations and the appropriate actions to take if there is an accident. Transco would adopt the same program measures and communications for the proposed pipeline loops and new aboveground facilities.

As part of its Public Awareness Program, Transco annually mails emergency contact information and maps of its pipeline facilities to emergency officials located along its entire pipeline system, including all municipalities crossed by the Project. The mailing also includes a web address to an online pipeline emergency computer-based training module. In 2012, Transco mailed about 10,000 letters to emergency officials. Transco also sends information to all excavators in each county where it operates (about 280,000).

As previously discussed, Transco has developed an enhanced pipeline Integrity Management Program to improve pipeline safety along its entire pipeline system during operation. The program was developed and implemented to comply with the prescriptive based requirements of Subpart O, 49 CFR 192 and is routinely audited by PHMSA. Transco implements the program through:

- assessing the integrity of pipelines in HCAs and other areas;
- improving integrity management data systems within the company;
- increasing the integrity and reliability of the pipeline system;
- improving the government's role in reviewing the adequacy of integrity programs and plans; and
- providing increased public assurance of pipeline safety.

The new pipeline loops would be incorporated into the Integrity Management Program. The Integrity Management Program also includes specifications for conducting hydrostatic testing, both on newly installed pipelines and existing pipelines (in the case of uprates), and for conducting internal inspections by use of smart pigs and caliper pigs. The smart pigs use technologies such as Magnetic Flux Leakage and ultrasonics to detect the various aspects of the pipeline. As previously discussed, Transco has committed to running an in-line inspection tool prior to construction in order to assess the integrity of the existing pipeline along the Skillman Loop in the Princeton Ridge area. Transco would also evacuate the natural gas from the Princeton Ridge pipeline segment and replace it with water during excavation of rock utilizing the rock hammering technique. Following the rock hammering activities, Transco would hydrostatically test the existing pipeline before returning it to service, followed by another run of an in-line inspection tool.

We received comments from the Delaware Riverkeeper Network regarding the maximum velocity planned for the new pipeline. The commentor alleges that gas velocities on certain segments of Transco's system would exceed 50 feet per second, which could cause stresses to the pipeline that in turn would result in unsafe operating conditions. The commentor does not cite any industry or government standard, regulation, or study to support its position. Transco states that while it typically tries to limit velocities on its system to 60 feet per second, this is to prevent noise and vibration of mechanical equipment and for operational efficiency rather than for safety reasons. Based on steady state conditions, Transco estimated flow velocities would not exceed 60 feet per second. Under peak transient design conditions, only one section, between Compressor Stations 515 and 517, would reach 61 feet per second. Further, Transco stated that the flow velocity in the proposed loops would range from 30 to 50 feet per second. Finally, Transco, citing a study funded by and prepared on behalf of the Mineral Management Service and American Petroleum Institute, states that a flow velocity of 100 feet per second is a conservative (low) design guideline for protecting pipelines from metal loss due to droplets of condensate or water, neither of which are typically present in mainline transmission piping such as those that would be expanded under this Project (Svedeman and Arnold, 1994). Given Transco's explanation and supporting documentation, the anticipated velocities on Transco's system would not result in unsafe operating conditions. Further, PHMSA, which is responsible for the safety of interstate pipeline systems, does not specify a maximum velocity in its regulations.

We received comments from Stuart Country Day School of the Sacred Heart and nearby landowners regarding the safety of the Project area during construction, including children's safety. Transco has stated that they are currently consulting with the administrators of these schools to identify measures that will minimize disruption of daily school operations. Such measures may include scheduling of major construction activities when the school is not in session. Transco has also committed to ensuring that all of the employees on the right-of-way are in compliance with DOT regulations for current and previous drug and alcohol testing records for those that will perform safety sensitive functions.

We received comments from landowners about the need for safety inspections of the construction activities. Transco's contractors, including construction workers, would be required to adhere to federal and state safety regulations and recommendations. In addition, FERC staff or its contractors would routinely inspect construction activities to ensure environmental compliance.

2.9.2 Pipeline Accident Data

The DOT requires all operators of natural gas transmission pipelines to notify the National Response Center at the earliest practicable moment following the discovery of an incident and to submit a report within 30 days to PHMSA. Generally, gas pipeline incidents are defined as any release that results in one or more of the following consequences:

- a death or personal injury requiring hospitalization;
- property damage, excluding cost of gas lost, of more than $50,000, in 1984 dollars;[13] or
- unintentional estimated gas loss of three million cubic feet or more.

Incidents may also include events that are significant in the judgment of the operator, even though they did not meet the criteria above. During the 20-year period from 1994 through 2013, a total of 1,237 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 2.9.2-1 provides a distribution of the causal factors as well as the number of each incident by cause from 1994 to 2013.

TABLE 2.9.2-1

Natural Gas Transmission Pipeline Significant Incidents by Cause (1994-2013) [a]

Cause	Number of Incidents	Percentage
Corrosion [b]	292	23.6
Excavation	211	17.0
Pipeline material, weld, or equipment failure	304	24.6
Natural force damage	142	11.5
Outside Force [c]	74	6.0
Incorrect operation	33	2.7
All other causes [d]	181	14.6
Total	**1,237**	**-**

[a] All data gathered from PHMSA Serious Incident files, March 25, 2014 http://primis.phmsa.dot.gov/comm/reports/safety/
[b] Includes third-party damage.
[c] Fire, explosion, vehicle damage, previous damage, intentional damage.
[d] Miscellaneous causes or other unknown causes.

The dominant causes of pipeline incidents from 1994 to 2013 were corrosion and pipeline material, weld, or equipment failure, constituting 48.2 percent of all significant incidents. The pipelines included in the data set in table 2.9.2-1 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents because corrosion is a time-dependent process. The use of both an external protective coating and a cathodic protection system,[14] required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

[13] $50,000 in 1984 dollars is approximately $116,183 in 2013 (Bureau of Labor Statistics, 2014).

[14] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline that includes the use of an induced current and/or a sacrificial anode that corrodes preferentially.

Outside force, excavation, and natural forces were the cause in 31.5 percent of significant pipeline incidents from 1994 to 2013. These result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geological hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 2.9.2-2 provides a breakdown of outside force incidents by cause.

TABLE 2.9.2-2

Outside Forces Incidents by Cause [a] (1994-2013)

Cause	Number of Incidents	Percent of All Incidents
Third party excavation damage	176	14.2
Operator excavation damage	25	2.0
Unspecified excavation damage/previous damage	10	0.8
Heavy rain/floods	72	5.8
Earth movement	35	2.8
Lightning/temperature/high winds	21	1.7
Natural force (other)	14	1.1
Vehicle (not engaged with excavation)	45	3.6
Fire/explosion	8	0.6
Previous mechanical damage	5	0.4
Fishing or maritime activity	7	0.6
Intentional damage	1	0.1
Electrical arcing from other equipment/facility	1	0.1
Unspecified/other outside force	7	0.6
TOTAL	427	-

[a] Excavation, Outside Force, and Natural Force from table 2.9.2-1.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements. Comments were raised concerning the increased safety with the installation of a new pipeline near existing pipelines. Regardless of whether a pipeline shares the right-of-way with additional underground utilities, PHMSA requires operators to address the unique safety issues of their individual pipeline systems. This includes understanding and addressing environmental conditions, potential threats from other structures, or other risks to a pipeline's operational safety and integrity. In addition, while PHMSA does require pipeline operators to submit detailed reports concerning their pipeline systems, including mileage, inspections, repairs, and failures, these reports do not include details related the sharing of rights-of-way or impacts on other utilities. However, as stated throughout this document, the Project would be designed, constructed, operated, and maintained to meet or exceed the federal pipeline safety regulations which are set to protect the public from the risk of pipeline incidents. In addition, specific construction measures are being proposed for the Skillman Loop through the Princeton Ridge, as described in Transco's site-specific Rock Handling Plan prepared with input from Princeton Ridge stakeholders (see section 1.6.2).

Since 1982, operators have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts.

We received scoping comments regarding the safety history on Transco's entire existing pipeline system. Transco provided a summary of their onshore ruptures since 1984. This information is summarized in table 2.9.2-3.

TABLE 2.9.2-3

Transco Onshore Ruptures Since 1984 [a]

Cause	Number of Incidents	Fatalities (total)	Injuries (total)
Damage by outside force	6	0	3
Corrosion/External Corrosion	5	0	0
Other	3	0	0
TOTAL	14	0	3

[a] According to DOT Incident Reports (DOT-PHMSA 2012).

The Commission reviews each project based on its own merits and has siting authority for interstate natural gas infrastructure. PHMSA would be notified of and investigate all pipeline accidents and take any necessary resulting action. Although this information is not relevant to the scope of the Project, pipeline operator compliance and incident history is publically available on PHMSA website at www.phmsa.dot.gov/pipeline.

We received comments on the potential for the underground pipelines to be impacted by forces of nature, specifically hurricanes. As noted previously, the new pipeline would be constructed to meet the safety standards established by PHMSA in 49 CFR 192, which includes measures to protect pipelines from flooding events.

2.9.3 Impact on Public Safety

The service incident data summarized in table 2.9.2-1 include pipeline failures of all magnitudes with widely varying consequences. Table 2.9.3-1 presents the average annual fatalities that occurred on natural gas transmission lines between 2009 and 2013.

The data have been separated into employees and nonemployees to better identify a fatality rate experienced by the general public. Fatalities among the public averaged 2 per year over the 20 year period from 1994 to 2013. The majority of fatalities from natural gas pipelines are associated with local distribution pipelines. These pipelines are not regulated by the FERC; they distribute natural gas to homes and businesses after transportation through interstate transmission pipelines. In general, these distribution lines are smaller-diameter pipes and/or plastic pipes that are more susceptible to damage. In addition, local distribution systems do not have large rights-of-way and pipeline markers common to the FERC-regulated interstate natural gas transmission pipelines.

TABLE 2.9.3-1

Injuries and Fatalities – Natural Gas Transmission Pipelines

Year	Injuries	Fatalities	
		Employees	Public
2009	11	0	0
2010 [a]	61	0	0
2011	1	2	8
2012	7	0	0
2013	2	0	0

[a] All of the public injuries and fatalities in 2010 were due to the Pacific Gas and Electric pipeline rupture and fire in San Bruno, California on September 9, 2010.

The nationwide totals of accidental fatalities from various anthropogenic and natural hazards are listed in table 2.9.3-2 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines.

Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. Furthermore, the fatality rate is much lower than the fatalities from natural hazards such as lightning, tornados, floods, earthquakes, etc.

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1994 to 2013, there were an average of 62 significant incidents and 2 fatalities per year. The number of significant incidents distributed over the more than 300,000 miles of natural gas transmission pipelines indicates the risk is low for an incident at any given location. The rate of total fatalities for the nationwide natural gas transmission lines in service is approximately 0.01 per year per 1,000 miles of pipeline. Using this rate, operating the proposed 29.8 miles of pipeline looping associated with the Project might result in a fatality every 3,356 years. Thus, operation of the Project would represent only a slight increase in risk to the nearby public.

TABLE 2.9.3-2

Nationwide Accidental Deaths [a]

Type of Accident	Annual No. of Deaths
All accidents	117,809
Motor vehicle	43,343
Poisoning	23, 618
Falls	19,656
Drowning	3,582
Fire, smoke inhalation, burns	3,197
Floods [b]	89
Lightning [b]	54
Tornado [b]	74
Natural gas distribution lines [c]	14
Natural gas transmission pipelines [c]	2

[a] All data, unless otherwise noted, reflect 2009 statistics from U.S. Census Bureau, Statistical Abstract of the United States: 2012, Table 120, Washington, DC, 2009; http://www.census.gov/compendia/statab.

[b] NOAA National Weather Service, Office of Climate, Water and Weather Services, 30-year average (1983-2012); http://www.weather.gov/om/hazstats.shtml.

[c] DOT PHMSA, 2011. Significant Incidents Summary Statistics: 1994-2013, 20-year average (1994-2013); http://primis.phmsa.dot.gov/comm/reports/safety/.

2.10 CUMULATIVE IMPACTS

In accordance with NEPA, we considered the cumulative impacts of the proposed Project and other projects or actions in the area. Cumulative impacts represent the incremental effects of a proposed action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place in the same general area over a given period of time. The direct and indirect impacts of the Project are discussed in other sections of this EA.

The purpose of this analysis is to identify and describe cumulative impacts that would potentially result from implementation of the Project. This cumulative impact analysis generally follows the methodology set forth in relevant guidance (Council on Environmental Quality, 1997; EPA, 1999). Under these guidelines, inclusion of other actions within the analysis is based on identifying commonalities of impacts from other actions to potential impacts that would result from the Project. An action must meet the following criteria to be included in the cumulative impacts analysis:

- impact a resource area potentially affected by the Project;
- cause this impact within all, or part, of the Project area; and
- cause this impact within all, or part, of the time span for the potential impact of the Project.

The actions considered in this cumulative impact analysis may vary from the Project in nature, magnitude, and duration. We included these actions based on the likelihood of Project completion, and only projects that have been recently completed, are under construction, or are reasonably foreseeable future actions were evaluated. We further considered existing or reasonably foreseeable actions expected to affect similar resources during similar time periods with the proposed Project. The anticipated cumulative impacts of the proposed Project and these other actions are discussed below, as are pertinent mitigation measures. Anticipated cumulative impacts were based on NEPA documentation, agency and public input, and best professional judgment.

From a cumulative impacts perspective, the proposed Project would incrementally impact resources, such as land use and vegetation cover, and could contribute to a cumulative environmental impact when considered broadly with historical land use and development activity in the Project area. According to the NJDEP's most recent data, land use and land cover in the State of New Jersey has been altered from 1986 to 2007. In that timeframe, forested land use experienced a reduction of 2 percent; developed land increased by 6 percent; wetland cover decreased by 1 percent while waterbody cover increased by the same; and agriculture land use decreased by 4 percent (NJDEP, 2007). Developed land uses include a variety of sources, such as residential and urban development, and were tracked by the NJDEP through building permits. While this category may not necessarily apply to natural gas infrastructure, it provides the basis for a general analysis of historical cumulative environmental impacts in the state.

According to the Pennsylvania Governor's Center for Local Government Services (PAGCLGS) most recent data, between 1992 and 2005, developed (urban) land increased by 131.4 percent (about 1.6 million acres) primarily from agricultural and forest land. The total acreage of forest land remained relatively stable at the statewide level as conversions to urbanized areas were counterbalanced by afforestation of agricultural and other open space land. But the change in forest land composition had some noteworthy regional variations. Development pressures may have influenced this conversion as illustrated by the concentration of this change in land use occurring in areas surrounding Philadelphia and Pittsburgh and within the growing Poconos area. Conversion of forest land to agricultural land largely occurred in the western and southeastern portions of the state (PAGCLGS, 2010). Land cover related to wetlands and waterbodies was not covered in the PAGCLGS data.

Within this historical context we have identified three types of projects that would potentially cause a cumulative impact when considered with the Project. These are: 1) other FERC jurisdictional natural gas pipelines; 2) unrelated actions; and 3) Marcellus Shale development. We identified these projects, listed in table 2.10-1, through scoping and independent research, as well as information provided by Transco.

TABLE 2.10-1

Existing or Proposed Projects Evaluated for Potential Cumulative Impacts

Project	Primary Elements	Status	Location Relative to Project
FERC Jurisdictional Natural Gas Pipeline Projects [a]			
Transco Northeast Supply Link Project (CP12-30)	12 miles of pipeline in 3 loops on Leidy Line; 0.5-mile-long pipeline replacement; 27-mile-long pipeline uprate; 1 new compressor station; increase compression at existing stations.	In service November 2013.	6.6 miles of looping in Hunterdon County, NJ starts at termination of proposed Pleasant Run Loop of the Project; 3.2 miles of looping about 10 miles south of proposed Franklin Loop in Monroe County, PA; 2.2 miles of looping about 20 miles east of proposed modification at Compressor Station 520 in Lycoming County, PA; additional compression at Compressor Station 515 in Luzerne County, PA; new electric Compressor Station 303 in Essex County, NJ, about 30 miles from Project.
Transco Atlantic Sunrise Project (PF14-8)	177 miles of greenfield pipeline; 15 miles of pipeline loop; 2 new compressor stations; increase compression and modifications to existing stations.	Pre-filing review initiated April, 2014; proposed construction start June 2016; in-service July 2017.	Greenfield pipeline begins in Susquehanna County, PA and extends south to Transco's Mainline system in Lancaster County PA; includes pipeline construction in Luzerne, Lycoming, and Clinton Counties, PA; new compressor stations in Susquehanna and Columbia Counties, PA.
Transco Northeast Connector Project (CP13-132)	Increase compression at 3 existing stations.	Under construction; proposed in-service November 2014.	Includes uprating two existing electric motor drives for incremental increase of 5,000 horsepower at Compressor Station 205 in Mercer County, NJ; all work at station to be conducted inside existing building.
Transco Virginia Southside Expansion Project (CP13-30)	98 miles of pipeline; increase compression at existing stations.	Under construction; proposed in-service September 2015.	Includes minor modifications at Transco Compressor Station 205 in Mercer County, NJ (no added compression) and minor modifications at other existing aboveground facilities on Transco's Mainline system, some of which would be modified in the Project to remove odorant; pipeline component located more than 50

TABLE 2.10-1

Existing or Proposed Projects Evaluated for Potential Cumulative Impacts

Project	Primary Elements	Status	Location Relative to Project
			miles from Project.
Tennessee Gas Pipeline Northeast Upgrade Project (CP11-161)	40 miles of pipeline in 5 loop segments; increase compression at 2 existing stations.	In service November 2013.	Looping and compression modifications 20 to 40 miles from Project.
Dominion Transmission Tioga Area Expansion Project (CP 12-19)	15 miles of pipeline looping.	In service November 2013.	Looping in Tioga County, PA about 25 miles from Compressor Station 520.
Tennessee Gas Pipeline Rose Lake Expansion Project (CP13-3)	Increase compression at 3 existing stations.	Under construction; proposed in-service November 2014.	Nearest station at which compression will be added is about 25 miles from Compressor Station 517.
Columbia Gas Transmission East Side Expansion Project (CP14-17)	19 miles of pipeline loop; increase compression at 2 existing stations.	Application November 2013; proposed construction start November 2014; in-service September 2015.	Nearest station at which compression would be added is about 30 miles from termination of Pleasant Run Loop; pipeline element greater than 50 miles from Project.
Spectra Energy NJ-NY Expansion Project (CP11-56)	16 miles of pipeline; replace 5 miles of pipeline; abandon 3 miles of pipeline.	In service November 2013.	Approximately 30 miles from Skillman and Pleasant Run Loops in urban New York City area.
Transco Constitution Pipeline Project (CP13-499)	122 miles of pipeline; no added compression.	Application June 2013; proposed construction start 3rd quarter 2014; in-service March 2015.	Pipeline begins in Susquehanna County, PA about 35 miles from Project, and extends northeast into New York, with increasing distance from the Project.
Empire Pipeline/National Fuel Gas Tuscarora Lateral Project (CP14-112)	17 miles of pipeline; increase compression at existing station.	Proposed construction start November 2014; in service November 2015	Pipeline begins in northeastern-most Tioga County, PA, about 45 miles from Compressor Station 520, and about 100 miles from the Dorrance Loop. Tuscarora Lateral extends northwest, with increasing distance from the Project.
Dominion Transmission Sabinsville to Morrisville Project (CP12-20)	3.6 miles of pipeline; no added compression.	In service November 2013.	Pipeline located in northwestern Tioga County, PA, about 50 miles from Compressor Station 520, and more than 100 miles from the Dorrance Loop.
Texas Eastern Transmission TEAM Project (CP13-84)	34 miles of pipeline loop; increase compression at 4 existing stations.	Under construction; proposed in-service November 2014.	Project occurs on Texas Eastern Transmission system beginning in southeastern PA, extending west and south to MS. Nearest element would be about 50 miles from Project.
Transco Rockaway Lateral and Northeast Connector Project (CP13-36 and CP13-132)	3.2 miles of pipeline	Under construction; proposed in-service November 2014.	Project occurs in New York City. Nearest element would be about 50 miles from the Project.
Unrelated Projects			
Electric Generation and Transmission			
Pennsylvania Power and Light Northeast Pocono Reliability Project	60 miles of electric transmission line; associated substations.	Approved; phase construction planned 2014 – 2017.	69/230 kV powerline will parallel east side of Transco's existing right-of-way from about MP 65 to MP 69 of Franklin Loop, which would be installed on west side of existing right-of-way.

TABLE 2.10-1

Existing or Proposed Projects Evaluated for Potential Cumulative Impacts

Project	Primary Elements	Status	Location Relative to Project
Public Service Electric and Gas North Central Reliability Project	The project will upgrade transmission lines and substations in the northern and central regions of New Jersey.	In-service June 2014	Nearest approach of the electric transmission project is 5 miles northeast of Skillman Loop termination. Project primarily involves upgrades to existing facilities and rights-of-way.
Pennsylvania Power and Light Electric Utilities Susquehanna to Roseland 500kV Transmission Line Project	145 miles of electric transmission line; 90 percent collocated in existing powerline rights-of-way.	Under construction; in-service 2014	Nearest approach of the electric transmission project is 5 miles west of Dorrance Loop. This segment of the project primarily involves upgrades to existing facilities.
Commercial/Residential Development	Various; see text discussion below	On-going	Commercial and residential development projects in the counties crossed by the Project.
Marcellus Shale Development			
Wells [b]	Natural gas well drilling	On-going	Active drilling in Lycoming County, PA, where Transco proposes to increase compression at existing Compressor Station 520. No active drilling in immediate vicinity of Compressor Station 520 and no drilling in last 3 years in other PA counties where the Project would be located. No Marcellus Shale development in NJ.

[a] Projects recently completed, under construction, or expected to be under construction in the same timeframe as, and located within approximately 50 miles of, the Leidy Southeast Expansion Project.

[b] Well drilling activity within the same counties as the Leidy Southeast Expansion Project; see text below for additional details.

2.10.1 FERC Jurisdictional Natural Gas Pipeline Projects

The Commission recently approved or is in the process of reviewing several natural gas transmission projects within 50 miles of the proposed Project facilities. A summary of each project is included in table 2.10-1, and additional details regarding each project, and its associated environmental impacts, can be obtained through our website at www.ferc.gov by utilizing the e-Library link and the docket number for each project.

Based primarily on the scope, schedule, status, and distance from the proposed Leidy Southeast Expansion Project, the following projects, together with the proposed Project, would not be expected to contribute significantly to cumulative impacts in the area: the Northeast Connector Project; Virginia Southside Expansion Project; Northeast Upgrade Project; Tioga Area Expansion Project; Rose Lake Expansion Project; East Side Expansion Project; NJ-NY Expansion Project; Constitution Pipeline Project; Tuscarora Lateral Project; Sabinsville to Morrisville Project; TEAM Project; Rockaway Lateral; and Northeast Connector Project. In addition, all FERC jurisdictional projects have been and would be constructed and maintained in accordance with our approved procedures and other construction, operation, and mitigation measures that may be required by federal, state, or local permitting authorities, further reducing the potential for cumulative impacts to occur. Therefore, the above-listed FERC jurisdictional projects are not considered further in our analysis.

We further consider the potential cumulative impacts of the Project and the Northeast Supply Link (NSL) Project and Atlantic Sunrise Project.

As indicated in table 2.10-1, the NSL Project went into service in late 2013 and consists of the following primary facilities:

- Muncy Loop – 2.2 miles of pipeline loop on Transco's Leidy Line in eastern Lycoming County, Pennsylvania. The Muncy Loop is located approximately mid-way between Compressor Stations 517 and 520, which would be modified by the Project, and about 40 miles west of the proposed Dorrance Loop in Luzerne County, Pennsylvania;

- Palmerton Loop – 3.2 miles of pipeline loop on Transco's Leidy Line in southern Monroe County, Pennsylvania. The Palmerton Loop is located approximately 15 miles southeast of the proposed Franklin Loop;

- Stanton Loop – 6.6 miles of 42-inch-diameter pipeline loop on Transco's Leidy Line in Hunterdon County, New Jersey. The proposed Pleasant Run Loop would connect to the Stanton Loop at MP 6.9 and would utilize similar workspace at this location as used during construction of the Stanton Loop;

- Modifications without added compression at Compressor Station 505, where the proposed Pleasant Run Loop would begin in Somerset County, New Jersey;

- Installation of an additional 16,000-hp gas turbine compressor in a new building at Compressor Station 515 in Luzerne County, Pennsylvania. In conjunction with the proposed Project, Transco would install a 30,000-hp gas turbine compressor at the station; and

- Construction of new, 25,000 hp electric driven Compressor Station 303 in Essex County, New Jersey, approximately 35 miles from the nearest Project facilities.

Construction of the NSL Project was completed in 2013 and the project was placed into service in November. If the current Project is approved, the majority of construction would likely occur in 2015, or approximately 18 months after completion of the NSL Project. Based primarily on the scope, timing, and distance between major components of the NSL Project and the Leidy Southeast Expansion Project, and considering that both projects have been and would be constructed and maintained in accordance with our approved procedures and other construction, operation, and mitigation measures that may be required, we expect that there would be no cumulative impacts associated with construction of the projects. Potential long-term cumulative impacts of the projects are discussed in section 2.10.4.

As indicated in table 2.10-1, we initiated our pre-filing review of Transco's planned Atlantic Sunrise Project in April 2014. If that project is approved, Transco would likely start construction in summer 2016 with an in-service date in summer 2017. Based on an initial project description from Transco, the project consists of the following primary facilities:

- Central Penn Line North (CPLN) and Central Penn Line South (CPLS) – 177 miles of pipeline extending southerly from Susquehanna County, Pennsylvania to an interconnection with Transco's Mainline system in Lancaster County,

Pennsylvania. The CPLN would parallel the Leidy Line for 21 miles in northern Luzerne County, approximately 20 miles from the Dorrance and Franklin Loops;

- Grugan Loop – 5.5 miles of pipeline loop on Leidy Line in Clinton County, Pennsylvania about 15 miles west of Compressor Station 520;

- Unity Loop – 9.0 miles of pipeline loop on the Leidy Line in Lycoming County, immediately west of Compressor Station 517;

- Two new electric-driven compressor stations including on the CPLN pipeline in Susquehanna County and on the CPLS pipeline in Columbia County, Pennsylvania, about 10 miles south of existing Compressor Station 517; and

- Increased compression at Compressor Stations 517 and 520, where Transco proposes to increase compression in conjunction with the Leidy Southeast Expansion Project, and modifications at four other existing compressor stations on Transco's Mainline system that would also be modified by the Leidy Southeast Expansion Project.

Detailed information regarding the environmental impacts associated with the Atlantic Sunrise Project is not yet available. However, we note that none of the pipeline construction would occur within 20 miles of the proposed Dorrance and Franklin Loops and that construction schedules, including at existing compressor stations, would be separated by a minimum of 6 months. Based primarily on the timing and distance between major components of the Atlantic Sunrise Project and the Leidy Southeast Expansion Project, and considering that both projects would be constructed and maintained in accordance with Transco's Plan and Procedures and other construction, operation, and mitigation measures that may be required by other permitting agencies, we expect that there would be no cumulative impacts associated with construction of the projects. Potential long-term cumulative impacts of the projects are discussed in section 2.10.4.

2.10.2 Unrelated Projects

Electric Generation and Transmission Projects

We are aware of three major electric transmission projects in the general Project area: the Northeast Pocono Reliability Project; North Central Reliability Project; and the Susquehanna to Roseland 500kV Transmission Line Project.

As indicated in table 2.10-1, the Northeast Pocono Reliability Project has been approved, and phased construction is planned between 2014 and 2017. A portion of the electric transmission project would parallel the east side of Transco's existing right-of-way from approximate MPs 65.0 to 69.0 in Monroe County, Pennsylvania. In this area, Transco proposes to construct the Franklin Loop along the west side of the existing pipeline right-of-way. Due to the proximity of the Northeast Pocono Reliability Project to the Franklin Loop, and the potential for construction schedules to overlap, we discuss potential short and long-term cumulative impacts of the projects in section 2.10.4.

According to Public Service Electric and Gas Company (PSE&G), construction of the North Central Reliability Project was largely completed by June 2014. The project involved upgrading approximately 35 miles of existing PSE&G transmission lines and substations in northern and central areas of New Jersey. The nearest distance of the electric transmission project to the Leidy Southeast Expansion Project is about 5 miles from the termination of the Skillman Loop. As the project largely involved upgrades to existing facilities rather than new facilities that would require substantial ground disturbance, and considering that the construction periods for the electric transmission project and Transco's proposal would not overlap, it is expected that the cumulative impacts of the two projects would be minimal and, thus, we do not consider the North Central Reliability Project further in our analysis.

Similarly, construction of the Susquehanna-Roseland Electric Transmission Line Project is nearing completion through northern Pennsylvania and New Jersey, and in-service is expected in the summer of 2014. The nearest distance of the project to the Leidy Southeast Expansion Project is about 5 miles from the termination of the Dorrance Loop in Luzerne County, Pennsylvania. In this area, the electric transmission project largely consists of upgrading existing facilities. In addition, approximately 90 percent of the transmission line project would occur within existing power line right-of-way, without significant land disturbance outside of the right-of-way. Based on the narrow scope and distance of the electric transmission project, and considering that the construction schedules for the electric transmission project and Transco's proposal would not overlap, it is expected that the cumulative impacts of the two projects would be minimal. Therefore, we do not consider the North Central Reliability Project further in our analysis.

Commercial/Residential Development Projects

Transco identified planned commercial/residential development projects in the counties that would be crossed by the Project. While there is a potential for increased construction-related traffic should any of these planned projects occur within the same timeframe and location as the proposed Project, the exact location and schedule for all of these projects was not determined and the schedule for many projects is unknown, variable, and dependent on economic factors. In addition, the majority of these projects consist of short-term, localized activities (e.g. small number of homes, small retail developments), and/or are scheduled for completion prior to substantial construction of the proposed Project. We expect that these projects would require state or local approval and that best management practices would be implemented to minimize environmental impacts such as erosion and sedimentation. As a result and considering that the Project would be constructed and operated in accordance with Transco's Plan and Procedures and other measures that may be required by federal, state, or local permitting authorities, we conclude that construction and operation of the Project and commercial/residential development projects would result in negligible cumulative impacts in the region. Therefore, we do not consider these projects further in our analysis.

2.10.3 Marcellus Shale Development

The Marcellus Shale is an approximately 385-million-year-old, organic-rich shale formation that exists beneath 93 million acres of Pennsylvania, southern New York, eastern

Ohio, and northern West Virginia. The Marcellus Shale does not extend beneath the New Jersey components of the Project.

Over geologic time and with the pressure and temperature associated with deep burial, oil and natural gas can be generated within organic-rich shale formations. However, because shale is generally impermeable (i.e., fluids do not readily flow through the formation), the oil and natural gas contained in these types of rocks cannot be economically produced using conventional well drilling and completion methods. Within the last 20 years, however, the petroleum industry has developed the horizontal drilling technique in conjunction with hydraulic fracturing (fracking), which has been in use for over 50 years, to recover natural gas from shale reservoirs. Fracking involves the injection of fluids and sand under high pressure to fracture the shale around the wellbore, thus enabling the flow of natural gas and oil to the well.

Using these techniques, the first natural gas production from the Marcellus Shale in Pennsylvania began in 2005. Prior to 2005, Pennsylvania was producing approximately 0.5 billion cubic feet per day (Bcf/d) of natural gas from conventional reservoirs. With development of the Marcellus Shale, Pennsylvania produced 9.2 Bcf/d during the last six months of 2013. The USGS estimates that the Marcellus Shale contains a technically recoverable mean of 84 trillion cubic feet (tcf) of natural gas (Coleman, et al., 2011). For comparison, the United States currently utilizes approximately 23 tcf of natural gas per year; thus, the Marcellus Shale represents a significant natural gas deposit in close proximity to the high population centers of the northeastern United States.

We received comments from the Sierra Club, Delaware Riverkeeper Network, and numerous individual stakeholders concerning the FERC's jurisdiction over these "upstream" production activities. As discussed in section 1.5, the facilities associated with the production of natural gas are not under the FERC's jurisdiction. Although we do not examine the impacts of Marcellus Shale upstream facilities to the same extent as the Project facilities in this EA, we considered the general development of the Marcellus Shale in proximity to the Project within the context of cumulative impacts in the Project area. A more specific analysis of Marcellus Shale upstream facilities is outside the scope of this analysis because the exact location, scale, and timing of future facilities are unknown.

Marcellus Shale production involves improvement or construction of roads, preparation of a well pad, drilling and completion of wells, and construction and operation of gathering pipeline systems. In Pennsylvania, the permitting of upstream facilities associated with the development of the Marcellus Shale is under the jurisdiction of the PADEP Bureau of Oil and Gas Management. The PADEP has developed BMPs for the construction and operation of upstream oil and gas production facilities. These BMPs include erosion and sediment control practices; setback requirements from springs, wetlands, and waterbodies; wetland and waterbody crossing procedures; access road construction practices; soil amendment procedures; and right-of-way restoration measures.

According to PADEP records, 405 unconventional wells, (wells that recover natural gas from shale formations often through the use of fracking) were drilled in Lycoming County in 2012, 2013 and through May 2014 (PADEP, 2014a). The only element of the proposed Project in the area of active Marcellus development is Transco's proposed increase of compression at existing Compressor Station 520 in west-central Lycoming County. This work would occur in or

adjacent to the developed area of the site and would not involve significant impacts on water resources, vegetation, wildlife, or other resources. Transco would also implement measures to avoid or further reduce environmental impacts during construction and to encourage restoration after work is complete. The Project and Marcellus Shale development would potentially have a cumulative impact on air quality. As discussed in section 2.7, the compressor station modifications would comply with Pennsylvania's SIP, which was established to protect public health and the environment. Facilities associated with Marcellus Shale development would comply with the CAA, as applicable. In addition, Governor Thomas Corbett signed the 2012 Oil and Gas Act, also known as Act 13, which addressed unconventional drilling in Pennsylvania. The PADEP is proposing amendments to Act 13, which include additional preventive measures to protect environmental resources (PADEP, 2014b). No wells have been drilled in the last three years in the other Pennsylvania counties where Project work would occur, and the Marcellus Shale does not extend into New Jersey.

Based on the analysis above, for most environmental resources we conclude that construction and operation of the Project would not contribute significantly to cumulative impacts associated with development of the Marcellus Shale. However, we discuss the potential for cumulative impacts on air quality in section 2.10.4.

2.10.4 Potential Cumulative Impacts of the Proposed Action

The potential impacts that we view as most cumulatively significant pertain to soils; groundwater, surface water, and wetlands; vegetation and wildlife; land use, recreation, special interest areas, and visual resources; air quality and noise; and climate change.

In the following analysis we discuss the potential cumulative impacts of the proposed Leidy Southeast Expansion Project relative to Transco's recently completed NSL Project and recently proposed Atlantic Sunrise Project, the planned Northeast Pocono Reliability Project, and the development of the Marcellus Shale.

Soils

The facilities associated with the Project would have a direct but temporary impact on near-surface soils. During construction, temporary impacts on soils could lead to poor revegetation potential and indirectly affect wildlife and aquatic resources as a result of poor vegetation cover and increased erosion and sedimentation. The soil stabilization and revegetation requirements included in Transco's Plan and Procedures, E&SCPs, and other site-specific plans including the PRCRP developed for the Princeton Ridge area along the Skillman Loop, would prevent or minimize any indirect impacts on soils. Revegetation of the right-of-way in accordance with these plans and other measures that may be required by permitting agencies, would minimize impacts on soils. FERC staff would monitor and inspect construction and restoration activities to ensure compliance. The NSL and Atlantic Sunrise Projects, which are under our jurisdiction, have already implemented or would be required to implement similar construction and restoration practices to minimize impacts on soils. Consequently, any potential cumulative impacts on soils would be temporary and minor with respect to the FERC jurisdictional projects that we considered in our analysis.

Construction and operation of the Northeast Pocono Reliability Project would result in temporary impacts on soils during construction and the placement of powerline towers would result in permanent impacts on soils. Cumulative impacts on soils from construction of the Northeast Pocono Reliability Project and the Leidy Southeast Expansion Project would be expected to be temporary and minor because the construction work areas would not overlap and workspaces would be restored following construction. The placement of tower structures would represent a permanent impact on soils; however, the long term cumulative impacts on soils from the Northeast Pocono Reliability Project and the proposed Project would be minor due to the relatively small footprint of the powerline structures and considering that Transco would implement measures avoid or minimize any long term impacts on soil resources.

In conclusion, we do not anticipate that construction or operation of the Project would contribute significantly to cumulative impacts on soil resources when considered in conjunction with other projects in the area.

Groundwater, Surface Water, Aquatic Resources, and Wetlands

Project construction could have a minor, temporary, and localized effect on groundwater, surface water, and aquatic resources. Groundwater impacts could include increased turbidity, reduced water levels, and contamination. Nearby water wells could also be damaged by construction. The greatest potential impacts of pipeline construction on surface waters and aquatic resources would result from an increase in sediment loading to surface waters either during active construction within a waterbody or due to runoff from construction near waterbodies, and would quickly diminish after construction, as the right-of-way is restored and revegetated. The level of impact of the Project on surface waters would depend on precipitation events, sediment loads, stream area/velocity, channel integrity, and bed material. Effects on fishery resources crossed by the Project would be reduced through the use of the various waterbody crossing methods and restoration procedures, by minimizing the duration of in-stream work, and by conducting in-stream work within the time periods required by federal and state agencies.

Project impacts on water resources would be greatest during construction. Furthermore, Project impacts on water resources would be avoided or minimized by the use of standard and specialized construction techniques, including those specified in Transco's Procedures, SPCC Plan, and other site-specific plans. Transco would require approximately 12.1 million gallons of surface water to hydrostatically test the new pipeline facilities and would follow federal, state, and local permit requirements with regard to water withdrawal and discharges. Transco would implement the measures to protect aquatic species and minimize sedimentation in the source and receiving waterbodies. Transco would also monitor nearby well performance and repair any wells affected by the Project. As mentioned above, the NSL Project and the Atlantic Sunrise Project, which are under our jurisdiction, have already been or would be required to implement similar construction and restoration practices to minimize impacts on water resources. The NSL Project and the Leidy Southeast Expansion Project would not cross any of the same waterbodies and, based on geographic separation, it is unlikely that the Atlantic Sunrise Project and the Leidy Southeast Expansion Project would cross the same waterbodies. This geographic separation and/or differing construction schedules would further reduce the potential for cumulative impacts

to occur. As a result, we expect that cumulative impacts on water resources, aquatic species would be temporary and minor with respect to the FERC-regulated projects we considered.

Cumulative impacts on groundwater, surface water, and aquatic resources from construction of the Northeast Pocono Reliability Project would be expected to be temporary and minor as the Public Utility Commission and other permitting agencies would require best management practices to protect water resources and aquatic resources. Following construction, vegetation would be restored in the work area, thereby reducing potential long-term effects. Minor permanent impacts on vegetation would occur from the powerline structures; however, impacts on surface waters would likely be avoided because the towers are typically placed in upland areas and the powerlines would span surface waters.

Construction of the Project would impact 26.5 acres of wetlands, consisting of 15.1 acres of emergent wetland, 2.9 acres of scrub-shrub wetland, and 8.5 acres of forested wetlands. Of the 8.5 acres of forested wetland impacts, 4.3 acres would be permanently impacted during operation and would be converted to emergent wetland types due to vegetation maintenance requirements along the pipeline loops. The primary impact of the Project on wetlands would be the alteration of wetland value due to vegetation clearing. Impacts on wetlands would be greatest during and immediately following construction. The majority of these effects would be short term in nature and would cease when or shortly after the wetlands are restored and vegetated. The COE and NJDEP oversee permitting of wetland impacts in Pennsylvania and New Jersey, respectively, and Transco has proposed wetland enhancement and preservation at one site in Pennsylvania and is coordinating with the NJDEP to identify acceptable compensation for temporary wetlands impacts associated with the Project in New Jersey.

Construction of the NSL Project impacted approximately 13.8 acres of emergent wetlands and 3.7 acres of forested wetlands. Operation of the NSL Project resulted in in 1.1 acres of permanent wetland impacts, including 0.4 acre of emergent wetland and 0.1 acre of forested wetland fill at the electrical substation associated with the project, and 0.6 acre of forested wetland that was converted to emergent wetland types for operation of the pipeline right-of-way. Construction and operation of the Atlantic Sunrise project would likely result in temporary impacts on wetlands and potential permanent impacts from the conversion of forested wetlands to non-forested wetland types, or by operation of the aboveground facilities. These projects have implemented, or would be required to implement, measures to minimize wetland impacts, including complying with permitting requirements from the COE and other agencies. In addition, the geographic separation of the projects from the proposed Project would further reduce cumulative impacts on wetlands. As such, we conclude that cumulative impacts on wetlands from the FERC-regulated projects would be minor.

Construction of the Northeast Pocono Reliability Project would be expected to result in temporary impacts on wetlands during the period of construction, and permanent impacts on any wetlands associated with the placement of powerline towers. Wetland impacts associated with the powerline project and the proposed Project could occur in nearby areas and during similar timeframes; however, both projects would include construction and restoration measures that would reduce impacts on wetland resources, and it is expected that both projects would implement mitigation plans in accordance with COE or other permitting agency requirements, thereby minimizing any long term cumulative impacts on wetland resources.

In conclusion, we do not anticipate that construction or operation of the Project would contribute significantly to cumulative impacts on water resources, aquatic species, or wetlands when considered in conjunction with other projects in the area.

Vegetation and Wildlife

Right-of-way clearing and grading and other construction activities associated with the proposed Project would result in the removal of vegetation; alteration of wildlife habitat; displacement of wildlife; and other potential secondary effects such as increased population stress, predation, and the establishment of invasive plant species. In addition to the wetland impacts noted above, construction of the Project would temporarily impact about 457.6 acres of vegetated upland, of which about 73.0 acres would be retained for permanent operation. The Project would result in the permanent loss of approximately 1.4 acres of upland vegetation, and would convert about 26.8 acres of upland forest to scrub-shrub or herbaceous vegetation cover.

Due to the short time frames for construction, the proposed Project, NSL Project, Atlantic Sunrise Project, and Northeast Pocono Reliability Project would not contribute significantly to cumulative impacts on vegetation and wildlife resources in the region. We consulted with the FWS in accordance with Section 7 of the ESA to ensure that impacts on threatened and endangered species are avoided, minimized, and where necessary, appropriately mitigated for the proposed Project and the NSL Project. We also consulted with the FWS regarding impacts on migratory bird species of concern for each of these projects, and would conduct similar consultations for the Atlantic Sunrise Project. Transco has also consulted with state regulatory agencies to minimize potential impacts on state-listed species of concern and would implement measures, such as construction timing restrictions, that would minimize potential cumulative effects on fish and other species. Consultations related to Section 7 of the ESA would be expected to occur for the Northeast Pocono Reliability Project.

The development of the proposed Project and other projects in the area could result in habitat fragmentation, although the cumulative impact of the Project on fragmentation is considered to be minor for a number of reasons. The proposed pipeline segments would be installed as loops within and adjacent to Transco's existing maintained right-of-way for the majority of their length and the proposed aboveground facility modifications would occur within or adjacent to the fence lines of existing facilities. In addition, Transco would primarily use existing roads to construct and operate the proposed facilities and no other linear elements (e.g., electric transmission lines), would be constructed. Therefore, the Project would utilize previously disturbed rights-of-way as much as possible, thereby minimizing the areas of previously undisturbed vegetation that would be affected, and reducing additional cumulative impacts on vegetation communities and wildlife habitats, including migratory birds. The potential for habitat fragmentation resulting from the Project would be further reduced because the majority of the disturbed areas would be allowed to return to pre-existing conditions. The geographic extent and duration of disturbances caused by construction of the Project would be minimal and further reduced by implementation of Transco's Plan and Procedures, E&SCPs, and other construction, restoration, and mitigations plans.

In conclusion, we do not anticipate that construction or operation of the Project would contribute significantly to cumulative impacts on vegetation or wildlife resources when considered in conjunction with other projects in the area.

Land Use, Recreation, Special Interest Areas, and Visual Resources

Construction and operation of the proposed Project has been designed to minimize impacts on existing and future land uses by collocation with an existing Transco right-of-way to the extent possible. The new permanent right-of-way for the Project would result in the permanent alteration of about 26.8 acres of upland forest land to scrub-shrub or herbaceous cover. All other land use types are anticipated to be restored after construction, thus, Project effects on land use would be minimal.

During construction, recreational activities or the use of special interest areas could be prevented, postponed, or diminished in the immediate Project area. Effects on these areas would be minimized by utilizing existing rights-of-way and access roads to the extent possible and by a relatively short duration for construction. The Project would not cross national or federal recreation areas. However, the Project would cross state and local recreation and special interest areas. Transco has begun coordinating with the appropriate state and local land management agency for the special interest areas and would obtain the necessary state permits and approvals to cross these areas.

The Atlantic Sunrise Project and Northeast Pocono Reliability Project would affect land use and result in temporary and long term visual impacts, and could impact recreational activities and special interest areas if crossed by the projects. These projects, however, would not be expected to significantly impact these resources as they would be required to implement our Plan and Procedures and/or would be required to implement similar construction and restoration practices to minimize impacts on land use. Similarly, construction of the NSL Project was completed in accordance with our recommendations and measures in our Plan and Procedures to minimize impacts on land use.

The other FERC-jurisdictional projects have crossed or may cross federal, state, or local recreation and special interest areas. It is anticipated that these other projects have or would coordinate similarly with the land management agency to obtain the necessary permits and approvals to cross these areas, as well as to develop mitigation for each project's impacts. While construction of these projects through the recreation and special interest areas could affect recreational activities, the majority of these impacts would be temporary, extending though the period of construction.

Temporary visual impacts would be evident during Project construction due to clearing, grading, and construction activities. After construction, restoration in accordance with Transco's Plan and Procedures and other permitting agency requirements would promote revegetation of the construction work areas, thereby limiting permanent visual impacts to those areas where previously existing forest would not be allowed to reestablish within the new permanent right-of-way due to pipeline safety and operational requirements. Permanent visual impacts would also occur in developed areas where trees and certain permanent structures would be precluded in the operational right-of-way, and where permanent structures (e.g., transmission line posts) would

occur. Placement of the permanent powerline structures associated with the Northeast Pocono Reliability Project adjacent to the proposed Project right-of-way would also represent a permanent, long-term impact on visual resources.

Because the proposed loops would be collocated within or adjacent to Transco's existing permanently maintained right-of-way for the majority of their length, the permanent visual impact would typically consist of the incremental widening of the existing corridor. The scope of work at aboveground facilities associated with the Project, including those that would also be modified in conjunction with the Atlantic Sunrise Project, would consist of modifications to existing structures and, thus, would not result in significant cumulative impacts on visual resources.

Based on the above, construction and operation of the Project would not contribute to cumulative, long-term impacts on land use, recreation, special interest areas, and visual resources within the region.

Air Quality and Noise

The proposed Project and other projects in the area would involve the use of heavy equipment that would generate emissions of air contaminants, fugitive dust, and noise during construction. Because pipeline construction moves through an area quickly, air emissions associated with the pipeline loops would be intermittent and short term. The majority of these impacts would be minimized further because the construction activities would occur over a large geographical area and, in many cases, construction schedules would not directly overlap. Although these projects would result in short-term construction air emissions, they are not likely to significantly affect long-term air quality in the region.

Operation of the proposed Project and other projects would also contribute cumulatively to existing air emissions. Although outside the scope of our analysis, it is anticipated that Marcellus Shale development activities would result in increased long-term emissions of criteria pollutants, HAPs, and GHGs within the region. The NSL Project involved the addition of 16,000 hp of compression to Station 515 (which is also being modified for the Project) and the Atlantic Sunrise Project would involve addition of compression at Stations 517 (additional 16,000 hp) and 520 (additional 16,000 hp and compressor modifications). However, each of the projects would need to comply with federal, state, and local air regulations, which may require controls to limit the emission of certain pollutants. These air regulations also require the jurisdictional agency to consider the timing of projects in determining the applicable requirements (such as the applicability of NSR or PSD). The limits on operating emissions would be implemented through federal, state, and local permits and approvals. Thus, the Project is not anticipated to significantly contribute to the cumulative impact on regional air quality as a result of operation. In addition, SIPs are designed to ensure compliance with the NAAQS, or to bring nonattainment areas into compliance. As a result, the proposed Project, other similar projects, and Marcellus Shale development in the area are not expected to have a significant cumulative impact on air quality as it relates to human or public health.

The Project and other projects would all produce noise during construction; however, this noise would be temporary disturbances to noise receptors in the vicinity of the projects.

Noise impacts during the construction phase would also be localized and would attenuate quickly as the distance from the noise source increases. In addition, because construction proceeds as a moving assembly line along the proposed pipeline loops, the duration of construction activities, and therefore noise impacts, at any one location would be limited and short term. Because the impact of noise is highly localized and attenuates quickly as the distance from the noise source increases, cumulative impacts associated with the Project, including operation of the new and modified compressor stations, would not result in significant cumulative impacts. In addition, section 2.8 describes the noise impacts from the proposed compressor station modifications. The resulting noise from each compressor station after Transco's modifications would either not produce a noticeable increase or reduce noise from current levels.

Climate Change

Climate change is the change in climate over time, whether due to natural variability or as a result of human activity, and cannot be represented by single annual events or individual anomalies. For example, a single large flood event or particularly hot summer are not indications of climate change, while a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change.

The Intergovernmental Panel on Climate Change (IPCC) is the leading international, multi-governmental scientific body for the assessment of climate change. The United States is a member of the IPCC and participates in the IPCC working groups studying various aspects of climate change. The leading U.S. scientific body on climate change is the U.S. Global Change Research Program (USGCRP). Thirteen federal departments and agencies participate in the USGCRP, which began as a presidential initiative in 1989 and was mandated by Congress in the Global Change Research Act of 1990 (GCRA). The USGCRP coordinates and supports U.S. participation in the IPCC assessments.

The IPCC and USGCRP have recognized that:

- globally, GHGs have been accumulating in the atmosphere since the beginning of the industrial era (circa 1750);
- combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture and clearing of forests, is primarily responsible for the accumulation of GHG;
- anthropogenic GHG emissions are the primary contributing factor to climate change; and
- impacts extend beyond atmospheric climate change alone, and include changes to water resources, transportation, agriculture, ecosystems, and human health.

In May 2014, the USGCRP released the Third National Climate Assessment, a comprehensive report on climate change and its impacts in the United States. The report describes the effects of global change on different regions of the U.S. (e.g., Northeast) and on various societal and environmental sectors, such as water resources, agriculture, energy use, and human health (USGCRP, 2014). These efforts are intended to fulfill the Congressional mandate

of the GCRA. Although climate change is a global concern, for this analysis, the focus is on the cumulative impacts of climate change in the Project area.

The USGCRP's report notes the following observations and projections of environmental impacts that may be attributed to climate change in the Northeast region:

- between 1895 and 2011, temperatures in the Northeast increased by almost 2 °F and precipitation increased by approximately five inches, or more than 10 percent;
- by the 2080s, if GHG emissions continue to increase warming of 4.5 °F to 10 °F is projected while warming ranges from about 3 °F to 6 °F are projected if global emissions were reduced substantially;
- coastal flooding has increased due to a rise in sea level of approximately 1 foot since 1900;
- the Northeast has experienced a greater recent increase in extreme precipitation than any other region in the United States; between 1958 and 2010, the Northeast saw more than a 70 percent increase in the amount of precipitation falling in very heavy events;
- the frequency, intensity, and duration of heat waves is expected to increase, with larger increases under higher emissions;
- under the scenario of continued increases in emissions, much of the southern portion of the region, including New Jersey, is projected by mid-century to experience more than 60 additional days per year above 90 °F compared to the end of last century. This will affect the region's vulnerable populations, infrastructure, agriculture, and ecosystems;
- although less certain than temperature increase projections, winter and spring precipitation is projected to increase, especially but not exclusively in the northern part of the region and the frequency of heavy downpours is projected to continue to increase as the century progresses;
- seasonal drought risk is also projected to increase in summer and fall as higher temperatures lead to greater evaporation and earlier winter and spring snowmelt; and
- sea level rise along most of the coastal Northeast is expected to exceed the global average rise (which is projected to rise 1 to 4 feet by 2100) due to local land subsidence, with the possibility of even greater regional sea level rise if the Gulf Stream weakens as some models suggest.

The GHG emissions associated with construction and operation of the Project were identified in section 2.7.3. Emission of GHGs from the Project would not have any direct impacts on the environment in the Project area. Currently, there is no standard methodology to determine how the Project's relatively small incremental contribution to GHGs would translate into physical effects on the global environment.

The GHG emissions from the construction and operation of Transco's Leidy Southeast Expansion Project would contribute less than 0.1 percent of the New Jersey or Pennsylvania GHG emission inventories. Additionally, natural gas is a lower CO_2 emitting fuel as compared to other fuel sources (e.g., fuel oil or coal). Because fuel oil is widely used as an alternative to natural gas in the region in which the Project would be located, it is anticipated that the Project would result in the displacement of some fuel oil use, thereby regionally offsetting some GHG emissions. In addition, the Project would comply with all EPA GHG regulations. While the proposed Project would represent an incremental increase in GHG emissions, we do not believe it would contribute significantly to climate change.

In conclusion, various development types, including interstate natural gas transmission projects, electric transmission projects, and natural gas development activities have contributed over time to the reduction in forested land use and waterbody cover. The proposed Project would have a minor impact on these resources. Transco would loop its existing pipelines, utilizing existing cleared areas during construction and, thereby, reducing the acreage of tree loss required during construction. For linear pipelines, such as the proposed action, areas used during construction and operation are generally restored to previous conditions. Project-related impacts on agriculture and soils would be limited to the construction phase of the Project. Once the pipeline loops are in operation, the land would be reverted to previous uses in most instances. Transco would implement its Plan, Procedures, and PRCRP, among other plans, to reduce construction impacts and ensure successful revegetation of disturbed areas. In addition, Transco is consulting with the COE and NJDEP to identify and implement appropriate wetland mitigation and offset the Project's impacts on wetlands. Along the Skillman Loop, Transco would largely avoid a reduction in canopy cover and reduce tree clearing along its existing right-of-way by maintaining its current right-of-way width and constructing over the existing pipeline. By avoiding forest fragmentation Transco would, by extension, reduce impacts on wildlife and wildlife habitat.

3.0 ALTERNATIVES

We identified and evaluated alternatives to the Project including the no action alternative; energy conservation and alternative sources of energy; system alternatives; pipeline route alternatives, variations and refinements; and alternative construction methods. The criteria used to evaluate potential alternatives included whether they:

- offer a significant environmental advantage over the proposed Project;
- are technically and economically feasible and practical;
- are permittable within the same general timeframe of the Project; and
- meet Transco's stated Project objectives, which are to:
    - provide an additional 525,000 Dth/d of firm natural gas transportation capacity to delivery points that would be accessible by customers in the mid-Atlantic and Southeast states
    - help to meet the current and future demand for natural gas;
    - provide its customers with access to new sources of domestic natural gas; and
    - support the overall reliability of energy transmission infrastructure.

Our alternatives analysis is based on information provided by Transco; our review of aerial photographs, USGS topographic maps, and other publicly available information; information from site visits; and input from resource agencies and the public. Unless noted otherwise, we utilized the same assumed land requirement widths and the same desktop sources of information to standardize the comparison between the Project and alternatives. Therefore, some of the information presented in this section relative to the Project may differ from the information presented in section 2.0, which is based on Project-specific sources of information including field surveys and engineered drawings.

3.1 NO ACTION ALTERNATIVE

If the Commission denies Transco's proposal, the short- and long-term environmental impacts identified in this EA would not occur. However, the Project shippers would need to obtain equivalent capacity from either new or existing pipeline systems to transport the volume of natural gas contracted through the Project's binding precedent agreements. As discussed in section 3.3.1, we did not identify any other existing pipeline systems in the region that could provide the capacity of the Project. Therefore, the construction of new natural gas facilities would likely result in similar or greater impacts than those associated with the Project to provide the subscribed capacity.

Therefore, the No Action Alternative is not considered reasonable because it would not accomplish the Project objectives and would likely result in the construction of other facilities that would not offer a significant environmental advantage over the Project.

3.2 ENERGY CONSERVATION OR ALTERNATIVE ENERGIES

We considered whether energy conservation or other sources of energy, including other fossil fuels, nuclear energy, or renewable technologies, could meet the equivalent energy that would be provided by the Project. Coal, oil, and nuclear energy currently provide a substantial portion of the nation's energy, and conservation and renewable technologies are expected to play an increasing role in meeting future energy needs. However, due to environmental, safety, regulatory, and technologic limitations, conservation programs and other energy sources would either be unable to provide the equivalent energy of the Project, would not offer an environmental advantage over the Project, or would not be available within the timeframe of the Project. Therefore, energy conservation or alternative energies are not viable alternatives to the Project.

3.3 SYSTEM ALTERNATIVES

System alternatives would make use of other existing, modified, or proposed pipeline systems to meet the stated objectives of the Project. A system alternative would make it unnecessary to construct all or part of the Project, although some modifications or additions to another existing pipeline system may be required to increase its capacity, or another entirely new system may need to be constructed. Such modifications or additions would result in environmental impact; however, the impact could be less than, similar to, or greater than that associated with construction of the Project.

3.3.1 Other Existing Pipeline Systems

Natural gas pipeline systems in the Project area are operating at or near capacity during peak heating and cooling periods. Thus, any other system in the region would require modification or expansion similar to the Project to transport the volume of natural gas proposed by Transco. Because the Project would largely involve pipeline looping and modification of existing facilities, the modification or expansion of another existing system would likely result in similar or greater environmental impact than Transco's proposal. Therefore, we did not evaluate the expansion of another existing pipeline system to meet the Project objectives.

3.3.2 Transco System Alternatives

During Project development and in response to public comments, Transco considered two alternative designs on its existing system that could potentially meet the Project objectives. These design alternatives include replacing existing pipeline segments with larger diameter pipeline and increasing the MAOP of additional pipeline segments to avoid construction of the proposed looping segments. We independently reviewed and analyzed the system alternatives as discussed below.

Pipeline Replacement Alternative

The Princeton Ridge Coalition questioned whether Transco's existing capacity and the incremental Project capacity could be accommodated by replacing an existing pipeline segment with a larger diameter pipeline, thus avoiding the right-of-way expansion associated with the proposed loops. As indicated on Transco's alignment sheets, the Project loops would typically

require from 0 to 25 feet of new operational right-of-way depending on the degree to which the new loops would be installed within or adjacent to Transco's existing right-of-way. Some commentors also suggested that Transco replace older, existing pipelines in conjunction with installation of the proposed loops due to concerns that the older pipelines may represent a public safety hazard.

Transco estimates that replacing an existing line with a new, larger pipeline that could potentially transmit the existing and proposed capacity would require service outages of 6 to 8 months, during which a substitute supply would be unavailable. Taking one pipeline out of service for an extended period of time would also adversely affect Transco's ability to transport gas on the Leidy system for injection storage and subsequent withdrawal during peak demand periods. Implementation of the Pipeline Replacement Alternative for the Skillman Loop would have a particularly adverse effect on Transco's ability to meet current customer needs because Transco operates only one pipeline through this area. Regarding the safety of existing facilities, Transco is required to operate, monitor, and maintain existing facilities in accordance with PHMSA regulations, which are protective of public safety (see section 2.9.1). In addition, as discussed in sections 1.6.2 and 2.9.1, Transco would implement special construction methods to protect existing pipeline facilities from damage during construction, and we find these plans acceptable. For these reasons we conclude that replacement of Transco's existing pipeline(s) either with a larger diameter pipeline to transmit both the existing and proposed capacity, or as part of the installation of two new pipelines, is not a reasonable alternative to Transco's proposal.

Increased MAOP Alternative

Increasing the MAOP of Transco's existing system instead of constructing the proposed loops was considered, but Transco stated that the existing pipelines in the area where the loops would be located are currently operating at a pressure commensurate with their class locations. Therefore, the operating pressure in these segments could not be increased without replacing the pipelines (according to PHMSA requirements), which we discussed in the preceding section. In addition, implementation of the Increased MAOP Alternative would require increased horsepower at existing compressor stations, resulting in greater fuel use and air emissions. For these reasons we conclude that the Increased MAOP Alternative does not offer a significant environmental advantage over the Project.

3.4 ROUTE ALTERNATIVES

A route alternative deviates from a proposed pipeline alignment for a substantial length and distance in an effort to reduce overall environmental impacts. As discussed in section 1.6.2 and elsewhere in this EA, we received a substantial number of comments concerning environmental impacts that construction and operation of the Skillman Loop could have on the area referred to as the Princeton Ridge in northern Mercer County, New Jersey. As proposed, the Skillman Loop would cross the Princeton Ridge for 1.3 miles (21 percent) of the 6.2-mile-long proposed loop length. Of this 1.3-mile-long segment, 0.5 mile is within land designated by the State of New Jersey as ESA 5 and 0.8 mile is within land designated as F3 (see section 2.4.5). The Skillman Loop would parallel Transco's existing Caldwell Loop B line, the only pipeline located in the right-of-way.

In response to comments and as discussed below, we considered three route alternatives to Transco's proposed alignment for the Skillman Loop.

3.4.1 Skillman Alternative

Transco developed the Skillman Alternative, which begins at the same location as the proposed Skillman Loop at MP 1776.8 on Transco's Mainline system (see figure 3.4-1). The Skillman Alternative then extends northeasterly parallel to the Mainline system for approximately 6.0 miles before departing from the Mainline system in a northwesterly direction for 6.4 miles, where it joins the existing Caldwell Loop B line at MP 1782.5, and then parallels the Caldwell Loop B line for 0.5 mile to the termination of the proposed Skillman Loop at MP 1783.0.

The primary advantage of the Skillman Alternative is that it avoids ESA 5-designated lands. However, the Skillman Alternative is 12.3 miles long, or nearly twice as long as the Skillman Loop, and would include 6.4 miles of greenfield construction. Because the lengths of the Skillman Loop (6.2 miles) and the segment of the Skillman Alternative where it would be collocated with Transco's Mainline system (6.0 miles) are similar, the primary difference in land requirements between the Skillman Loop and the Skillman Alternative are in the 6.4-mile-long greenfield segment of the Skillman Alternative. Assuming a typical construction right-of-way width of 105 feet and a typical operational right-of-way width of 50 feet for the greenfield segment, the Skillman Alternative would impact approximately 81 acres more land during construction and require approximately 39 acres more land for operation than the Skillman Loop. Implementation of the Skillman Alternative would result in increased environmental impacts commensurate with the substantially greater land use requirements for the alternative. The greenfield segment of the Skillman Alternative would also place a 50-foot-wide operational easement on properties not currently affected by a pipeline, whereas the Skillman Loop would involve incremental expansion of an existing easement. For these reasons, we conclude that the Skillman Alternative does not offer a significant environmental advantage over the Skillman Loop.

3.4.2 Princeton Ridge Coalition Alternatives

The Princeton Ridge Coalition proposed two route alternatives for the Skillman Loop, referred to as Princeton Ridge Coalition Alternative 1 (PRC-1) and Princeton Ridge Coalition Alternative 2 (PRC-2). These route alternatives are discussed below and are depicted on figure 3.4-1. For our analysis of the alternatives, we assumed a typical construction right-of-way width of 50 feet in ESA 5 and F3-designated areas (as proposed by Transco in the Princeton Ridge area); 105 feet in remaining uplands; and 75 feet in remaining wetlands. Due to greenfield routing, we also assumed a 50-foot-wide operational right-of-way for the entire length of the alternatives. Our independent analysis of the Skillman Loop assumed a typical construction right-of-way width of 50 feet in ESA 5 and F3-designated land in the Princeton Ridge; 105 feet in remaining uplands; and 75 feet in remaining wetlands. Due to collocation with Transco's existing easement, we assumed an incremental 20-foot-wide operational right-of-way for the entire length of the Skillman Loop except for the segment between approximate MPs 1778.9 to 1779.9 where the pipeline would be installed by HDD.

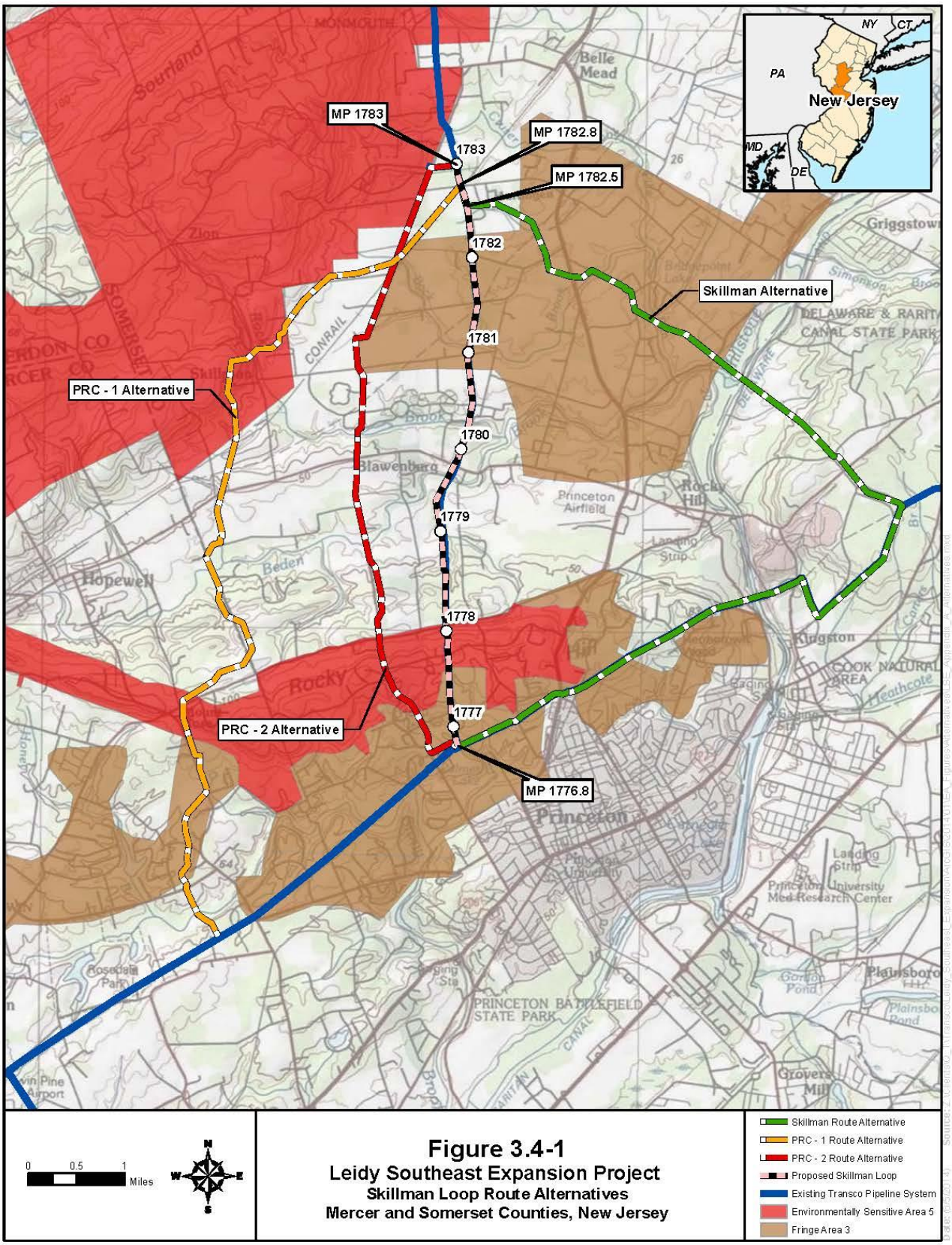

Figure 3.4-1
Leidy Southeast Expansion Project
Skillman Loop Route Alternatives
Mercer and Somerset Counties, New Jersey

Princeton Ridge Coalition Alternative 1

Referring to figure 3.4.-1, PRC-1 begins on Transco's existing Mainline system approximately 3 miles southwest from the beginning of the Skillman Loop. PRC-1 then follows a winding route generally to the north and northeast before connecting with Transco's existing right-of-way near MP 1782.8 of the Caldwell Loop B line, and is then collocated with Transco's right-of-way to the termination of the Skillman Loop at MP 1783.

As indicated in table 3.4.2-1, PRC-1 is 10.2 miles long, or 3.8 miles (60 percent) longer than the Skillman Loop. PRC-1 would be collocated with existing linear infrastructure (roads and railroads) for approximately 2 miles (20 percent) of its length, whereas the Skillman Loop would be collocated with the Caldwell Loop B right-of-way for approximately 5.5 miles (86 percent) of its length.

Due to its added length, construction of the alternative would impact approximately 45.6 acres more land than the Skillman Loop. As a greenfield facility, operation of the alternative would establish a 50-foot-wide permanent easement for 10.0 miles on lands not currently affected by a pipeline easement. In comparison, operation of the Skillman Loop would typically expand Transco's existing easement by 20 feet. As a result, operation of PRC-1 would impact 50.3 acres more land than the Skillman Loop.

Using USGS land cover data, construction of the Skillman Loop is estimated to impact 24.5 acres of forest, or 2.4 acres less forest than PRC-1. Due to the greenfield routing of PRC-1, operation of the alternative would permanently impact 13.1 acres more forest than the Skillman Loop. The Princeton Ridge Coalition considered the size of forested areas crossed and estimates that the Skillman Loop would impact 7.8 acres of mature, contiguous forest whereas PRC-1 would impact 1.4 acres of similar forest.

Utilizing NJDEP digital wetland data, construction of the Skillman Loop and PRC-1 would essentially impact the same amount of wetland, but due to greenfield routing, operation of PRC-1 would impact 3.2 acres more wetland than the Skillman Loop. In its assessment of wetlands, the Princeton Ridge Coalition concluded that the Skillman Loop would impact approximately 10.7 acres more wetlands than PRC-1, although the process by which the Princeton Ridge Coalition estimated wetland impacts was not specified. The Skillman Loop would require 13 waterbody crossings, or 4 fewer waterbody crossings than PRC-1.

TABLE 3.4.2-1

Comparison of the Skillman Loop to Princeton Ridge Coalition Alternatives 1 and 2

Factor	Skillman Loop	PRC-1	PRC-2
Length (mi)	6.4	10.2	7.1
Collocation (percent)	86	20	86
Land Required			
Construction (acres) [a]	58.9	104.5	79.1
Operation (acres) [b]	12.8	63.1	43.2
Forest Land [c]			
Construction (acres) [a]	24.5	26.9	12.9
Operation (acres) [b]	5.6	18.7	7.1
Wetlands [d]			
Construction (acres) [a]	8.7	8.6	3.4
Operation (acres) [b]	2.4	5.6	1.2
Waterbody Crossings [e]			
Minor (no.)	2	5	5
Intermediate (no.)	11	4	4
Special Land Use			
USGS Protected Areas (mi)	2.0	1.4	1.1
NJDEP Natural Heritage Area	0.0	1.2	1.4
NJDEP Vernal Pool Habitat (mi)	1.2	0.0	0.3
New Jersey Environmental Planning Area			
ESA 5 (mi)	0.5	2.1	0.9
Construction (acres) [a]	3.0	12.7	5.5
Operation (acres) [b]	1.2	12.7	5.5
Fringe F3 (mi)	2.0	1.7	0.8
Construction (acres) [a]	22.5	10.1	4.7
Operation (acres) [b]	5.4	10.1	4.7
Conservation Easements			
New Jersey Farmland Protection Preservation (mi)	0.8	1.0	1.1
New Jersey Green Acres (mi)	1.8	1.4	0.5
NRCS Wetland Conservation Easement (mi)	0.0	0.6	0.0
Unknown Conservation Easement (mi)	0.0	0.8	0.0
Residences within 50 feet of Construction Right-of-Way (no.) [f]	8	1	23/22 [g]
Landowners (no.)	60	86	30
Road Crossings (no.) [f]	12	25	15

[a] Construction land requirements and impacts for the Skillman Loop were based on a 50-foot-wide right-of-way in ESA 5 and F3-designated land in the Princeton Ridge area; a 105-foot-wide right-of-way in remaining uplands; and a 75-foot-wide right-of-way in remaining wetlands. We included temporary workspace at the HDD entry point but considered construction land requirements between the drill entry and exit points to be negligible.
Construction land requirements and impacts for the Princeton Ridge Coalition route alternatives were based on a 50-foot-wide right-of-way in ESA 5 and F3-designated land; a 105-foot-wide right-of-way in remaining uplands; and a 75-foot-wide right-of-way in remaining wetlands.

[b] Operation land requirements and impacts for the Skillman Loop were based on an incremental 20-foot-wide expansion of the existing right-of-way along the entire length except for the segment between MPs 1778.9 to 1779.9 where the pipeline would be installed by HDD.
Operation land requirements and impacts for the Princeton Ridge Coalition route alternatives were based on a 50-foot-wide right-of-way along the entire length.

[c] Forest impacts calculated using the USGS National Land Cover Dataset (2006).

[d] Wetland impacts calculated using the NJDEP digital wetlands data.

[e] Waterbody crossings assessed using the USGS National Hydrography Dataset.

[f] Based on a review of aerial photographs.

[g] Number of homes that would be within 50 feet of the construction right-of-way if the alternative were installed on the east or west side of County Road 601, respectively.

Table 3.4.2-1 indicates various special land use designations that would be crossed by the Skillman Loop and PRC-1. The Skillman Loop would cross greater lengths of USGS Protected Areas and NJDEP Vernal Pool Habitat than PRC-1, although PRC-1 would cross a greater length of land designated as NJDEP Natural Heritage Area. Regarding environmental planning areas designated by the State of New Jersey, the Skillman Loop would cross 0.5 mile of ESA 5-designated land and 2.0 miles of less sensitive F3-designated land, whereas PRC-1 would cross 2.1 miles of ESA 5-designated land and 1.7 miles of F3-designated land. PRC-1 would avoid construction within ESA 5-designated land along Transco's existing right-of-way across the Princeton Ridge, but would cross a greater length of ESA 5-designated land at two other locations, including a 1.6-mile-long crossing within an area referred to as Sourland Mountain, which stakeholders identified as an important ecological area. Construction and operation of the Skillman Loop would impact 3.0 acres and 1.2 acres of ESA 5-designated land, respectively, whereas construction and operation of PRC-1 would impact 12.7 acres of ESA 5-designated land, as the 50-foot-wide construction and operational rights-of-way would overlap in these areas.

Table 3.4.2-1 indicates various conservation easements that would be crossed by the Skillman Loop and PRC-1. PRC-1 would cross greater lengths of land enrolled in the New Jersey Farmland Protection Preservation program, NRCS Wetland Conservation Easement, and other unidentified conservation easements; whereas the Skillman Loop would cross a greater length of land enrolled in the Green Acres program.

Regarding impacts on the human environment, the construction workspace for the Skillman Loop would be within 50 feet of eight homes as compared to one home within 50 feet of the construction workspace for PRC-1. However, due to its added length and setting, PRC-1 would impact 26 more landowners as indicated by parcel boundaries, and would cross 13 more roads.

Based on the predominantly greater land use requirements and environmental impacts due to the added length and greenfield routing of PRC-1, we conclude that PRC-1 does not offer a significant environmental advantage over the proposed Skillman Loop.

Princeton Ridge Coalition Alternative 2

PRC-2 begins at the starting location for the Skillman Loop at MP 1776.8 on Transco's Mainline system and parallels the Skillman Loop at an offset of 0.5 to 1.0 mile to the west to the termination of the Skillman Loop at MP 1783 (see figure 3.4-1). PRC-2 follows County Road 601/Great Road for the majority of its length.

As indicated in table 3.4.2-1, PRC-2 is 7.1 miles long, or 0.7 mile (11 percent) longer than the proposed Skillman Loop. PRC-2 would be collocated with existing linear infrastructure for approximately 6.1 miles (86 percent) of its length; the Skillman Loop would also be collocated with the Caldwell Loop B right-of-way for approximately 5.5 miles (86 percent) of its length.

Due to its added length, construction of the alternative would impact approximately 20.2 acres more land than would the Skillman Loop. Operation of the alternative would establish a

50-foot-wide permanent easement for its entire length on lands not currently affected by a pipeline easement. In comparison, operation of the Skillman Loop would typically expand Transco's existing easement by 20 feet. As a result, operation of PRC-2 would impact 30.4 acres more land than the Skillman Loop.

The Princeton Ridge Coalition considered the size of forested areas crossed and estimated that the Skillman Loop would impact 5 acres more of mature, contiguous forest than would PRC-2. Using USGS land cover data, construction of the Skillman Loop is estimated to impact 11.6 acres more forest than PRC-2. However, operation of the alternative would permanently impact 1.5 acres more forest than the Skillman Loop.

In its assessment of wetlands, the Princeton Ridge Coalition concluded that the Skillman Loop would impact approximately 5 acres more wetlands than PRC-1, although the process by which the Princeton Ridge Coalition estimated wetlands was not specified. Utilizing NJDEP digital wetland data, construction and operation of PRC-2 would impact 5.3 acres and 1.2 acre less wetland, respectively, than the Skillman Loop. The Skillman Loop would require four fewer waterbody crossings than PRC-2.

Table 3.4.2-1 indicates various special land use designations that would be crossed by the Skillman Loop and PRC-2. The Skillman Loop would cross greater lengths of USGS Protected Areas and NJDEP Vernal Pool Habitat than PRC-2, although PRC-2 would cross a greater length of land designated as NJDEP Natural Heritage Area. Regarding environmental planning areas, the Skillman Loop would cross 0.5 mile of ESA 5-designated land and 2.0 miles of less sensitive F3-designated land, whereas PRC-2 would cross 0.9 mile of ESA 5-designated land and 0.8 mile of F3-designated land. The PRC-2 crossing of ESA 5-designated land would also occur within the Princeton Ridge, approximately 0.5 mile to the west of the Skillman Loop crossing. Due to its added length and wider construction right-of-way, construction and operation of PRC-2 would impact 2.5 acres and 4.3 acres more of ESA 5-designated land, respectively, than would the Skillman Loop.

Table 3.4.2-1 indicates various conservation easements that would be crossed by the Skillman Loop and PRC-2. PRC-2 would cross greater lengths of land enrolled in the New Jersey Farmland Protection Preservation program, whereas the Skillman Loop would cross a greater length of land enrolled in the Green Acres program.

Regarding impacts on the human environment, the construction workspace for the Skillman Loop would be within 50 feet of 8 homes, whereas construction workspace for PRC-2 would be within 50 feet of 22 or 23 homes, depending on which side of County Road 601 the pipeline would be installed. PRC-2 would impact about 30 fewer landowners than the Skillman Loop. However, none of the landowners affected by PRC-2 are currently affected by a pipeline right-of-way, whereas the majority of landowners affected by the Skillman Loop would experience an incremental expansion of the existing right-of-way on their property. Depending on final routing, PRC-2 would cross approximately the same number of roads as the Skillman Loop.

In comments filed with the Commission on July 7, 2014, the Princeton Ridge Coalition indicated its preference for PRC-2 and restated its previous position that our alternatives review

should consider impacts on contiguous forest, rather than acres of forest removed. As detailed in this EA, Transco's proposal would largely limit construction across the Princeton Ridge to the existing right-of-way, thereby avoiding or substantially reducing impacts on surrounding wooded areas. The Princeton Ridge Coalition also expressed concern with some aspects of Transco's description of PRC-2, including routing assumptions made by Transco. As stated above, we independently analyzed Transco's proposed route and the Princeton Ridge Coalition alternatives, including routing considerations. For example, we assumed that PRC-2 could be routed along the east side of an existing railroad line near the northern end of the route, thereby avoiding construction within ESA 5-designated land on the west side of the railroad. We also considered routing relative to residences along PRC-2 and applied consistent assumptions regarding construction workspaces and operational rights-of-way to all of the alternatives considered.

Montgomery Township borders the Princeton Ridge and would be affected by Transco's proposed route and both of the Princeton Ridge Coalition alternatives. In comments filed with the Commission on July 16 and July 23, 2014, Montgomery Township expressed opposition to PRC-2 noting its deviation from Transco's existing right-of-way; impacts on Green Acres properties, ESA 5-designated land, and township-owned open spaces within Montgomery Township; impacts on wetlands and waterbodies in Montgomery Township; and impacts on approximately 35 property owners in Montgomery Township and other property owners in neighboring Hopewell Township who are not presently affected by a pipeline right-of-way and thus have not been directly involved in the environmental review and public commenting processes up to this point.

As noted in section 3.0, an alternative should not be a transference of impacts, but should provide a significant environmental advantage over a proposed route. Based on the greater construction and operational land use requirements, increased length in ESA 5-designated land, and close proximity to more homes, we conclude that PRC-2 does not offer a significant environmental advantage over the proposed Skillman Loop.

Princeton Ridge Coalition 2-Pipe Alternative

The Princeton Ridge Coalition also expressed concern that the existing pipeline may require significant repair or replacement in the foreseeable future and that future expansion of Transco's system in the Princeton Ridge area could occur. To address these concerns and as a variation to the route alternatives discussed above, the Princeton Ridge Coalition recommended an alternative that would include decommissioning the existing pipeline (allowing the existing right-of-way to return to pre-construction conditions) and installing two new pipelines along either PRC-1 or PRC-2 to accommodate Transco's current capacity and the new capacity provided by the Project, and to provide a new route for future expansion in the area.

As discussed above, we conclude that neither PRC-1 nor PRC-2 routes provide a significant environmental advantage over the proposed Skillman Loop. Furthermore, the construction and operation of two new pipelines along either PRC-1 or PRC-2 would require even greater construction right-of-way and result in a new 75-foot-wide operational right-of-way, including in other ESA 5-designated areas where no pipeline right-of-way currently exists. Regarding the potential for repair or replacement of the existing pipeline, as discussed in sections 1.3.2 and 2.9.1, Transco is required to operate, monitor, and maintain the existing Caldwell Loop

B line in accordance with PHMSA regulations, which are protective of public safety. Furthermore, we are not aware of any future plans to expand Transco's system in the vicinity of the Princeton Ridge, and any future expansion would be subject to environmental review and Commission approval. Thus, we conclude that abandonment of 6.2 miles of the existing Caldwell Loop B pipeline, together with the installation of two new pipelines along either PRC-1 or PRC-2, is not reasonable and does not offer a significant environmental advantage over the proposed Skillman Loop.

3.5 ROUTE VARIATIONS

Route variations are identified to reduce impact on specific localized resource issues such as residences, cultural resources sites, and biological resources. Because route variations are considered in response to specific, localized issues, they may not always clearly display an environmental advantage other than to reduce targeted impacts or address a landowner or agency concern.

3.5.1 Skillman Loop Variations

We considered six route variations along the Skillman Loop. These variations were considered by Transco as alternatives to the proposed route and/or raised by landowners, agencies, or other stakeholders.

Variation 1

Variation 1 would depart from Transco's existing right-of-way between MPs 1777.8 and 1778.1 to avoid multiple waterbody crossings between MPs 1777.8 and 1777.9. Variation 1 would avoid two crossovers of the existing pipeline, one of which has been designed to require 0.2 acre of extra workspace and the other which would occur on agricultural land. However, the variation would result in greater construction and operation land use requirements and establish a new and separate 50-foot-wide permanent easement in ESA 5-designated land in the Princeton Ridge area. Therefore, we conclude that Variation 1 does not offer a significant environmental advantage over the Skillman Loop adjacent to the existing pipeline.

Variations 2, 3, and 4

Variations 2, 3, and 4 are associated with construction near Cherry Run and Beden Brook between MPs 1778.9 and 1779.8, where Transco subsequently incorporated an HDD into the Project in response to comments from affected landowners and Montgomery Township (see section 1.6.2). The proposed HDD would reduce impacts on residences, wetlands, waterbodies, and forest resources when compared to any of the variations considered. Therefore, we conclude that the overland route variations in the Cherry Run – Beden Brook area do not offer a significant environmental advantage over Transco's proposed HDD.

Variation 5

Variation 5 would involve installing the Skillman Loop on the west side of the existing right-of-way between MPs 1780.1 and 1780.3, rather than the east side as proposed. Variation 5 would avoid two crossovers of the existing pipeline, one of which would occur in agricultural

land and the other which would occur in largely open land. However, Variation 5 would deviate from Transco's existing right-of-way to avoid a small bridge across Rock Brook, resulting in an expanded operational right-of-way as compared to the proposed alignment, and would cross Rock Brook at a point where two branches of the waterbody converge. We therefore conclude that Variation 5 does not offer a significant environmental advantage over the proposed alignment.

Variation 6

Variation 6 would involve installing the Skillman Loop on the west side of the existing right-of-way in a residential area between MPs 1781.5 and 1782.7, rather than the east side as proposed. In this area, Transco's existing pipeline crosses 17 residential properties, including 10 properties where the pipeline marks the boundary between properties. Five additional homes are in close proximity to the existing pipeline, but are not directly affected by the right-of-way. Based on review of alignments sheets and considering the current right-of-way, lot configurations, and home locations, Variation 6 would result in greater construction right-of-way and placement of the pipeline nearer to 14 of 22 homes, whereas the proposed route would result in greater construction right-of-way and placement of the pipeline nearer to 8 of 22 homes. Transco also noted that Variation 6 would be in conflict with an existing water line that extends along the west side of the existing pipeline easement. For the above reasons, we conclude that Variation 6 does not offer a significant environmental advantage over the proposed alignment through this area.

We received comments from two residential landowners in this area. E. Youseff was concerned that construction of the Skillman Loop would require use of his property; however, the proposed alignment along the east side of Transco's existing right-of-way would not impact Mr. Youseff's property. During pre-filing, Transco considered Variation 6, which would have placed the new pipeline approximately 35 feet from the residence of R. Jerzewski, who was concerned about construction and other impacts on his property by this alignment. Mr. Jerzewski suggested a route variation that would follow nearby East Street. This alternative would avoid Mr. Jerzewski's property but would impact other residential property and wooded land, and would establish a new, 50-foot-wide operational easement on properties currently unaffected by a pipeline. For these reasons, we conclude that the alignment suggested by Mr. Jerzewski does not offer a significant environmental advantage over the proposed alignment. Further, Transco's final proposed route would place the new pipeline on the opposite side of the existing right-of-way from Mr. Jerzewski's property, and would require only a small area of ATWS on his property, which would be restored after construction.

3.5.2 Pleasant Run Loop Variations

We considered two variations on the Pleasant Run Loop. These variations were considered by Transco as alternatives to the proposed route and/or raised by landowners, agencies, or other stakeholders.

Variation 1

Variation 1 would extend along the north side of Transco's existing right-of-way between MPs 1.0 and 2.9, rather than the south side of the right-of-way as proposed. Within this segment,

the proposed alignment would deviate from the existing right-of-way between MPs 1.0 and 1.3 to avoid electric power line transmission towers and would reduce impacts on forest land by constructing within agricultural land. Impacts on wetlands and forested areas would be similar over the length of Variation 1 and the proposed alignment, but Variation 1 would result in construction workspace within 50 feet of four more residences. We conclude that Variation 1 does not offer a significant environmental advantage over Transco's proposed alignment.

Variation 2

Variation 2 would extend along the north side of Transco's existing right-of-way between MPs 5.3 and 5.7, rather than the south side of the right-of-way as proposed. The proposed alignment would require two crossovers of the existing right-of-way, which would occur in agricultural land, but would reduce impacts on a small stream and associated wetlands that would be more closely paralleled by Variation 2. We conclude that Variation 2 does not offer a significant environmental advantage over the proposed alignment.

3.5.3 Franklin Loop Variations

Transco identified several alternatives to the Franklin Loop. However, we eliminated these alternatives for the following reasons:

- they would require greenfield construction and impact additional landowners and environmental resources;
- they were very minor reroutes that provided no significant environmental benefit; and/or
- they involved transferring impacts (crossovers), with no appreciable environmental benefits.

We evaluated two variations on the Franklin Loop.

Variation 1

Transco's existing right-of-way in the vicinity of Variation 1 includes three existing pipelines, Leidy Lines A, B, and C. In general, where homes have been constructed in close proximity to the right-of-way, Transco would install the Franklin Loop between existing pipelines using the construction methods described in section 1.6.2. In areas where numerous homes are not located adjacent to the right-of-way, Transco would install the Franklin Loop outside and adjacent to the existing right-of-way.

Variation 1 would begin near MP 61.9, at which point the proposed alignment would be located outside and adjacent to the eastern boundary of Transco's existing right-of-way. Rather than crossing over and entering the existing right-of-way at this location as proposed, Variation 1 would continue adjacent to the eastern outside edge of the right-of-way to approximate MP 62.2, at which point the pipeline would crossover to the west side of Transco's right-of-way, and then continue to MP 63.1 where the variation would again crossover Transco's right-of-way, connecting with the proposed alignment adjacent to the east side of the right-of-way.

Based on review of alignment sheets, construction of Variation 1 on the outside of the existing right-of-way between MPs 61.9 and 62.6 would substantially increase construction-related impacts on numerous adjacent residential properties, and would result in an incremental expansion of the existing operational right-of-way on those properties when compared to the proposed alignment between existing pipelines. Between MP 62.6 and 63.1, Variation 1 would be located on the west side of the existing right-of-way, whereas the proposed alignment would be on the east side of the right-of-way. Based on information from Transco and our review of alignment sheets, construction and operational land requirements and associated environmental impacts would be similar between Variation 1 and the proposed route over the referenced segment. Therefore, due to reduced construction and operation impacts on residences between MPs 61.9 and 62.6, and similar impacts over the remainder of the comparative routes, we conclude that Variation 1 does not offer a significant environmental advantage over Transco's proposed installation of the Franklin Loop through this area.

Variation 2

Variation 2 would place the Franklin Loop on the west side of Transco's existing right-of-way between MPs 64.1 and 68.1, rather than on the east side of the right-of-way as proposed. Based on information from Transco and review of alignment sheets, construction and operation land use requirements would be similar for either route. Construction of the proposed route would impact about 1.5 acres more of forest whereas construction of Variation 2 would impact about 1.5 acres more wetland. The proposed alignment would require three fewer waterbody crossings and would cross two fewer designated recreational/special interest areas. Both routes would cross the Lehigh River at approximately the same location. Based on the above information, we conclude that Variation 2 would not provide a substantial environmental advantage over Transco's proposed route.

We received comments from J. Beardsley-Humphreys, whose property near MP 65.3 on the east bank of the Lehigh River would be affected by the proposed alignment along the west side of Transco's existing right-of-way, or by an alternative alignment on the east side of the right-of-way. At this location, Transco's right-of-way contains three existing pipelines: Leidy Lines A, B, and C. Ms. Beardsley-Humphreys expressed concerns about proposed construction which would approach to approximately 30 feet from her home, effects on horses kept at the property, the loss of trees, impacts on wildlife, and impacts on the potential development of her property with cabins and a recreational vehicle park. Ms. Beardsley-Humphreys and Transco have discussed compensation for Project-related impacts on her property but have not come to agreement.

Based on our review of alignment sheets, the construction and operational land use requirements and impacts on wooded areas of Ms. Beardsley-Humphreys' property would be similar for an alignment on either side of the existing right-of-way. Ms. Beardsley-Humphreys would prefer that Transco install the pipeline on the east side of her property, but to do so would require two crossovers of the existing right-of-way, which would require increased workspace, including on the property on the west side of the Lehigh River. We therefore conclude that an alignment of the Franklin Loop along the east side of Transco's existing right-of-way would not be environmentally superior to the proposed alignment on Ms. Beardsley-Humphreys' property. However, **we recommend that:**

- **<u>Prior to construction</u>, Transco should file a finalized site-specific construction/crossing plan for the Beardsley-Humphreys property with the Secretary for review and written approval by the Director of OEP.**

3.6 ALTERNATIVE CONSTRUCTION METHODS

Transco proposes to implement a wet open cut method to install the Franklin Loop across the Lehigh River and Tobyhanna Creek in Monroe County, Pennsylvania. As discussed in section 2.2.2, we considered alternative drilling and dry crossing methods to cross these waterbodies, but determined that the alternative construction methods were either infeasible or did not offer a significant environmental advantage over Transco's proposed method.

At the request of the Princeton Ridge Coalition, Transco considered the potential of implementing an HDD to avoid the proposed overland construction of the Skillman Loop in the Princeton Ridge. Transco engaged Laney Directional Drilling Company to evaluate the feasibility of the HDD. This company previously completed the longest known HDD installation of 42-inch-diameter pipeline in the world at 6,770 feet; the HDD was installed in soft soils and took 60 days to complete. The Princeton Ridge HDD, however, would be 7,140 feet long through bedrock and would take approximately 240 days to complete. When installing a pipeline segment by HDD, the risk of failure increases if the entire HDD segment cannot be pulled through the borehole in a continuous action. Transco raised concern about the ability to complete the Princeton Ridge HDD pullback in a continuous action due to the unprecedented length of the HDD and weight of the pipeline segment.

Whereas an HDD through the Princeton Ridge would avoid the environmental impacts associated with overland pipeline construction, due primarily to the unprecedented length of the HDD, hard rock drilling conditions, lengthy duration of the drill, and concerns with the ability to pull the HDD segment back in a single action, we conclude that the risks associated with the Princeton Ridge HDD indicate a high likelihood of failure. Therefore, we do not recommend its adoption. We also note that Transco would limit the construction right-of-way to 50 feet through the majority of the Princeton Ridge, which the Princeton Ridge Coalition has stated addresses many of their environmental concerns. Transco has also developed site-specific construction and restoration plans for the Princeton Ridge area and, as discussed in this EA, we find these plans acceptable.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the analysis in this EA, we have determined that if Transco constructs and operates the proposed facilities in accordance with its application, supplements, and staff's mitigation measures below, approval of this Project would not constitute a major federal action significantly affecting the quality of the human environment.

We recommend that the Commission Order contain a finding of no significant impacts and include the measures listed below as conditions in any authorization the Commission may issue to Transco.

1. Transco shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Transco must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;

    b. justify each modification relative to site-specific conditions;

    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and

    d. receive approval in writing from the Director of OEP **before using that modification**.

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:

    a. the modification of conditions of the Order; and

    b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from Project construction and operation.

3. **Prior to any construction**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets and drawings. **As soon as they are available, and before the start of construction**, Transco shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the

Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

Transco's exercise of eminent domain authority granted under NGA Section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Transco's right of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Transco shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area**.

   This requirement does not apply to extra workspace allowed by Transco's Plan and/or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;

   b. implementation of endangered, threatened, or special concern species mitigation measures;

   c. recommendations by state regulatory authorities; and

   d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the authorization and before construction begins**, Transco shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Transco must file revisions to the plan as schedules change. The plan shall identify:

   a. how Transco will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;

b. how Transco will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;

c. the number of EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;

d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;

e. the location and dates of the environmental compliance training and instructions Transco will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change), with the opportunity for OEP staff to participate in the training session(s);

f. the company personnel (if known) and specific portion of Transco's organization having responsibility for compliance;

g. the procedures (including use of contract penalties) Transco will follow if noncompliance occurs; and

h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

i. the completion of all required surveys and reports;
ii. the environmental compliance training of onsite personnel;
iii. the start of construction; and
iv. the start and completion of restoration.

7. Transco shall employ at least one EI per construction spread. The EIs shall be:

a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;

b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;

c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;

d. a full-time position, separate from all other activity inspectors;

e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and

f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Transco shall file updated status reports with the Secretary on a **biweekly** basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

   a. an update on Transco's efforts to obtain the necessary federal authorizations;

   b. the construction status of the Project, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally-sensitive areas;

   c. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);

   d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;

   e. the effectiveness of all corrective actions implemented;

   f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and

   g. copies of any correspondence received by Transco from other federal, state, or local permitting agencies concerning instances of noncompliance, and Transco's response.

9. **Prior to receiving written authorization from the Director of OEP to commence construction of any project facilities**, Transco shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. Transco must receive written authorization from the Director of OEP **before placing the Project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official:

   a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or

b. identifying which of the conditions in the Order Transco has complied with or will comply with. This statement shall also identify any areas affected by the project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. **Prior to construction**, Transco shall revise its procedures consistent with the FERC staff's Procedures at section V.B.4.a.

13. **Prior to construction**, Transco shall file with the Secretary, for review and written approval by the Director of OEP, a complete list of areas by milepost where Transco would place spoil within 10 feet from the edge of a waterbody and site-specific justification for each location.

14. Transco shall not begin construction of the Project **until**:

a. Transco files the final Migratory Bird Habitat Restoration Plan with the New Jersey and Pennsylvania Field Offices of the FWS and the Secretary; and

b. Transco files with the Secretary all FWS comments on the final Migratory Bird Habitat Restoration Plan.

15. Transco **shall not begin construction of the Project until**:

a. Transco files:

i. the results of the Phase II and Phase III bog turtle survey with the Pennsylvania Field Office of the FWS and the Secretary; and

ii. the final Indiana Bat Conservation Plan with the New Jersey and Pennsylvania Field Offices of the FWS and the Secretary;

b. the FERC staff completes any necessary Section 7 ESA consultation with the FWS for the bog turtle and Indiana bat;

c. the FERC staff completes any necessary Section 7 ESA conference with the FWS regarding the northern long-eared bat and any subsequent consultation, if necessary; and

d. Transco receives written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.

16. Transco shall not begin offsite mitigation activities in New Jersey or Pennsylvania **until**:

a. Transco files the results of the Phase II bog turtle survey at the proposed wetland mitigation site in Lehigh County with the Pennsylvania Field Office of the FWS and the Secretary;

b. Transco reviews any proposed wetland mitigation sites in New Jersey for federally listed threatened and endangered species and, if necessary, conducts surveys for identified species in accordance with FWS requirements, and files the results of these reviews and surveys with the New Jersey Field Office of the FWS and the Secretary; and

c. the FERC staff completes any necessary Section 7 ESA consultation with the FWS.

17. **Prior to construction**, Transco shall file with the Secretary any outstanding survey results for state-listed species and identify any additional mitigation measures developed in consultation with the applicable state agencies.

18. **Prior to construction of the Skillman and Pleasant Run Loops**, Transco shall file with the Secretary an updated status of its consultation with the NJDEP to construct and operate its pipeline and associated facilities within Green Acres Program properties. Transco shall include copies of all correspondence, including any additional requirements imposed by the NJDEP.

19. **Prior to construction**, Transco shall file with the Secretary a copy of the determination of consistency with the Coastal Zone Management Programs of the VDEQ, and the Chesapeake Bay and Coastal Programs of the MDNR.

20. Transco shall not begin construction of facilities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

a. Transco files with the Secretary:

i. Phase I cultural resources survey and architectural inventory reports for any previously unreported areas, including any wetland mitigation parcels, and the appropriate SHPO's comments on the reports;

ii. the Revised Phase I report for New Jersey, and the SHPO's comments on the report;

iii. the Virginia SHPO's comments on facility modifications that were excluded from cultural resources surveys;

b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

c. the FERC staff reviews and the Director of OEP approves the cultural resources reports, and notifies Transco in writing that construction may proceed.

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CONTAINS PRIVILEGED INFORMATION--DO NOT RELEASE."**

21. Transco shall file **in the construction status reports** the following information for each HDD entry and exit site:

    a. noise measurements from the nearest NSA, obtained at the start of drilling operations;

    b. noise mitigation that Transco implemented at the start of drilling operations; and

    c. any additional mitigation measures that Transco will implement if the initial noise measurements exceeded an L_{dn} of 55 dBA at the nearest NSA and/or increased noise is 10 dB over ambient conditions.

22. Transco shall file a noise survey with the Secretary **no later than 60 days** after placing the modified equipment at Compressor Stations 205 and 517 into service. If full load condition noise surveys are not possible, Transco shall provide interim surveys at the maximum possible horsepower load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at Compressor Stations 205 and 517 under interim or full horsepower load exceeds an L_{dn} of 55 dBA at the nearest NSA, Transco shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Transco shall confirm compliance with the above requirement by filing a second noise survey for each station with the Secretary **no later than 60 days** after it installs the additional noise controls.

23. Transco shall make all reasonable efforts to ensure its predicted noise levels from Compressor Stations 515 and 520 are not exceeded at nearby NSAs and file noise surveys showing this with the Secretary **no later than 60 days** after placing Compressor Stations 515 and 520 into service. If a full load condition noise survey is not possible, Transco shall provide interim surveys at the maximum possible horsepower load and provide the full load surveys **within 6 months**. If the noise attributable to the operation of all of the equipment at Compressor Stations 515 and 520 under interim or full horsepower load conditions exceeds the existing noise levels at any nearby NSAs, Transco shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Transco shall confirm compliance with the above requirement by filing a second noise survey for each station with the Secretary **no later than 60 days** after it installs the additional noise controls.

24. **Prior to construction of the Skillman Loop**, Transco shall file with the Secretary for review and approval by the Director of OEP the specific measures that it will implement between MPs 1776.8 and 1778.1 to monitor and maintain the proposed air gap over the existing pipeline, including areas of highly saturated soil conditions.

25. **Prior to construction**, Transco shall file a finalized site-specific construction/crossing plan for the Beardsley-Humphreys property with the Secretary for review and written approval by the Director of OEP.

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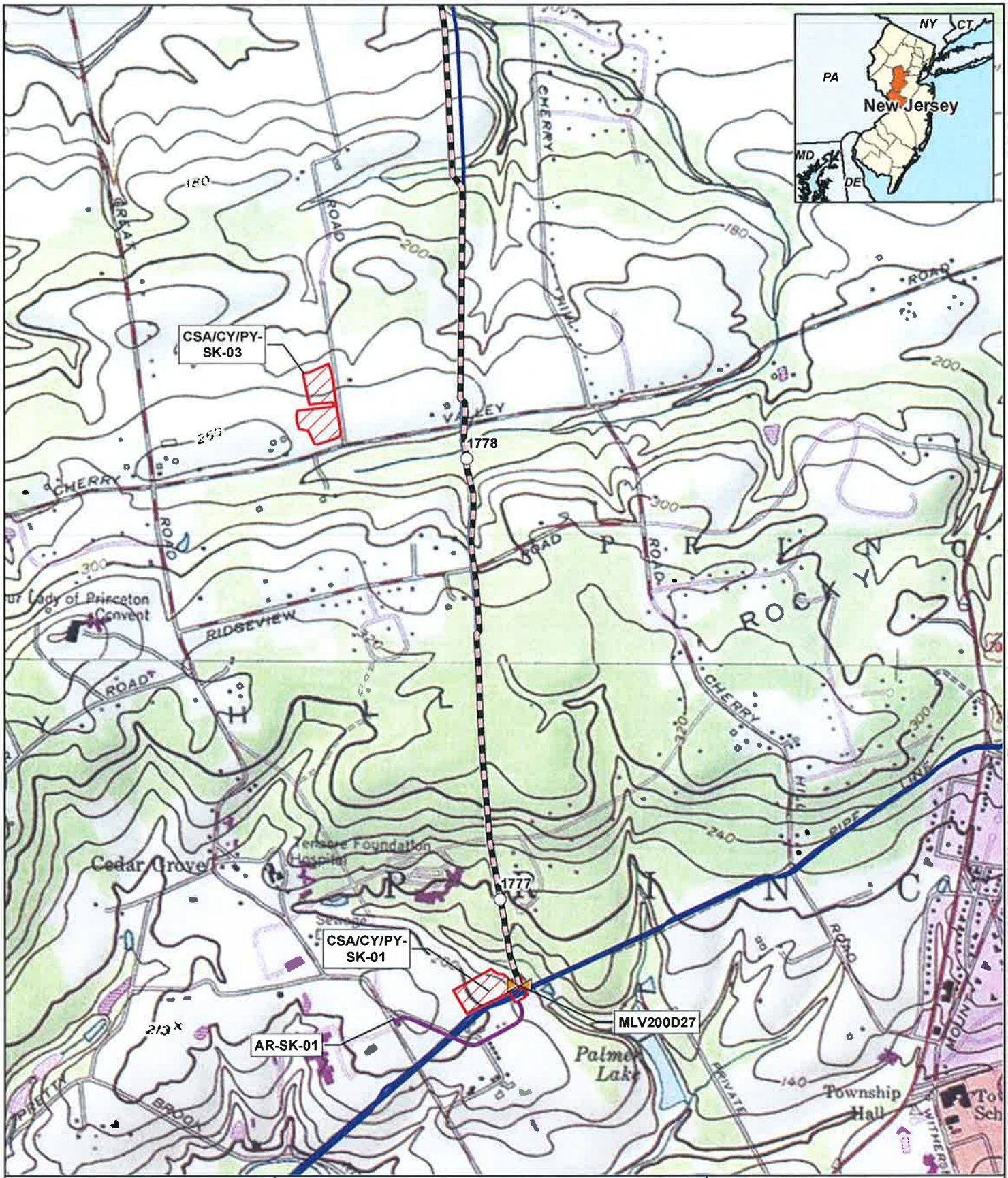
APPENDIX A

PROJECT MAPS



0 750 1,500 Feet

1 inch = 1,500 feet

N W E S

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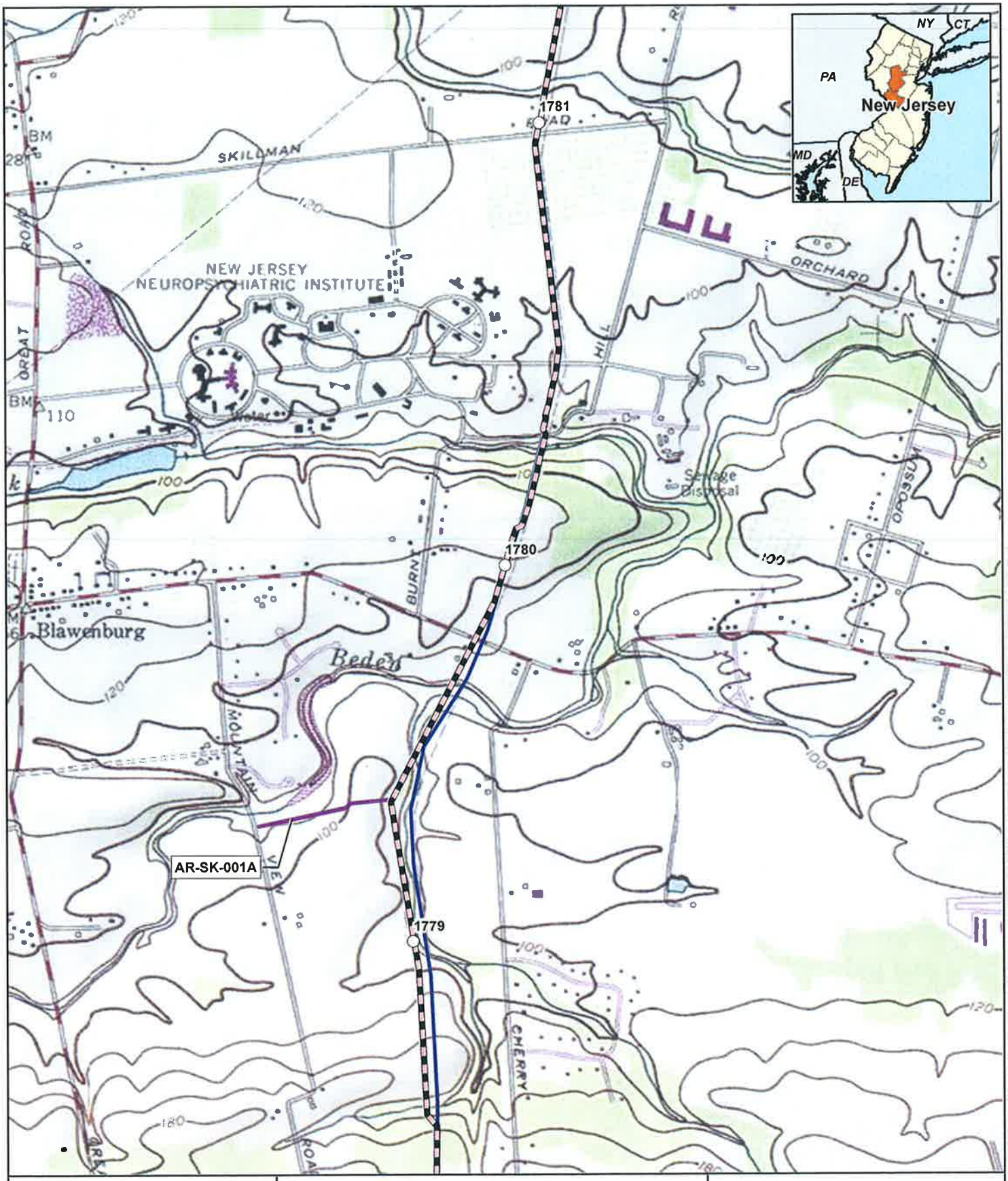
Appendix A

Leidy Southeast Expansion Project

Skillman Loop

Mercer and Somerset Counties, New Jersey

- Existing Transco Pipeline System
- Proposed Skillman Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road



Appendix A

Leidy Southeast Expansion Project

Skillman Loop

Mercer and Somerset Counties, New Jersey

Existing Transco Pipeline System

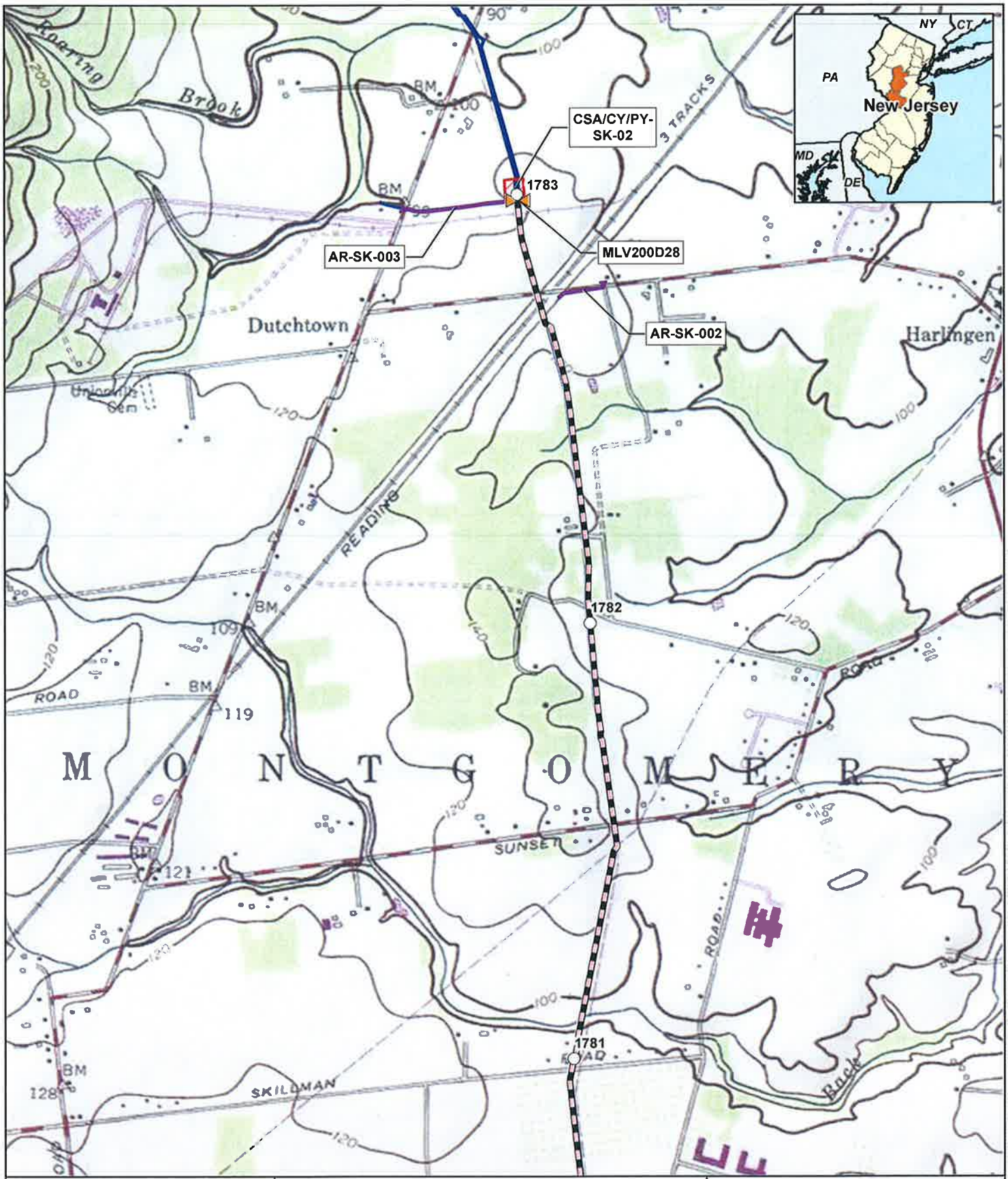
Proposed Skillman Loop

Proposed Pipe/Contractor Storage Yard

Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed

Proposed Access Road

Page 2 of 3



Appendix A

Leidy Southeast Expansion Project

Skillman Loop

Mercer and Somerset Counties, New Jersey

- Existing Transco Pipeline System
- Proposed Skillman Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road

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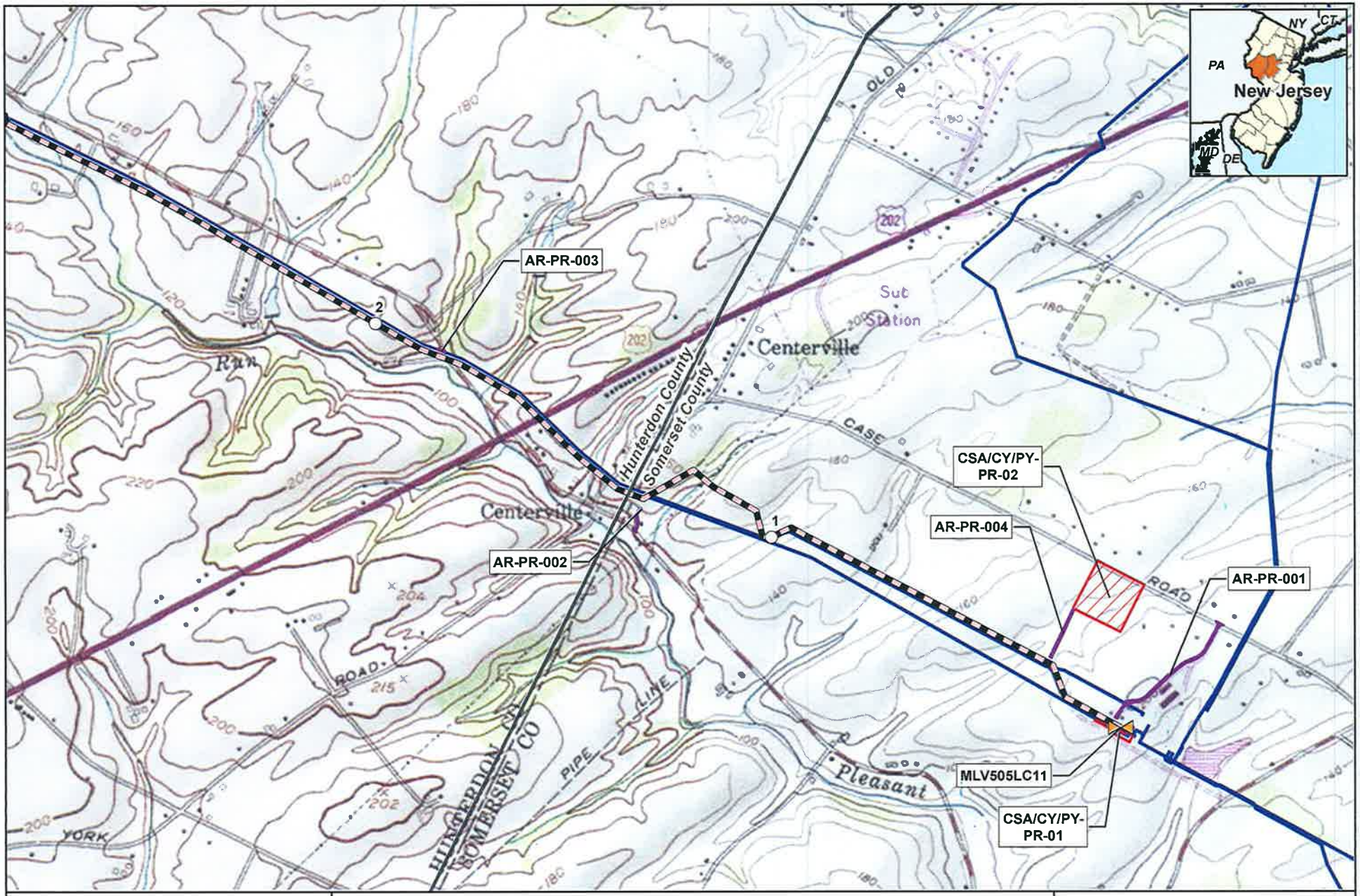

0 750 1,500 Feet

1 inch = 1,500 feet

N W E S

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Appendix A

Leidy Southeast Expansion Project

Pleasant Run Loop

Hunterdon and Somerset Counties, New Jersey

- Existing Transco Pipeline System
- Proposed Pleasant Run Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road

0 750 1,500 Feet

1 inch = 1,500 feet

N W E S

Page 2 of 3

Appendix A
Leidy Southeast Expansion Project
Pleasant Run Loop
Hunterdon and Somerset Counties, New Jersey

- Existing Transco Pipeline System
- Proposed Pleasant Run Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road

Appendix A
Leidy Southeast Expansion Project
Pleasant Run Loop
Hunterdon and Somerset Counties, New Jersey

Page 3 of 3

0 750 1,500 Feet

1 inch = 1,500 feet

N W E S

Page 1 of 5

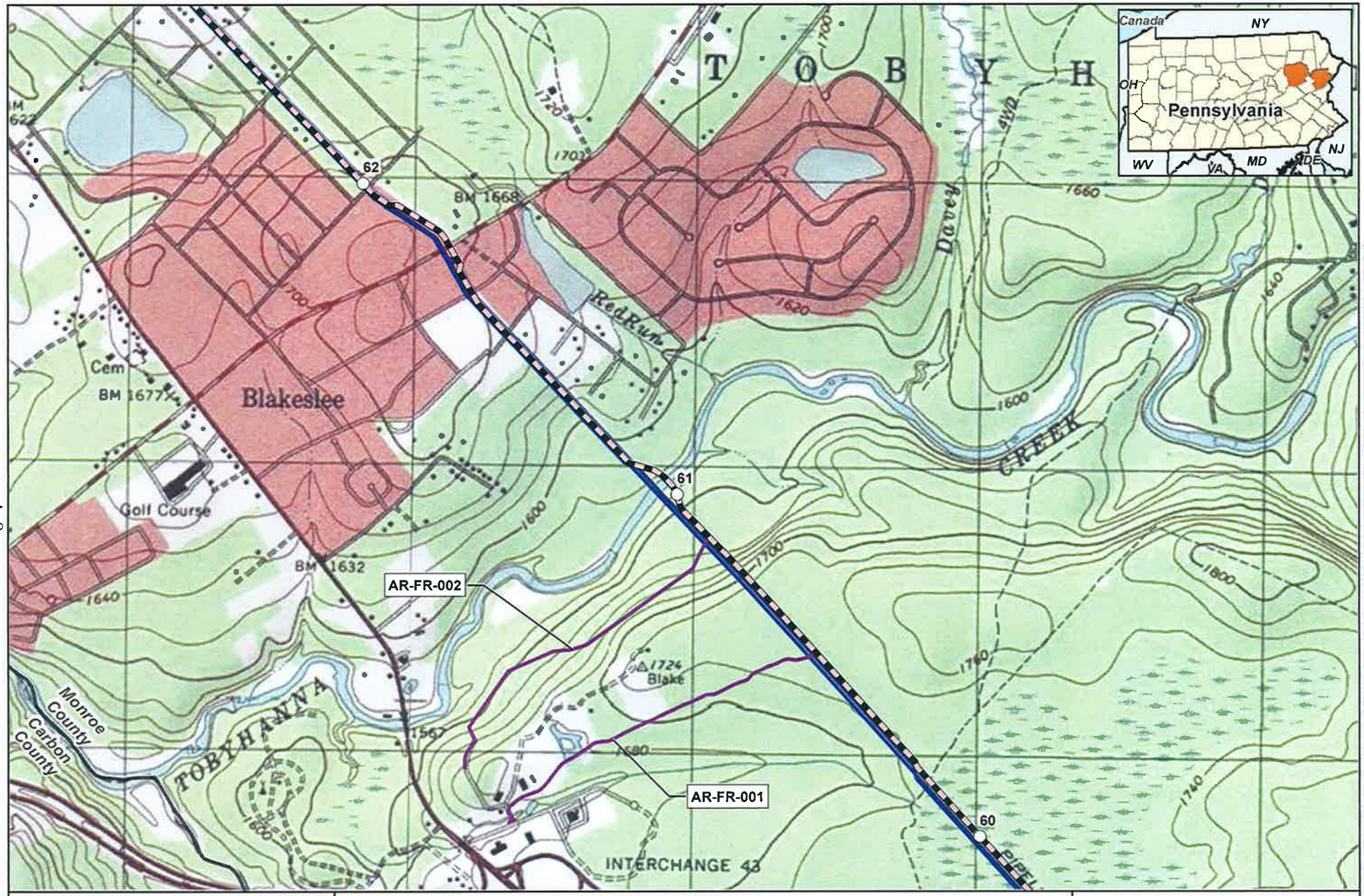
Appendix A

Leidy Southeast Expansion Project

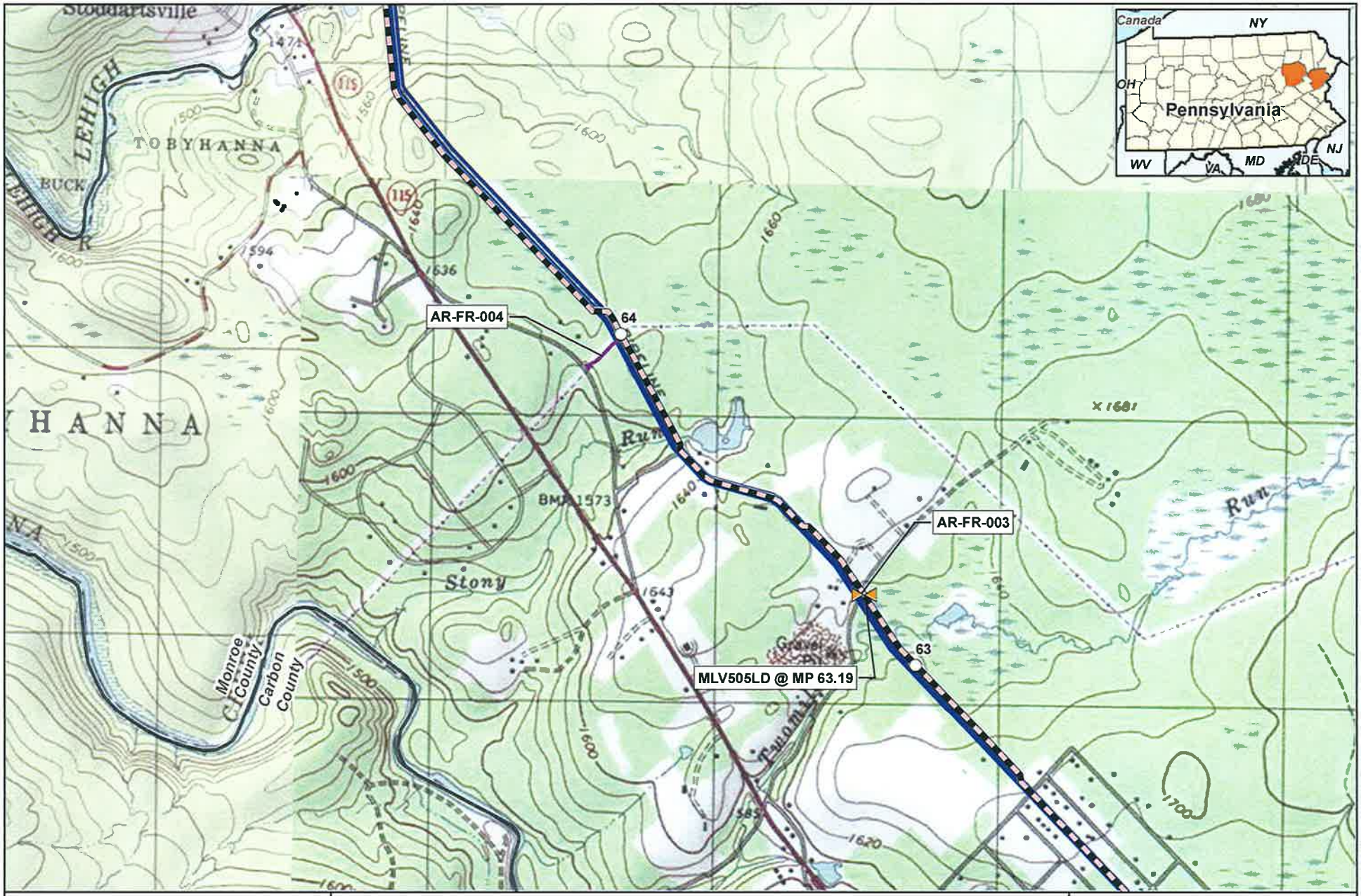
Franklin Loop

Luzerne and Monroe Counties, Pennsylvania

- Existing Transco Pipeline System
- Proposed Franklin Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road



Appendix A
Leidy Southeast Expansion Project
Franklin Loop
Luzerne and Monroe Counties, Pennsylvania



0 750 1,500 Feet

1 inch = 1,500 feet

N W E S

Page 3 of 5

Appendix A

Leidy Southeast Expansion Project

Franklin Loop

Luzerne and Monroe Counties, Pennsylvania

- Existing Transco Pipeline System
- Proposed Franklin Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road

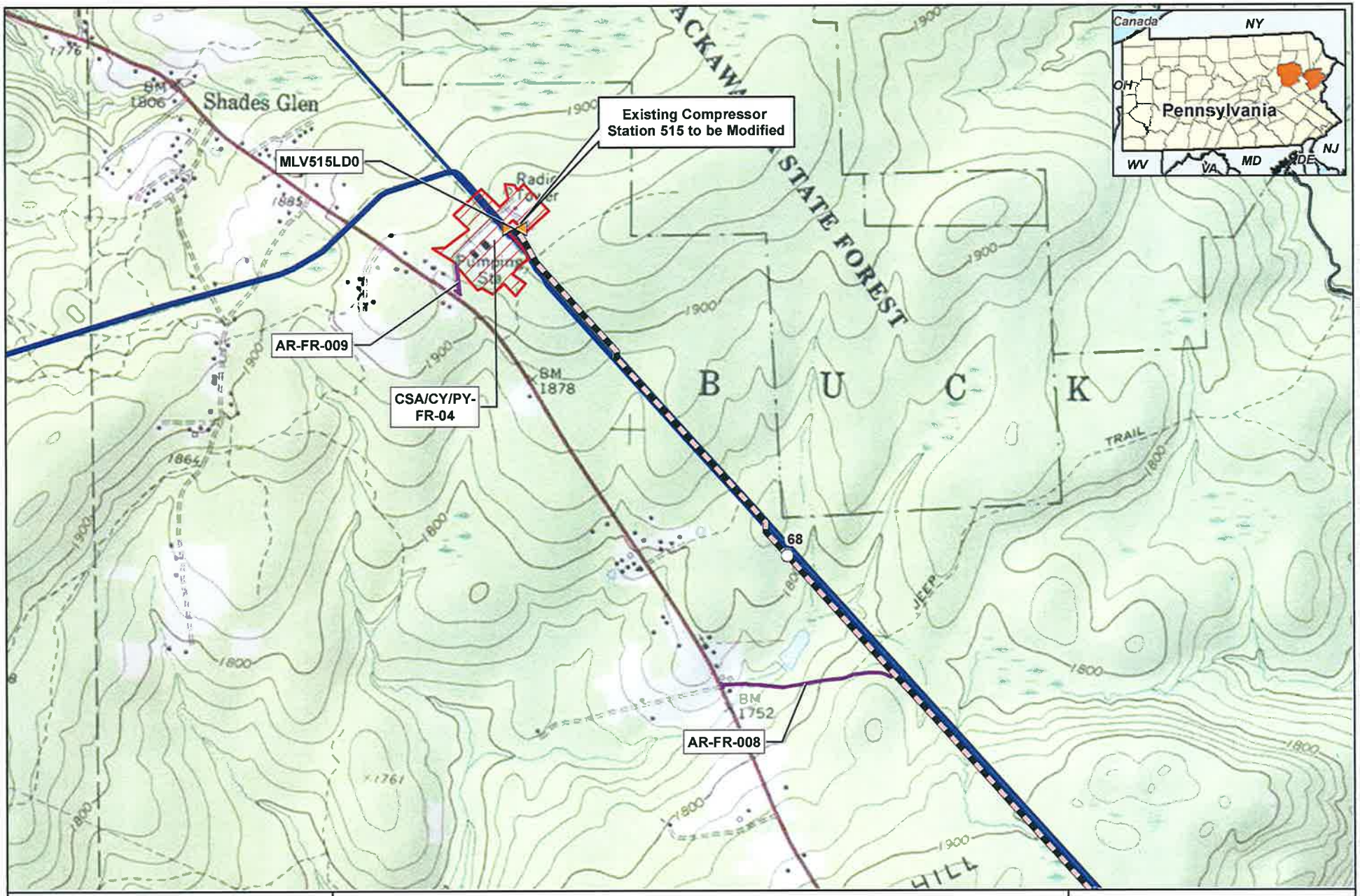
Appendix A

Leidy Southeast Expansion Project

Franklin Loop

Luzerne and Monroe Counties, Pennsylvania

- Existing Transco Pipeline System
- Proposed Franklin Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road



0 750 1,500 Feet

1 inch = 1,500 feet

N W E S

Page 5 of 5

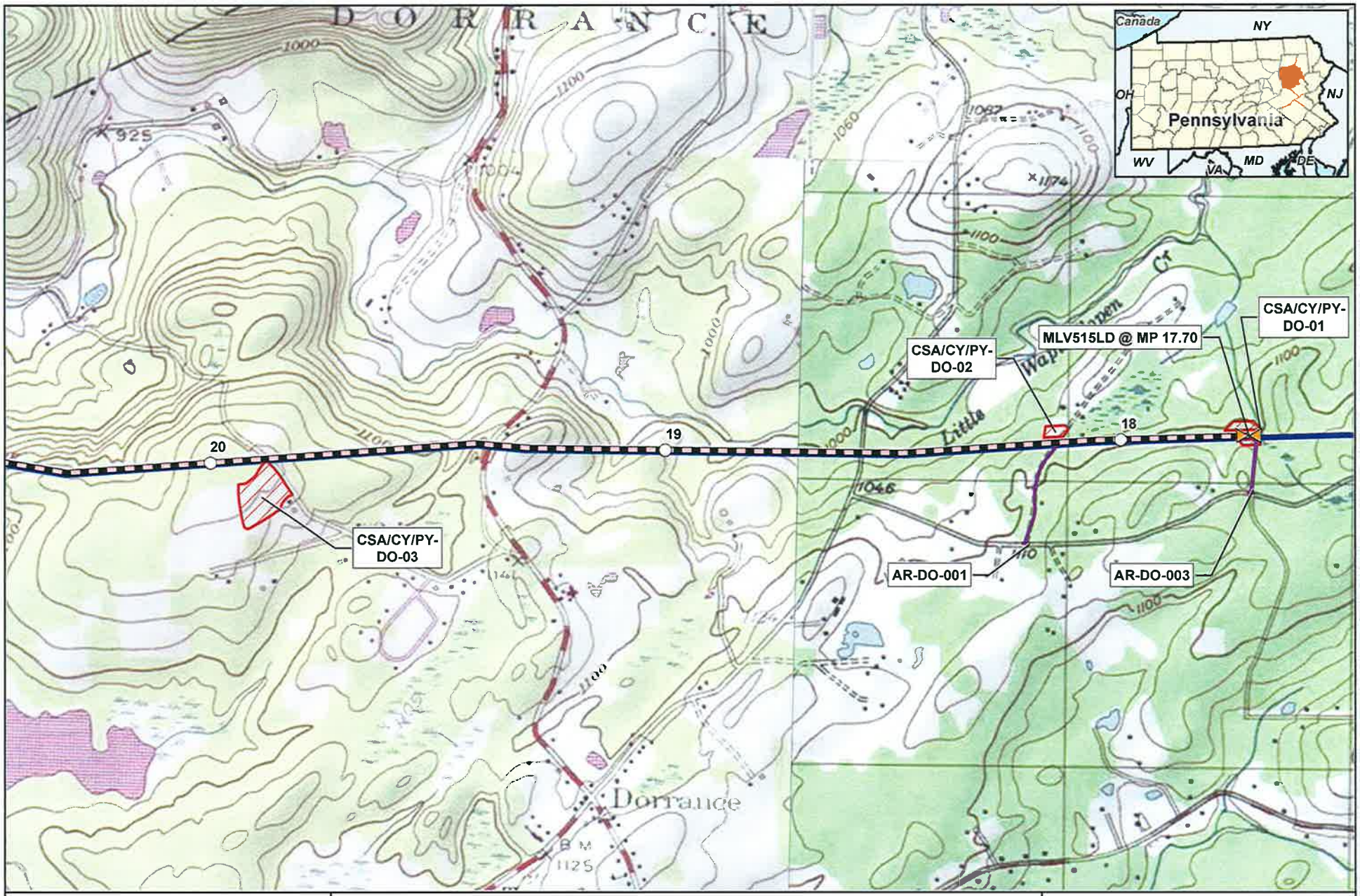
Appendix A

Leidy Southeast Expansion Project

Franklin Loop

Luzerne and Monroe Counties, Pennsylvania

- Existing Transco Pipeline System
- Proposed Franklin Loop
- Proposed Pipe/Contractor Storage Yard
- Proposed Main Line Valve and/or Pig Launcher/ Receiver to be Installed, Modified, or Removed
- Proposed Access Road



Appendix A
Leidy Southeast Expansion Project
Dorrance Loop
Luzerne County, Pennsylvania

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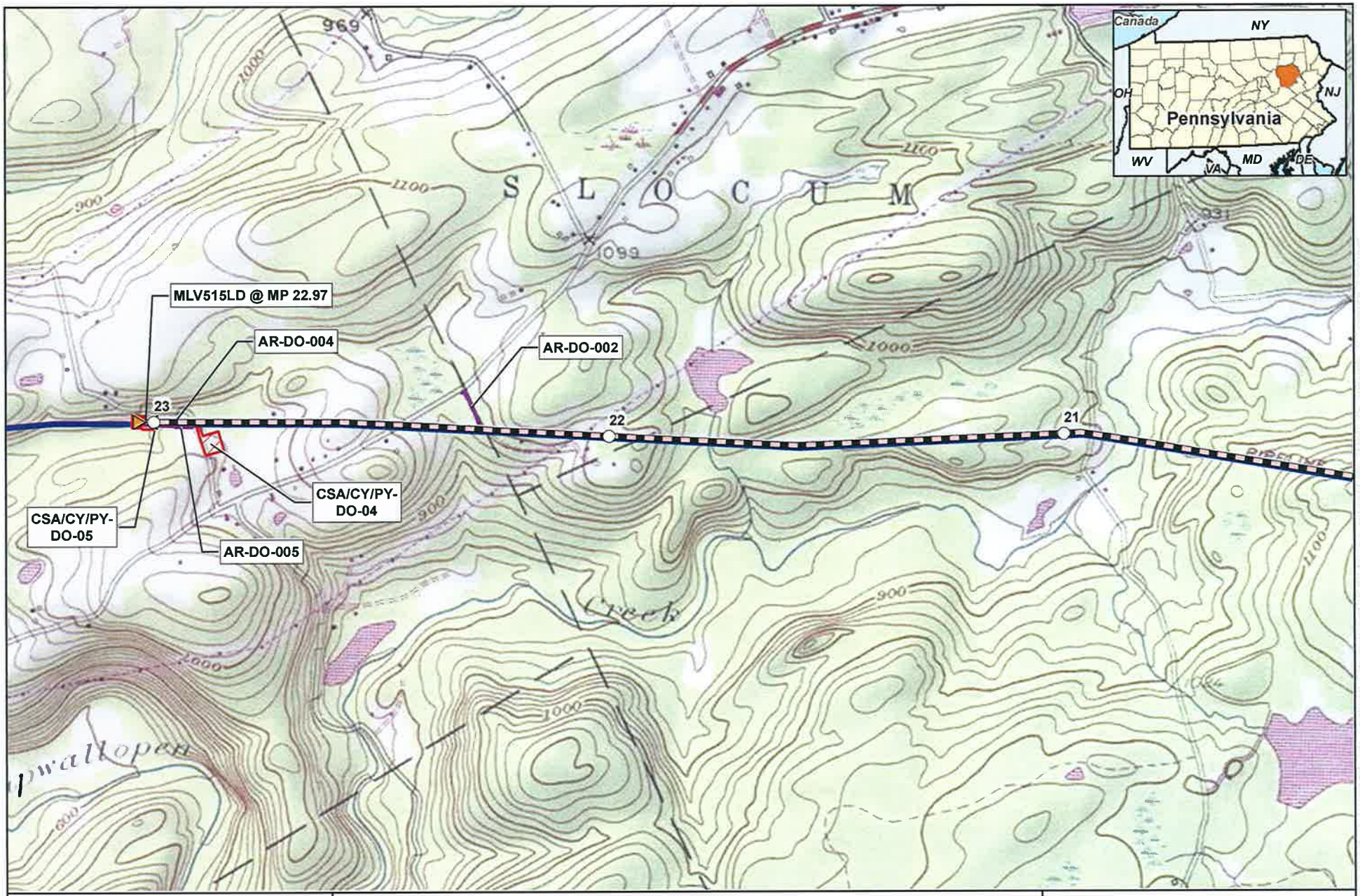
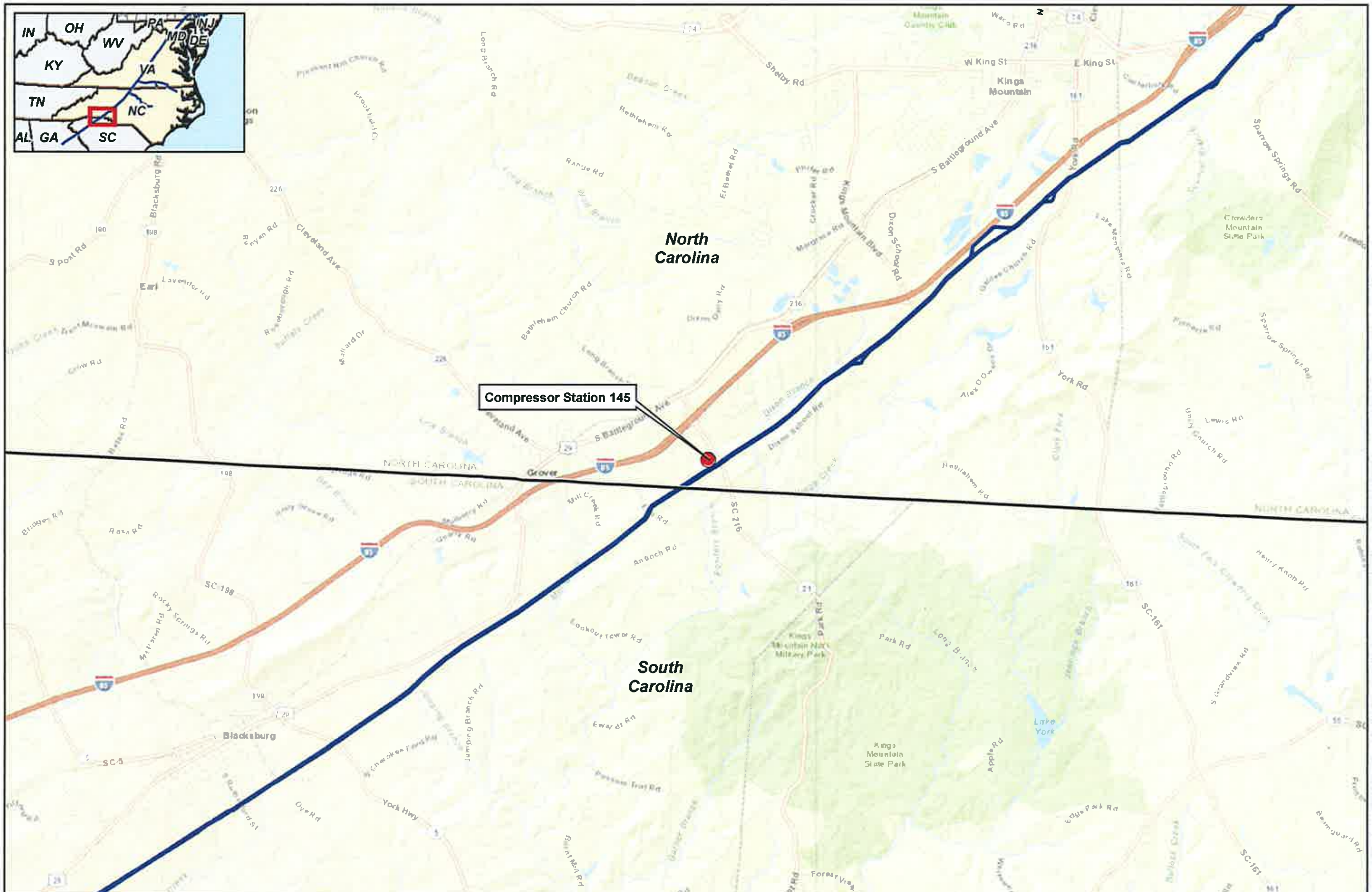
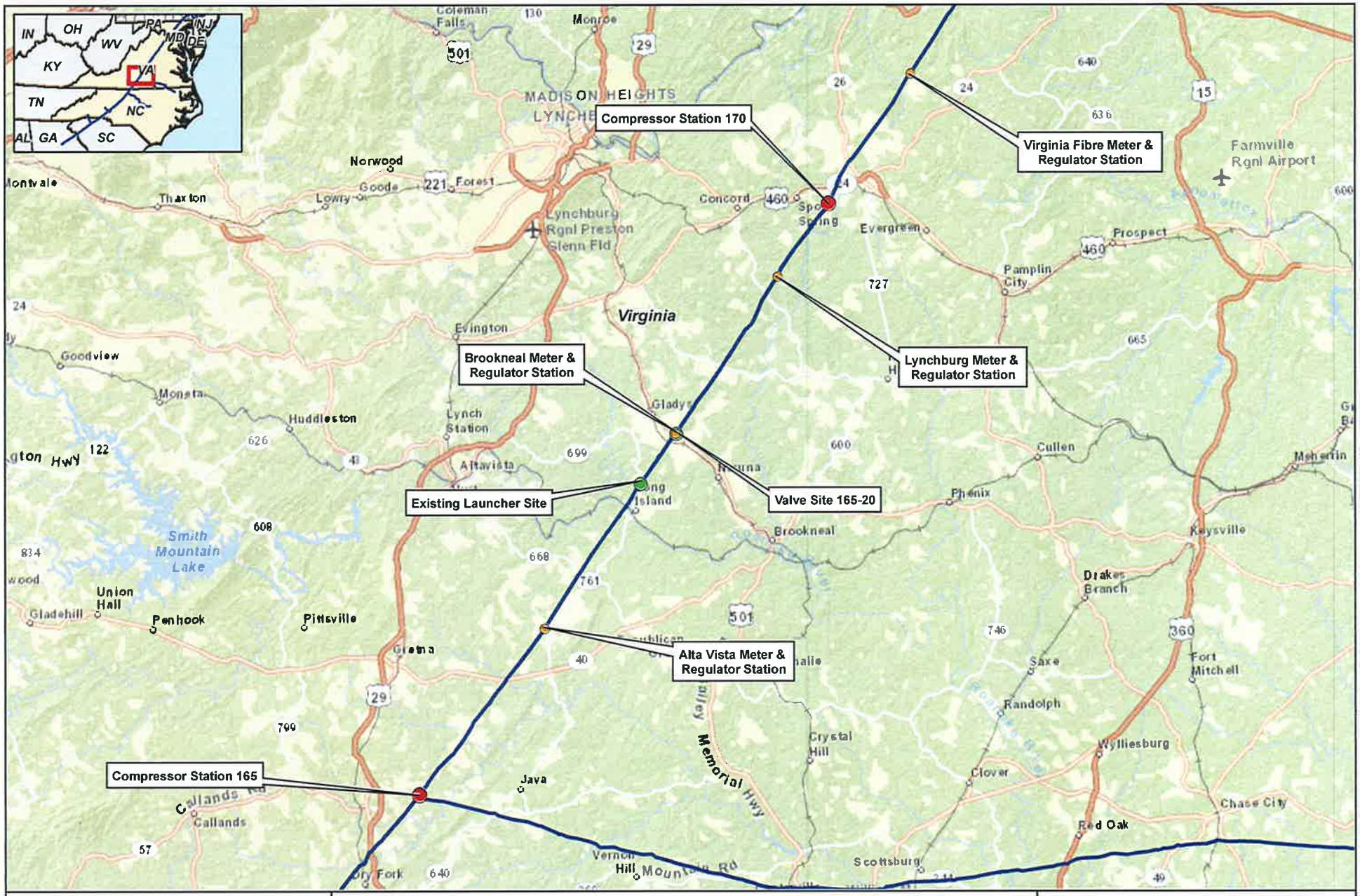


Appendix A
Leidy Southeast Expansion Project
Dorrance Loop
Luzerne County, Pennsylvania



0 1 2 Miles N S W E Page 1 of 5	**Appendix A** **Leidy Southeast Expansion Project** **Existing Compressor Stations, Mainline Valves, and Meter and Regulator Stations to be Modified** **Maryland, Virginia and North Carolina**	Valve Site Meter and Regulator Station Compressor Station Existing Transco Pipeline System

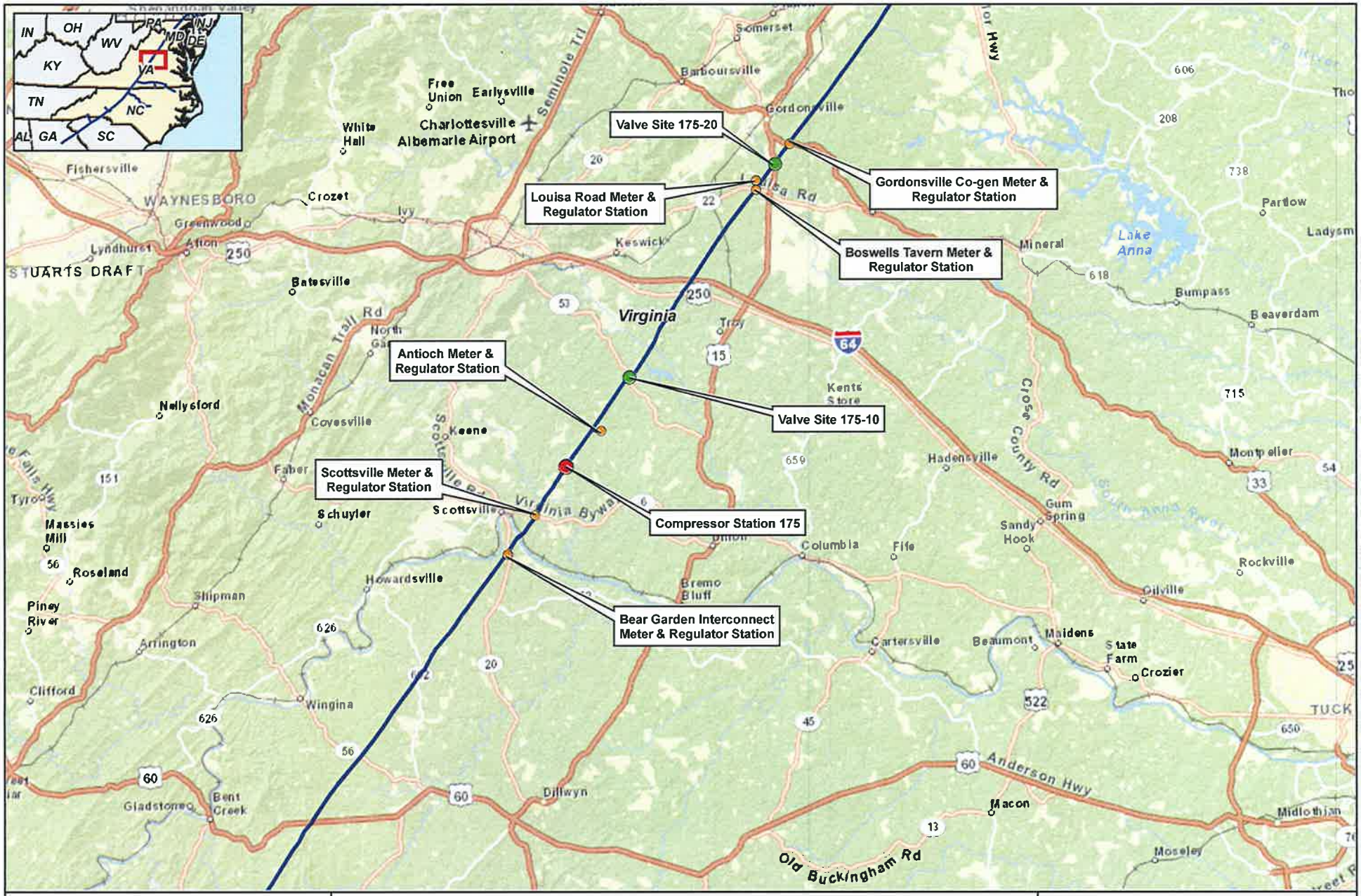


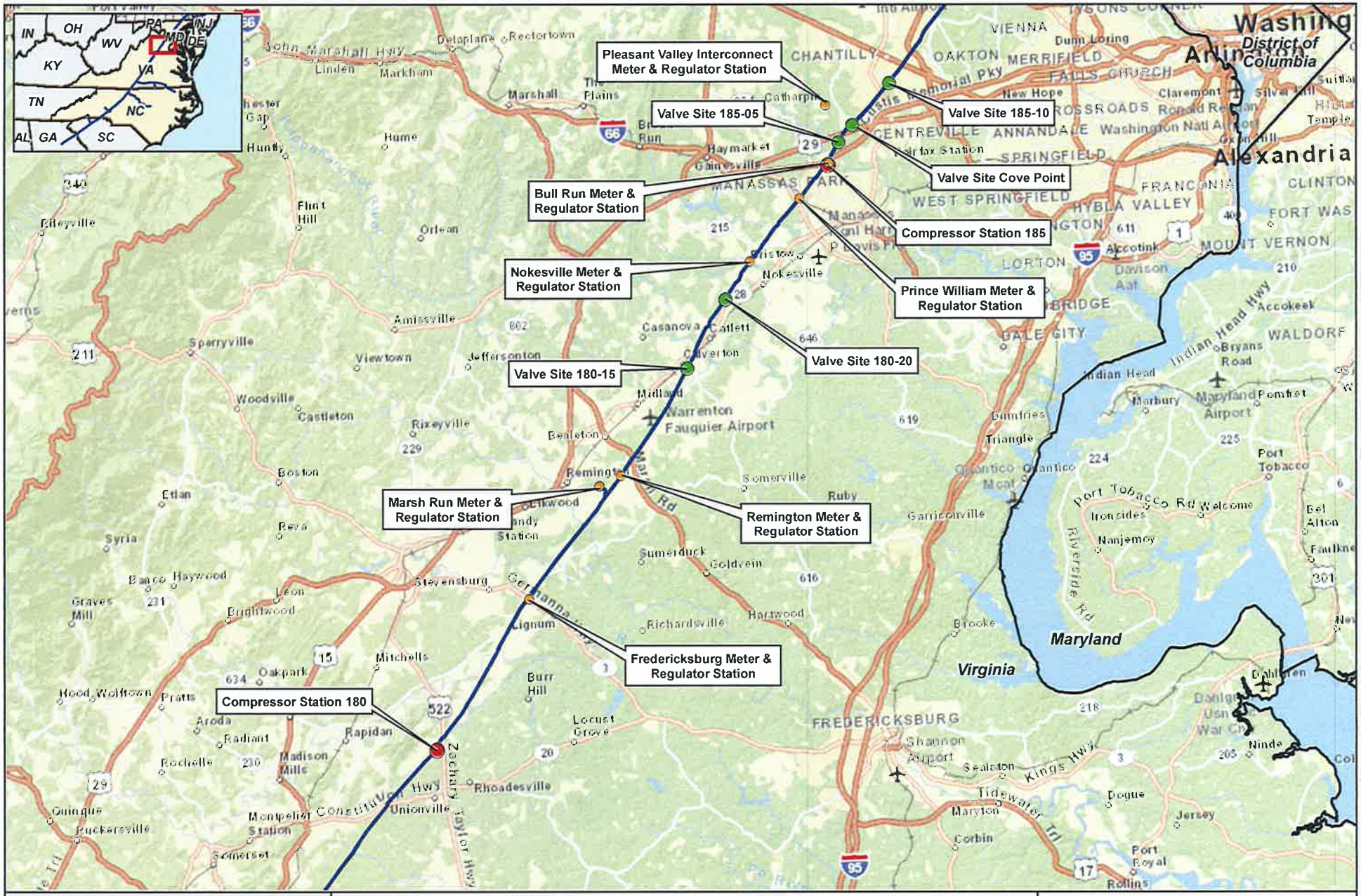
Appendix A

Leidy Southeast Expansion Project

Existing Compressor Stations, Mainline Valves, and Meter and Regulator Stations to be Modified
Maryland, Virginia and North Carolina

Page 2 of 5


Valve Site 175-20
Gordonsville Co-gen Meter & Regulator Station
Louisa Road Meter & Regulator Station
Boswells Tavern Meter & Regulator Station
Antioch Meter & Regulator Station
Valve Site 175-10
Scottsville Meter & Regulator Station
Compressor Station 175
Bear Garden Interconnect Meter & Regulator Station
Virginia
Charlottesville Albemarle Airport
Lake Anna
0 5 10 Miles
N
W
E
S
Page 3 of 5
Appendix A
Leidy Southeast Expansion Project
Existing Compressor Stations, Mainline Valves, and Meter and Regulator Stations to be Modified
Maryland, Virginia and North Carolina
Valve Site
Meter and Regulator Station
Compressor Station
Existing Transco Pipeline System



0 5 10 Miles

N W E S

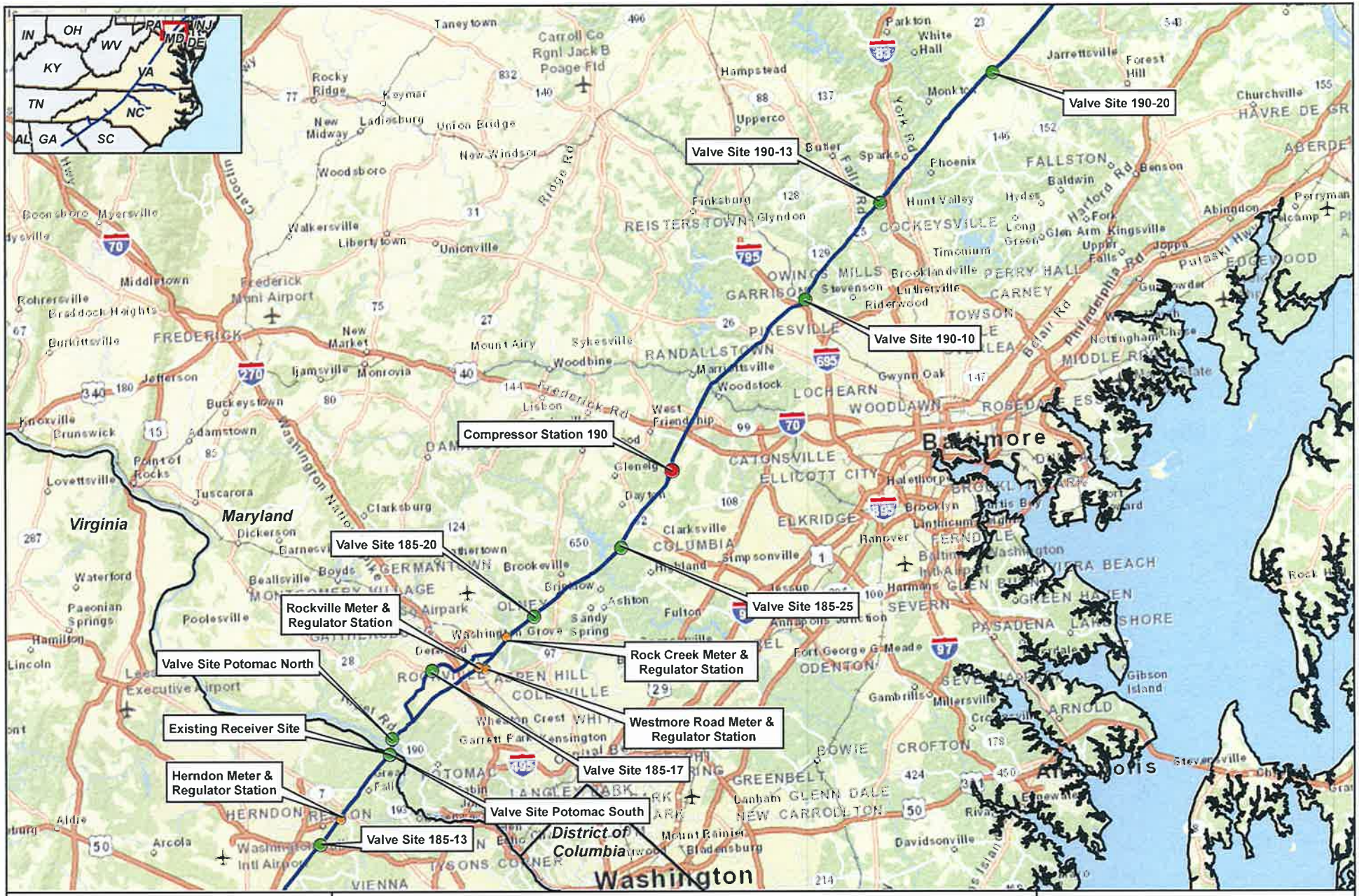
Page 4 of 5

Appendix A

Leidy Southeast Expansion Project

Existing Compressor Stations, Mainline Valves, and Meter and Regulator Stations to be Modified
Maryland, Virginia and North Carolina

- Valve Site
- Meter and Regulator Station
- Compressor Station
- Existing Transco Pipeline System



A-18

0 5 10 Miles

N W E S

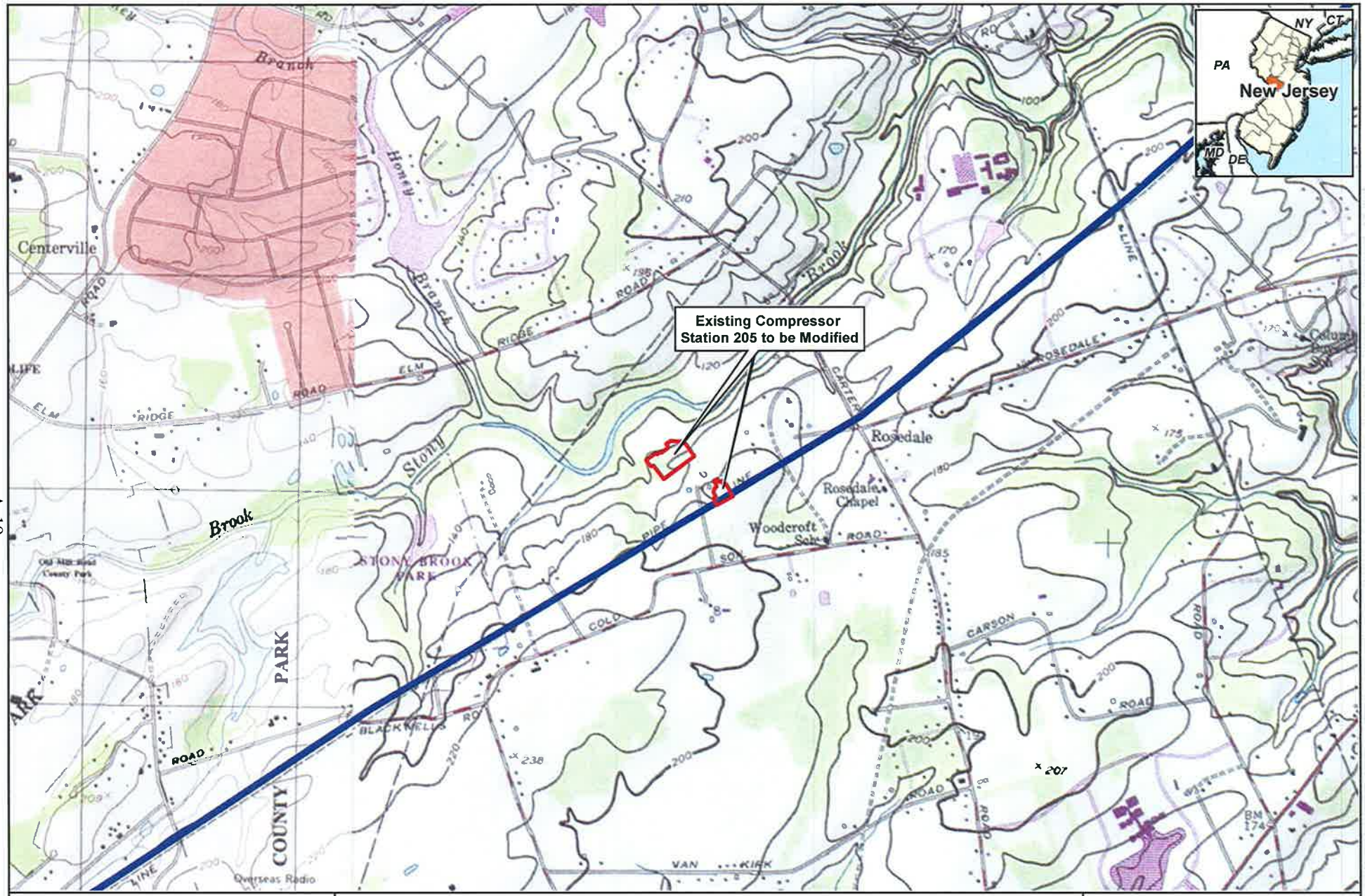
Page 5 of 5

Appendix A

Leidy Southeast Expansion Project

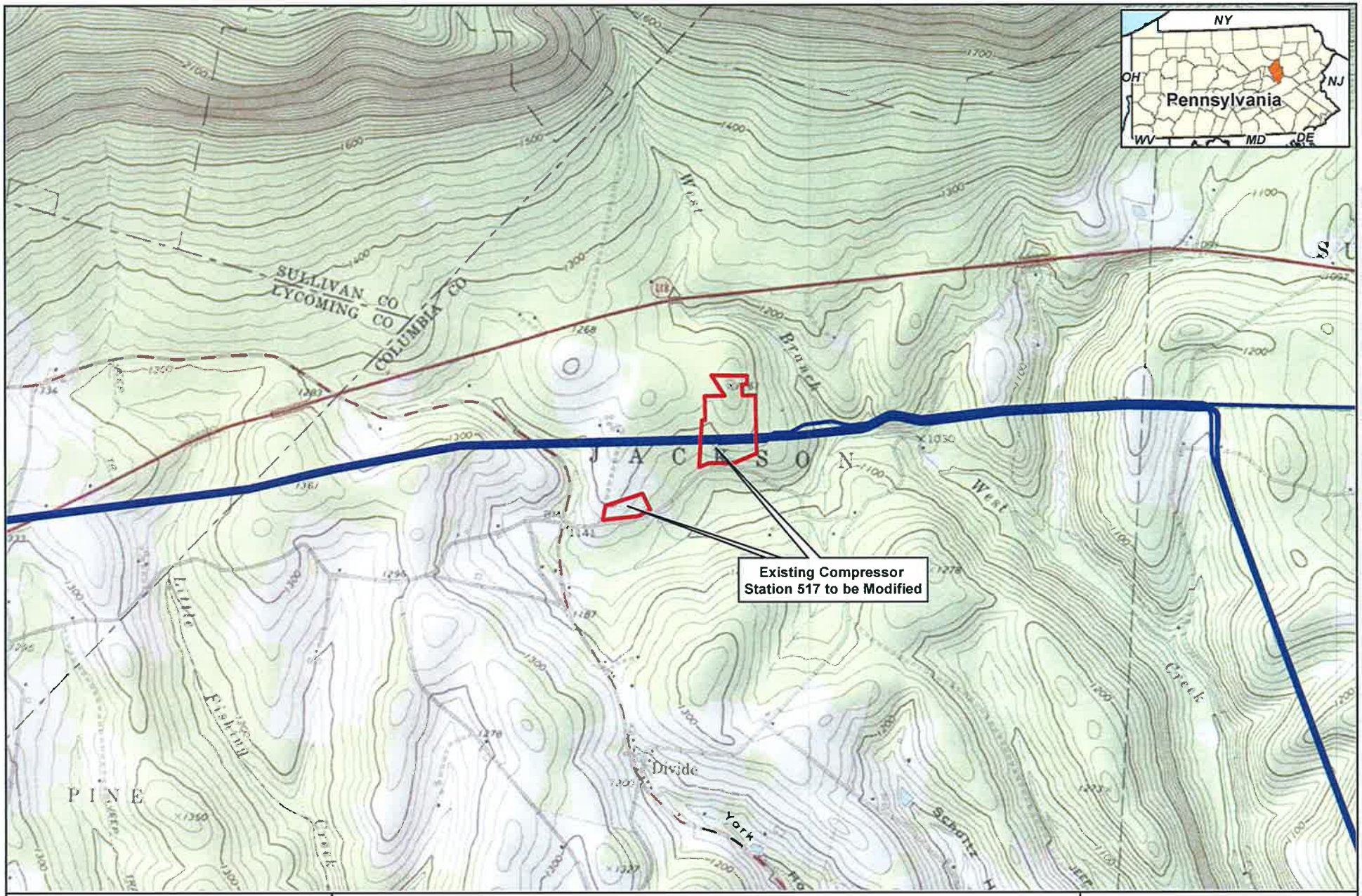
Existing Compressor Stations, Mainline Valves, and Meter and Regulator Stations to be Modified
Maryland, Virginia and North Carolina

- Valve Site
- Meter and Regulator Station
- Compressor Station
- Existing Transco Pipeline System



Appendix A
Leidy Southeast Expansion Project
Compressor Station 205
Mercer County, New Jersey

Existing Transco Pipeline System



0 1,000 2,000 Feet

1 inch = 2,000 feet

N W E S

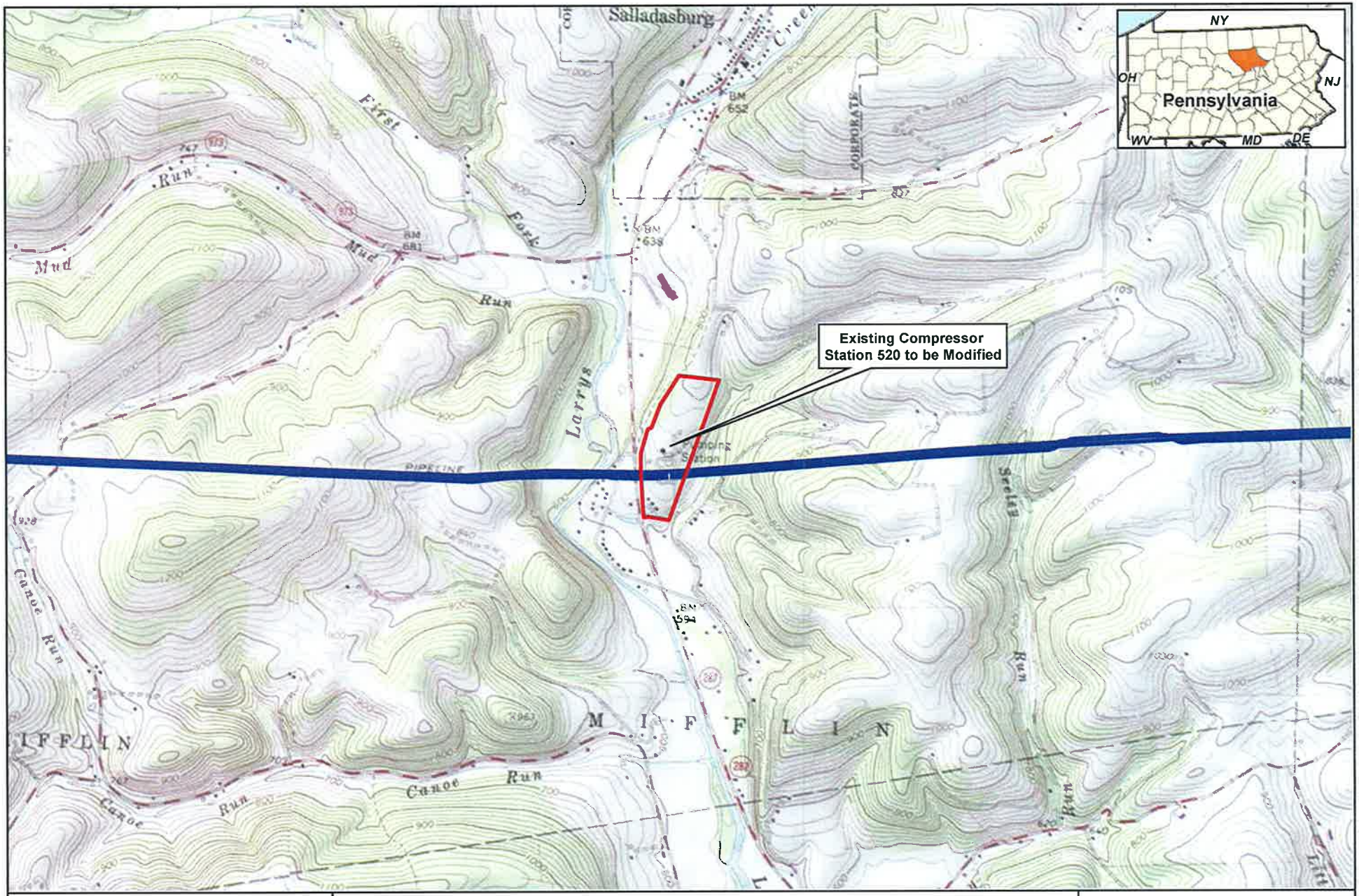
Appendix A

Leidy Southeast Expansion Project

Compressor Station 517

Columbia County, Pennsylvania

Existing Transco Pipeline System



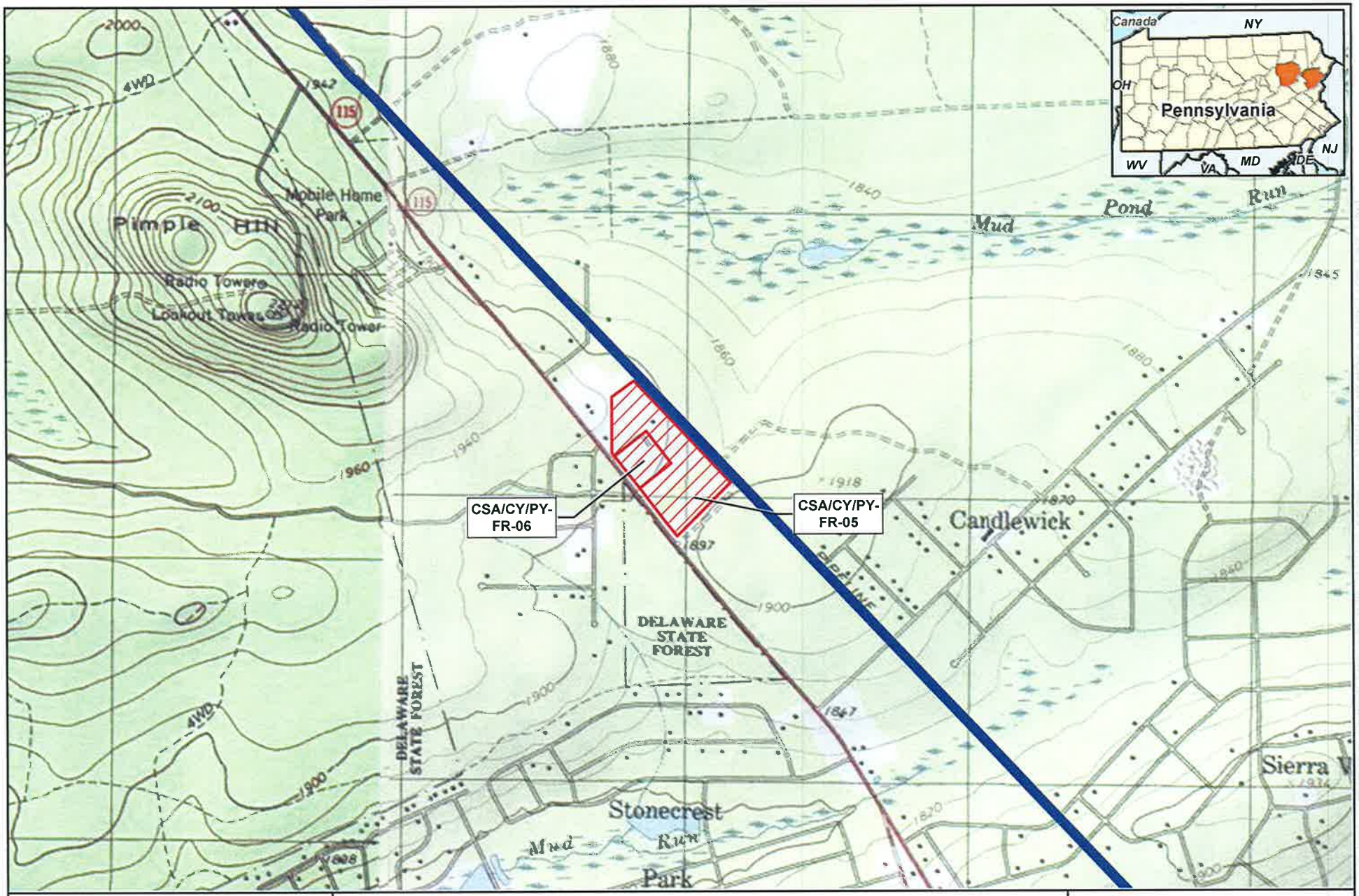
Appendix A

Leidy Southeast Expansion Project

Compressor Station 520

Lycoming County, Pennsylvania

Existing Transco Pipeline System



Appendix A

Leidy Southeast Expansion Project

Mount Effort Contractor and Pipe Storage Yard

Monroe County, Pennsylvania

APPENDIX B

TEMPORARY AND PERMANENT ACCESS ROADS REQUIRED FOR THE PROJECT

APPENDIX B

Temporary and Permanent Access Roads Required for the Project

Facility/Road Name	County/State	Approx. MP	Status (Existing or Proposed)	Use (Permanent or Temporary)	Surface Type	Upgrade Requirements	Access Road Justification	Approx Length (feet)	Approx Width (feet)	Area Affected (acres)	Post Construction Status
Pipeline Facilities											
Skillman Loop											
AR-SK-001A	Somerset, NJ	1779.33	Proposed	Temporary	Vegetation	Trim trees and add aggregate	Required for access to ROW for HDD Entries	1,562	20	0.72	Restore
AR-SK-002	Somerset, NJ	1782.77	Proposed	Temporary	Vegetation	Construct and add aggregate	Required for access to ROW near major road crossing	467	20	0.23	Restore
Pleasant Run Loop											
AR-PR-004	Somerset, NJ	0.30	Existing	Temporary	Dirt	Add aggregate	Required for access to ROW and contractor yard	617	20	0.28	Restore
AR-PR-002	Somerset, NJ	1.29	Existing	Temporary	Dirt	Add aggregate	Required for access to ROW adjacent to powerline	280	12	0.08	Restore
AR-PR-003	Somerset, NJ	1.85	Existing	Temporary	Asphalt/Gravel/Dirt	Trim trees and add aggregate	Required for access to ROW near road and stream crossing	55	14	0.03	Restore
Franklin Loop											
AR-FR-011	Monroe, PA	NA	Existing	Permanent	Asphalt/Gravel/Dirt	Trim trees and add aggregate	Required for access to Mt. Effor Pipe yard.	57	40	0.07	Retain for access
AR-FR-010	Monroe, PA	59.56	Existing	Temporary	Asphalt/Gravel/Dirt	Trim trees and add aggregate	Required for access to ROW adjacent to business along major roadway	4,005	12	1.11	Restore
AR-FR-001	Monroe, PA	60.53	Existing	Temporary	Asphalt/Gravel/Dirt	Trim trees and add aggregate	Required for access to ROW adjacent to business along major roadway	4,169	12	1.19	Restore
AR-FR-002	Monroe, PA	60.87	Existing	Temporary	Asphalt/Gravel/Dirt	Trim trees and add aggregate	Required for access to ROW near river crossing	4,160	12	1.14	Restore
AR-FR-004	Monroe, PA	63.99	Existing	Temporary	Dirt	Add aggregate	Required for access to ROW adjacent to wetland area	482	12	0.14	Restore

APPENDIX B

Temporary and Permanent Access Roads Required for the Project

Facility/Road Name	County/State	Approx. MP	Status (Existing or Proposed)	Use (Permanent or Temporary)	Surface Type	Upgrade Requirements	Access Road Justification	Approx Length (feet)	Approx Width (feet)	Area Affected (acres)	Post Construction Status
AR-FR-005	Luzerne, PA	65.83	Existing	Temporary	Asphalt/Gravel/Dirt	Trim trees and add aggregate	Required for access to ROW northwest of river crossing	1,345	12	0.38	Restore
AR-FR-006	Luzerne, PA	66.82	Existing	Temporary	Gravel/Dirt	Trim trees and add aggregate	Required for access to ROW on top of steep hill adjacent to wetland area	2,921	12	0.81	Restore
AR-FR-008	Luzerne, PA	67.64	Existing	Temporary	Dirt	Trim trees and add aggregate	Required for access to ROW	1,996	12	0.56	Restore
Dorrance Loop											
AR-DO-001	Luzerne, PA	18.14	Existing	Temporary	Gravel	Trim trees and add aggregate	Required for access to ROW	1,210	12	0.35	Restore
AR-DO-002	Luzerne, PA	22.28	Existing	Temporary	Gravel	Trim trees and add aggregate	Required for access to ROW	410	20	0.20	Restore
AR-DO-005	Luzerne, PA	23.01	Proposed	Temporary	Vegetation	Construct and add aggregate	Required for access to existing meter station during construction	380	12	0.10	Restore
Loop Total								**24,116**		**7.39**	
Aboveground Facilities											
MLV515LD @ MP 17.70 (Dorrance Loop)											
AR-DO-003	Luzerne, PA	17.70	Proposed	Permanent	Vegetation	Construct, trim trees and add aggregate	Required to access existing ROW and proposed mainline valve site	738	20	0.35	Retain for access
MLV515LD @ MP 22.97 (Dorrance Loop)											
AR-DO-004	Luzerne, PA	23.01	Existing	Permanent	Gravel	Add aggregate	Required to access existing ROW and proposed mainline valve site	435	12	0.13	Retain for access
MLV505LD @ MP 63.19 (Franklin Loop)											
AR-FR-003	Monroe, PA	63.19	Proposed	Permanent	Vegetation	Construct and add aggregate	Required for access to proposed mainline valve site	70	12	0.03	Retain for access

APPENDIX B

Temporary and Permanent Access Roads Required for the Project

Facility/Road Name	County/State	Approx. MP	Status (Existing or Proposed)	Use (Permanent or Temporary)	Surface Type	Upgrade Requirements	Access Road Justification	Approx Length (feet)	Approx Width (feet)	Area Affected (acres)	Post Construction Status
MLV515LD0 (Franklin Loop)											
AR-FR-009	Luzerne, PA	68.95	Existing	Permanent	Asphalt/Gravel	None	Required for access to existing ROW and proposed mainline valve site	319	20	0.16	Retain for access
MLV505LC11 (Pleasant Run Loop)											
AR-PR-001	Somerset, NJ	0.12	Existing	Permanent	Asphalt/Gravel	None	Required to access existing ROW and proposed mainline valve site	1,679	25	0.84	Retain for access
MLV200D27 (Skillman Loop)											
AR-SK-001	Mercer, NJ	1776.79	Existing	Permanent	Asphalt/Gravel	Trim trees	Required to access existing ROW and proposed mainline valve site	1,885	20	0.87	Retain for access
MLV200D28 (Skillman Loop)											
AR-SK-003	Somerset, NJ	1783.00	Existing	Permanent	Asphalt/Gravel	Trim trees and add aggregate	Required to access existing ROW and proposed mainline valve site	1,250	20	0.59	Retain for access
Aboveground Facilities Total								**6,376**		**2.97**	
Grand Total								**30,492**		**10.36**	

APPENDIX C

RESIDENTIAL CONSTRUCTION PLANS

Transcontinental Gas Pipe Line Company, LLC.

LEIDY SOUTHEAST PROJECT

PROPOSED 42" SKILLMAN LOOP

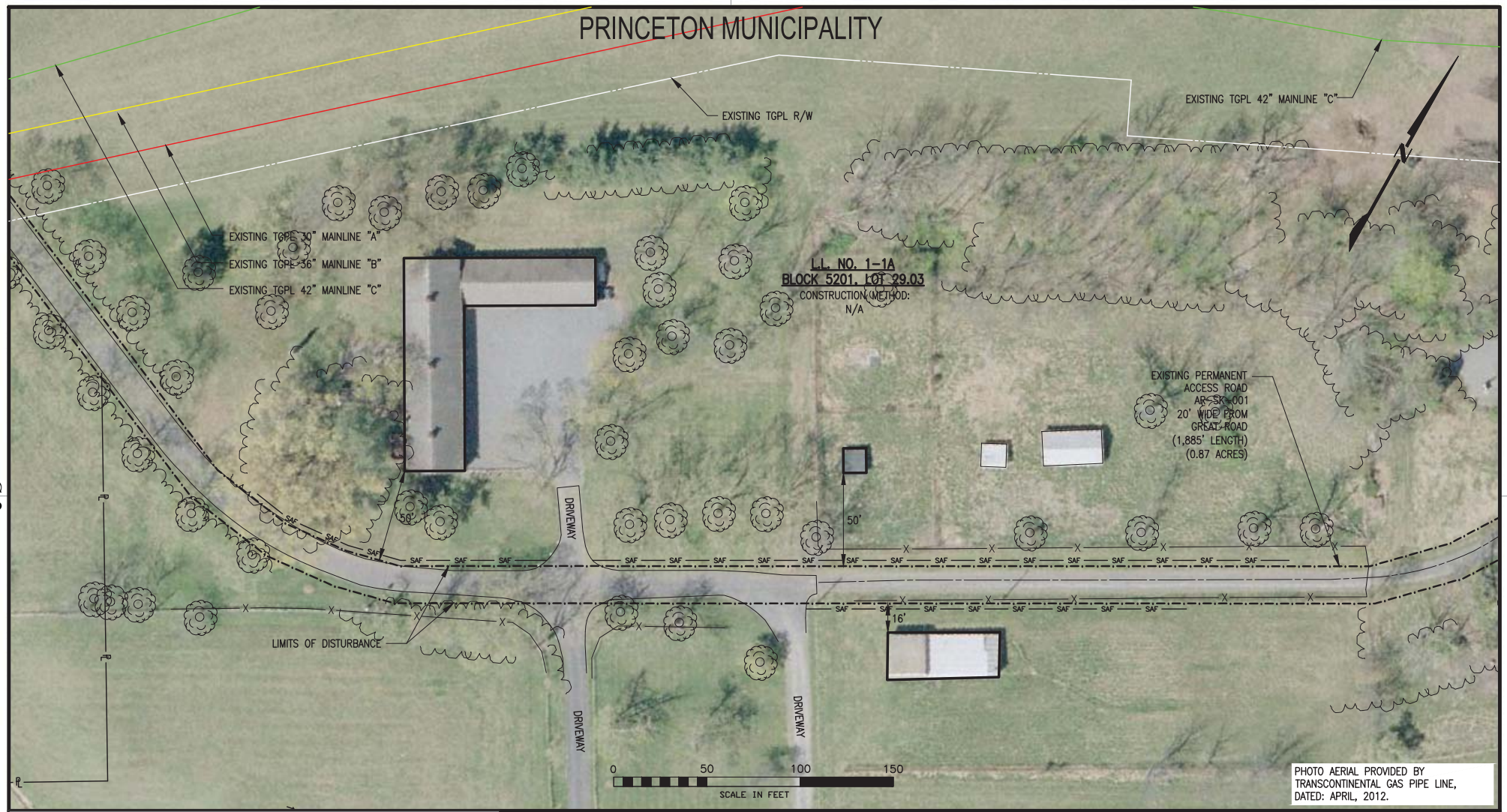
MERCER & SOMERSET COUNTIES, NEW JERSEY

RESIDENTIAL CONSTRUCTION PLAN

6.31 MI. 42" PIPELINE – M.P. 1776.79 TO M.P. 1783.00

DATE: 1-17-2014

C-1

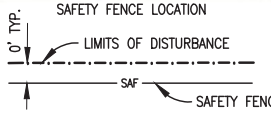


C-2

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH
1	8/7/13	WGMI	ISSUED FOR FINAL	1129995	JD	MJH
2	8/1/13	WGMI	ISSUED FOR REG. FILING	1129995	JD	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

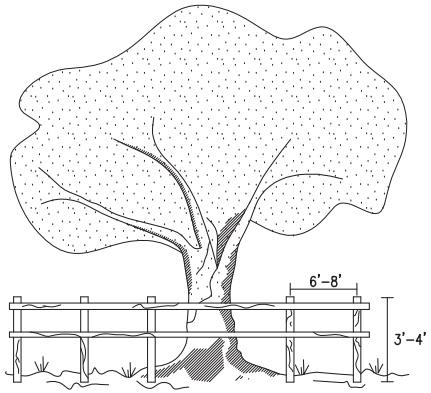
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-1A
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1776.79-D	SHEET 1 OF 2
WO: 1129995		1/17/2014 9:46am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1776.79-D(Road).DWG	

PRINCETON MUNICIPALITY

BARRICADE DETAIL
FOR PROTECTED AND GRAND TREES



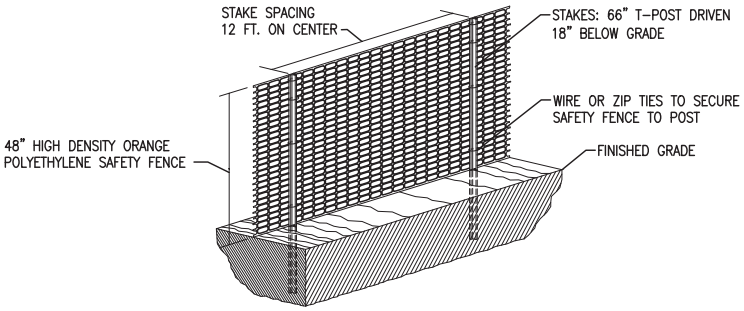
HORIZONTAL: WOOD MEMBER, ORANGE FENCING, CHAIN LINK FENCE OR OTHER APPROVED MATERIAL
VERTICAL: WOOD MEMBER OR APPROVED MATERIAL
BARRICADES PLACED AT DESIGNATED PROTECTIVE ROOT ZONE.

1. ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
2. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY FENCE 3 FEET OUTSIDE THE DRIP LINE OF THE TREE.
3. SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE POST.
4. THE FENCE MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

NOTES:

1. CONSTRUCTION TECHNIQUES TO BE USED TO MINIMIZE IMPACT TO THIS RESIDENCE ARE DENOTED ON SHEET 1 OF THIS DRAWING. CONSTRUCTION TECHNIQUES INCLUDE REDUCED PIPELINE SEPARATION (N), DRAG SECTION (D), WORKING OVER EXISTING PIPELINE (W), PIPELINE CROSSOVERS (C), REDUCED CONSTRUCTION RIGHT-OF-WAY (R).
2. EXCAVATION OF THE PIPELINE TRENCH WILL NOT BE INITIATED UNTIL THE PIPE IS READY FOR INSTALLATION. THE PIPELINE TRENCH SHALL BE BACKFILLED IMMEDIATELY UPON COMPLETION OF THE PIPELINE INSTALLATION.
3. HOMEOWNER SHALL BE NOTIFIED ONE (1) WEEK PRIOR TO EXCAVATION OF PIPELINE TRENCH.
4. CONSTRUCTION SAFETY PERIMETER FENCING SHALL BE INSTALLED AND MAINTAINED ALONG THE WORK AREA. "SEE LOCATION DETAIL THIS SHEET. REMOVE AFTER RESTORATION IS COMPLETE."
5. ALL FEATURES WITHIN THE CONSTRUCTION WORK AREA OR LIMITS OF DISTURBANCE SHALL BE REMOVED EXCEPT AS NOTED ON THE DRAWING. MATURE TREES AND LANDSCAPING WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA MAY BE SAVED UNLESS NECESSARY TO REMOVE FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT.
6. CONTRACTOR SHALL MAINTAIN RESIDENTIAL ACCESS AT ALL TIMES. IF APPLICABLE, CONTRACTOR SHALL PROVIDE PRIOR NOTICE TO COMPANY WHEN THE EXISTING DRIVEWAY IS PLANNED TO BE OPEN CUT. COMPANY SHALL THEN NOTIFY THE HOMEOWNER(S). DRIVEWAY ACCESS MAY BE TEMPORARILY CLOSED FOR THE PIPELINE INSTALLATION, STEEL PLATES SHALL BE USED ACROSS THE OPEN TRENCH IF NOT BACKFILLED DURING SAME WORK DAY.
7. THIS PROPERTY
   - ☐ (DOES) ☐ (DOES NOT) HAVE A SEPTIC SYSTEM
   - ☐ (DOES) ☐ (DOES NOT) HAVE A WATER WELL
   - ☐ _____
   - ☐ _____
   - ☐ _____
8. A MOBILE WATER TRUCK WILL BE USED TO CONTROL DUST ON THE R.O.W. AS NEEDED.
9. TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC IS OFFERING PRE-CONSTRUCTION AND POST-CONSTRUCTION MONITORING PROGRAM. THE HOMEOWNER:
   ☐ ACCEPTS ☐ DECLINES TO PARTICIPATE

SAFETY FENCE



DRAWING NO.	REFERENCE TITLE

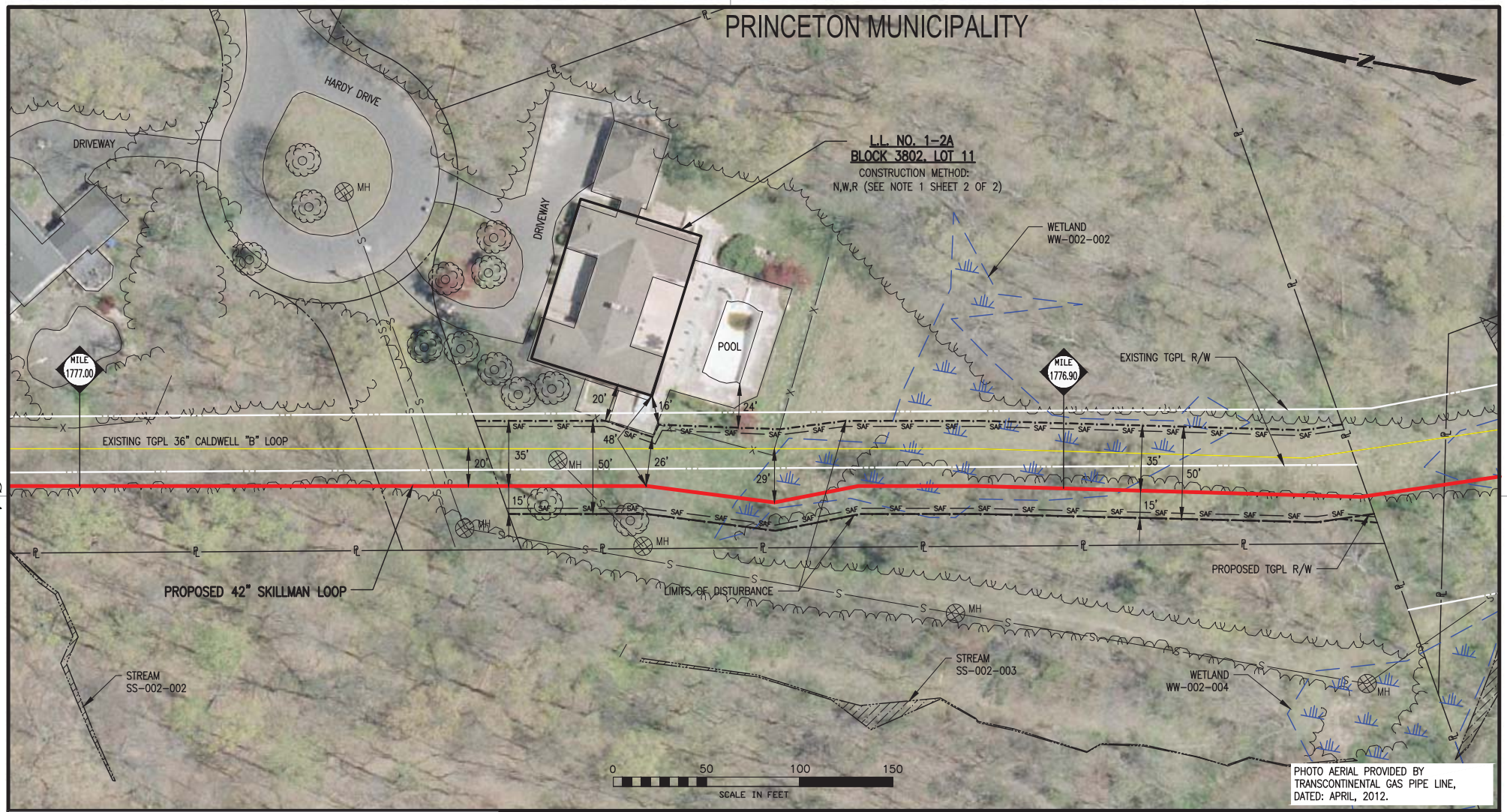
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-1A
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH
1	9/19/13	WGM	ISSUED FOR FINAL DESIGN	1129995	JD	MJH
2	9/16/13	WGM	ISSUED FOR FERC FILING	1129995	JD	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE:
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1776.79-D	SHEET 2 OF 2
WO: 1129995		8:40am 1/17/2014 mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1776.79-D(Road).DWG	

C-3

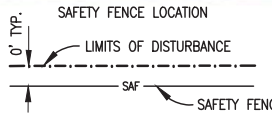


C-4

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



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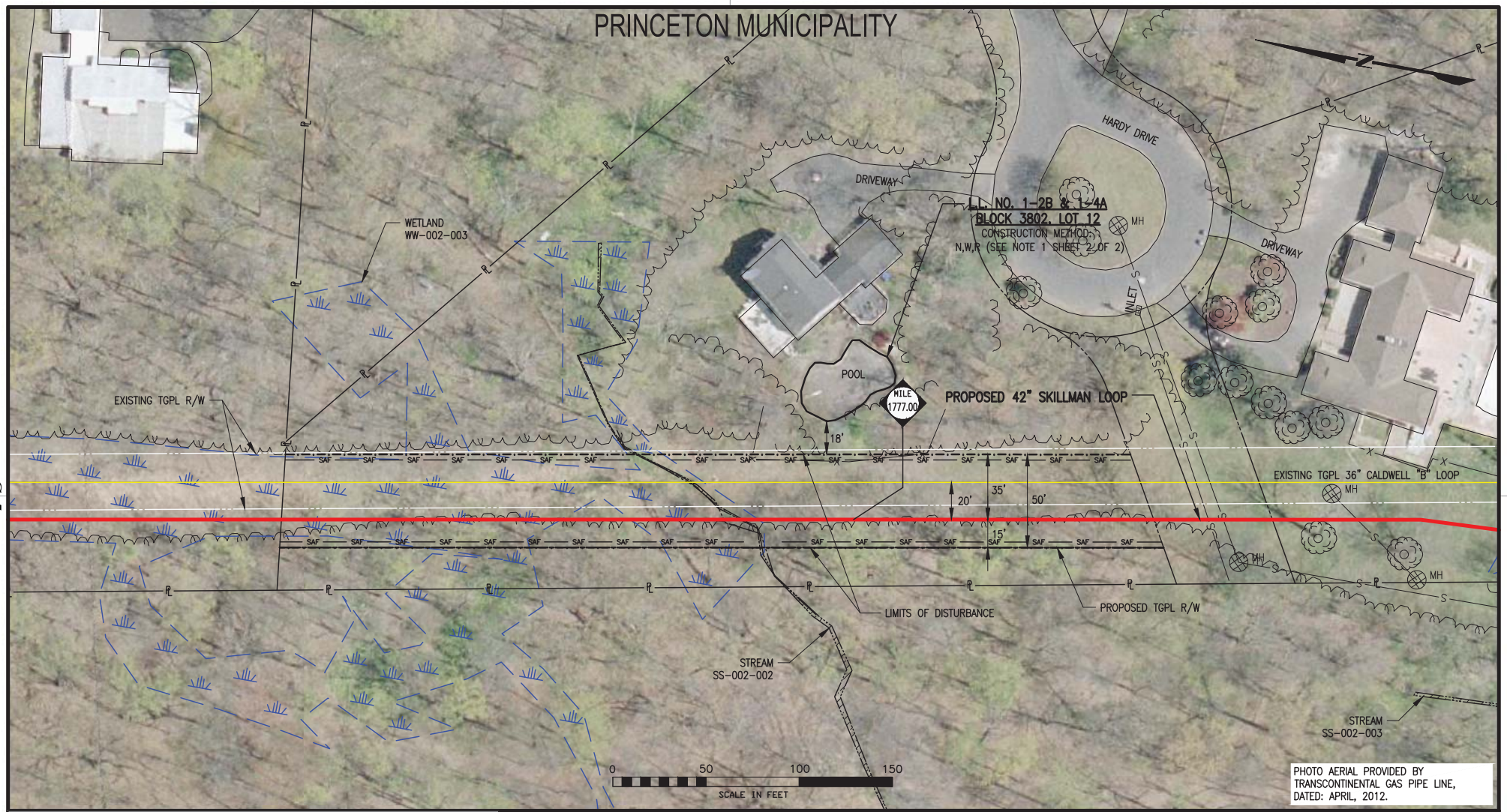
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-2A
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1776.94-D	SHEET 1 OF 2
WO: 1129995		1/14/2014 9:22:2pm K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1776.94-D.DWG	T4NGLYE

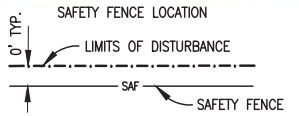


C-5

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



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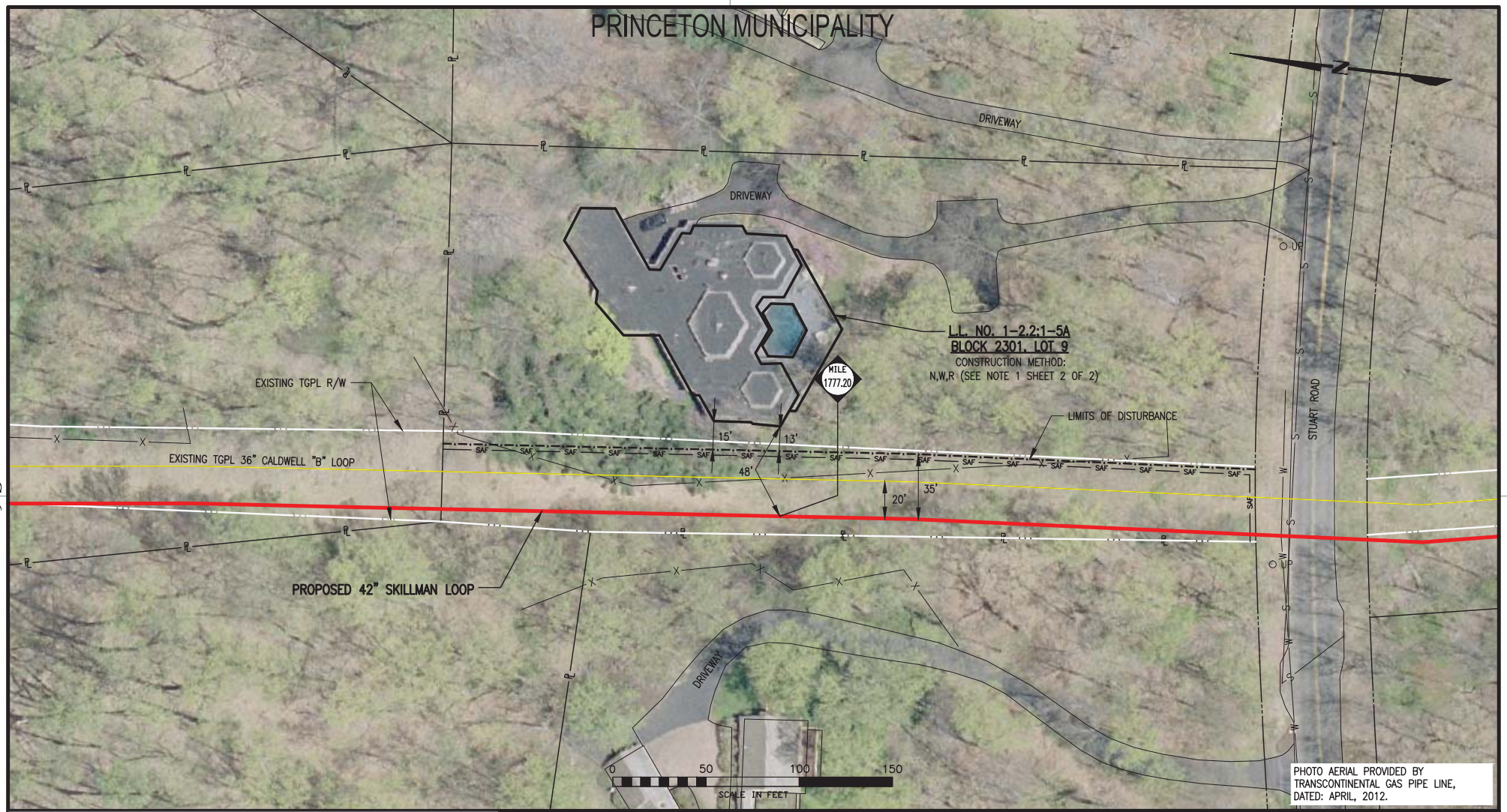
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-2B & 1-4A
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1777.01-D	SHEET 1 OF 2
W.O. NO: 1129995		1/16/2014 mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1777.01-D.DWG	

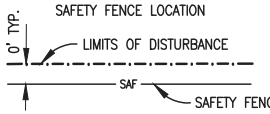


C-6

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

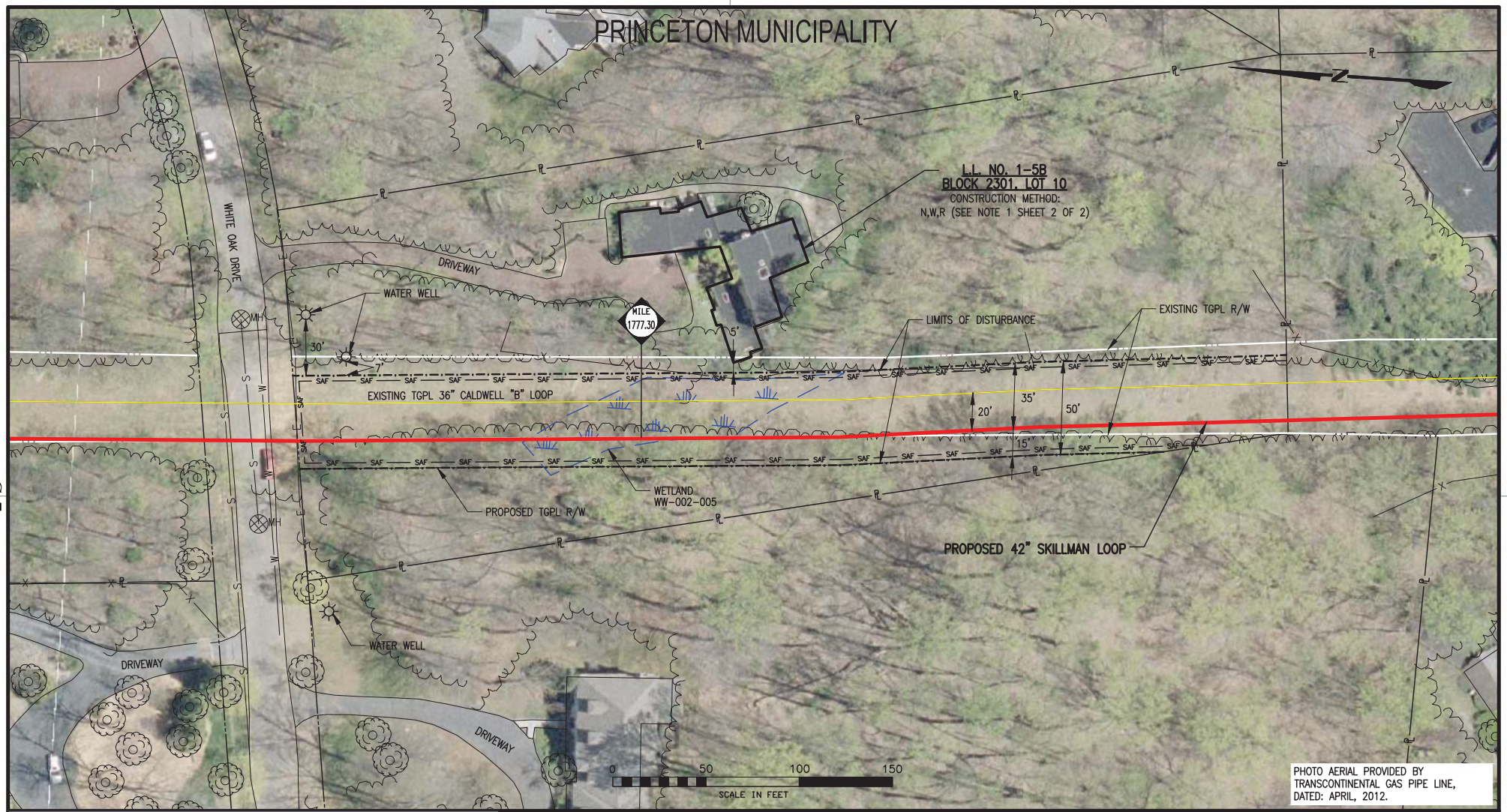
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	REVISED WORKSPACE PER NEW SURVEY	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-2.2;1-5A
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1777.20-D	SHEET 1 OF 2
W.O. 1129995		1/14/2014 11:54am T4NGUYE K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1777.20-D.DWG	

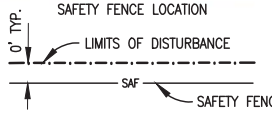


C-7

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

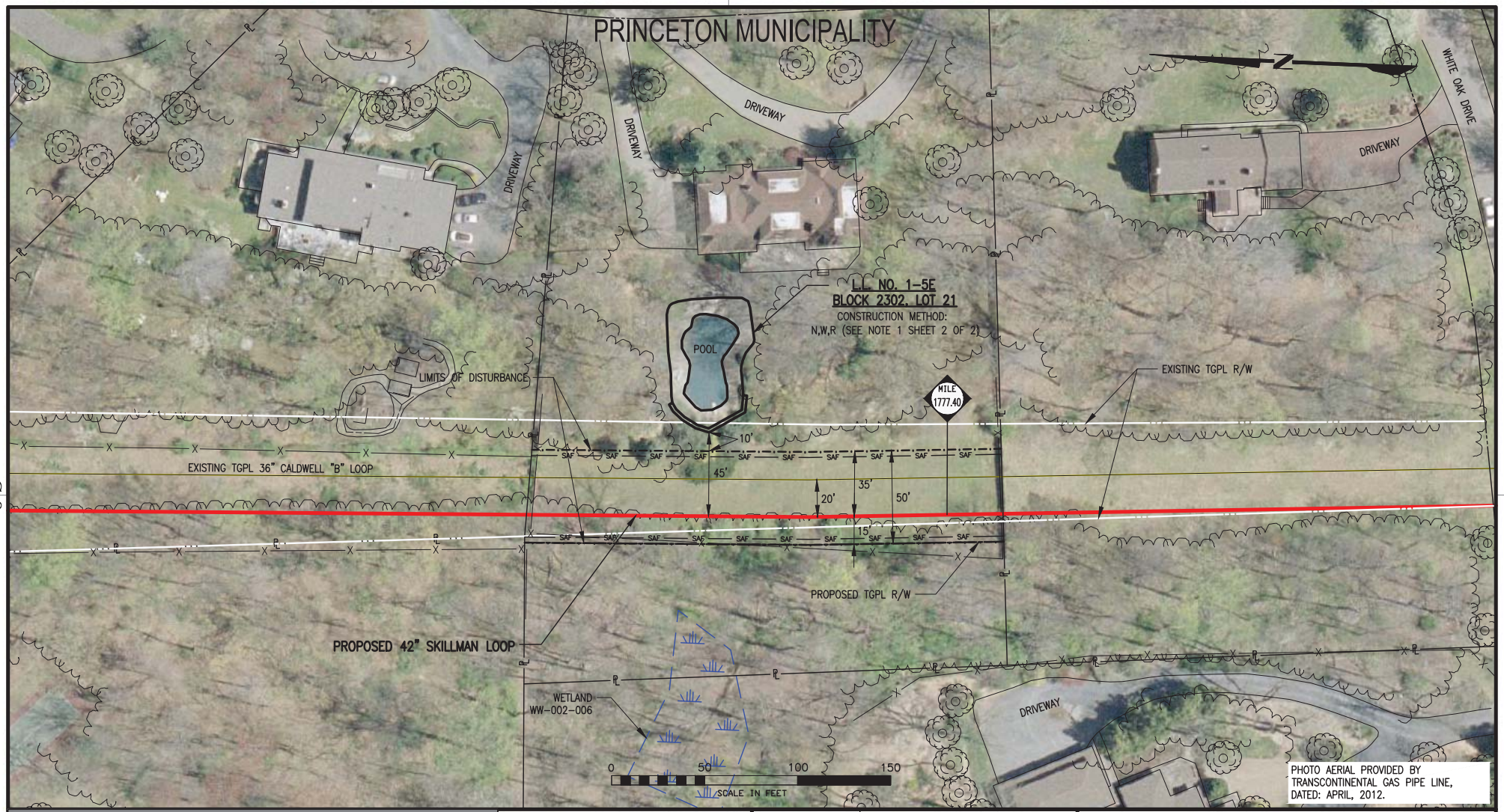
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	REVISED WORKSPACE PER NEW SURVEY	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-5B
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1777.29-D	SHEET 1 OF 2
W.O. 1129995		1/14/2014 11:57am T4NGUYE K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1777.29-D.DWG	

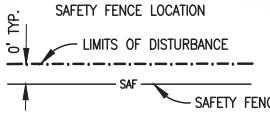


C-8

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

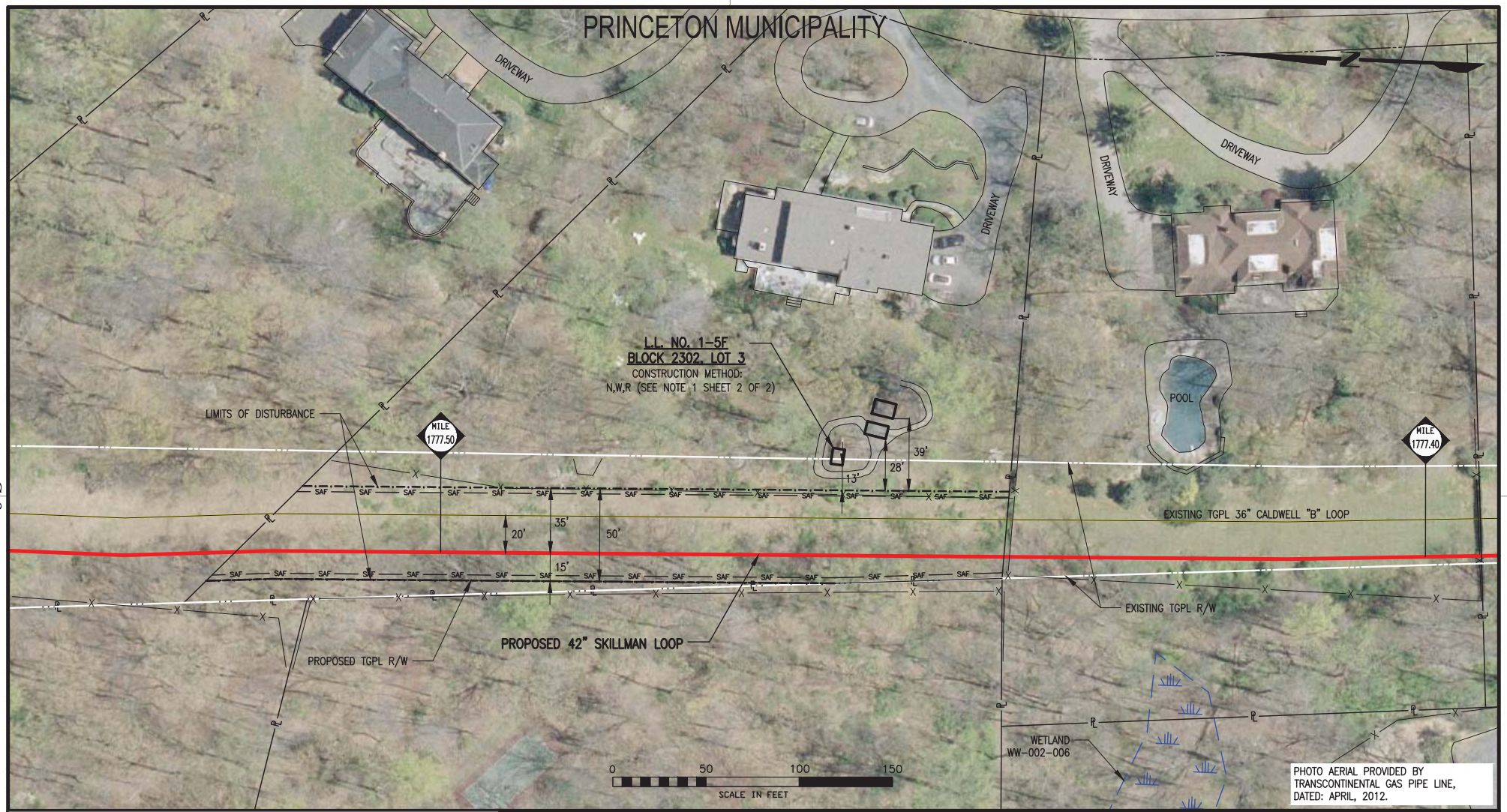
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-5E
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1777.42-D	SHEET 1 OF 2
W.O. 1129995		1/14/2014 12:16pm TANGLYE K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1777.42-D.DWG	

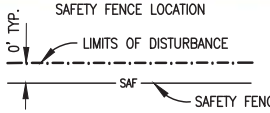


C-9

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

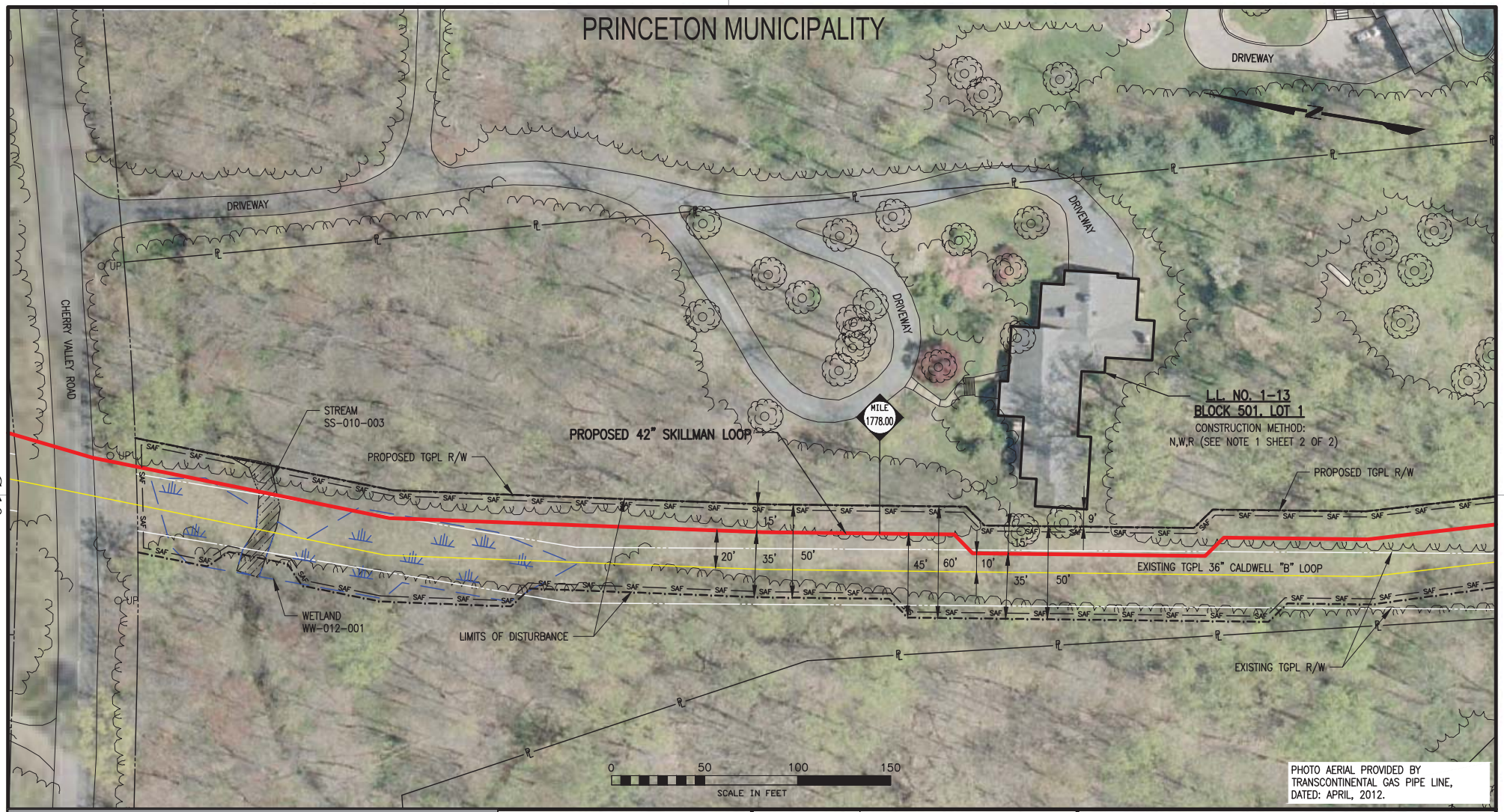
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-5F
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1777.45-D	SHEET 1 OF 2
W.O: 1129995		1/14/2014 2:01pm TANGLYE K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1777.45-D.DWG	

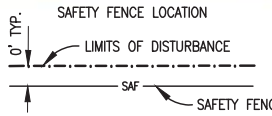


C-10

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

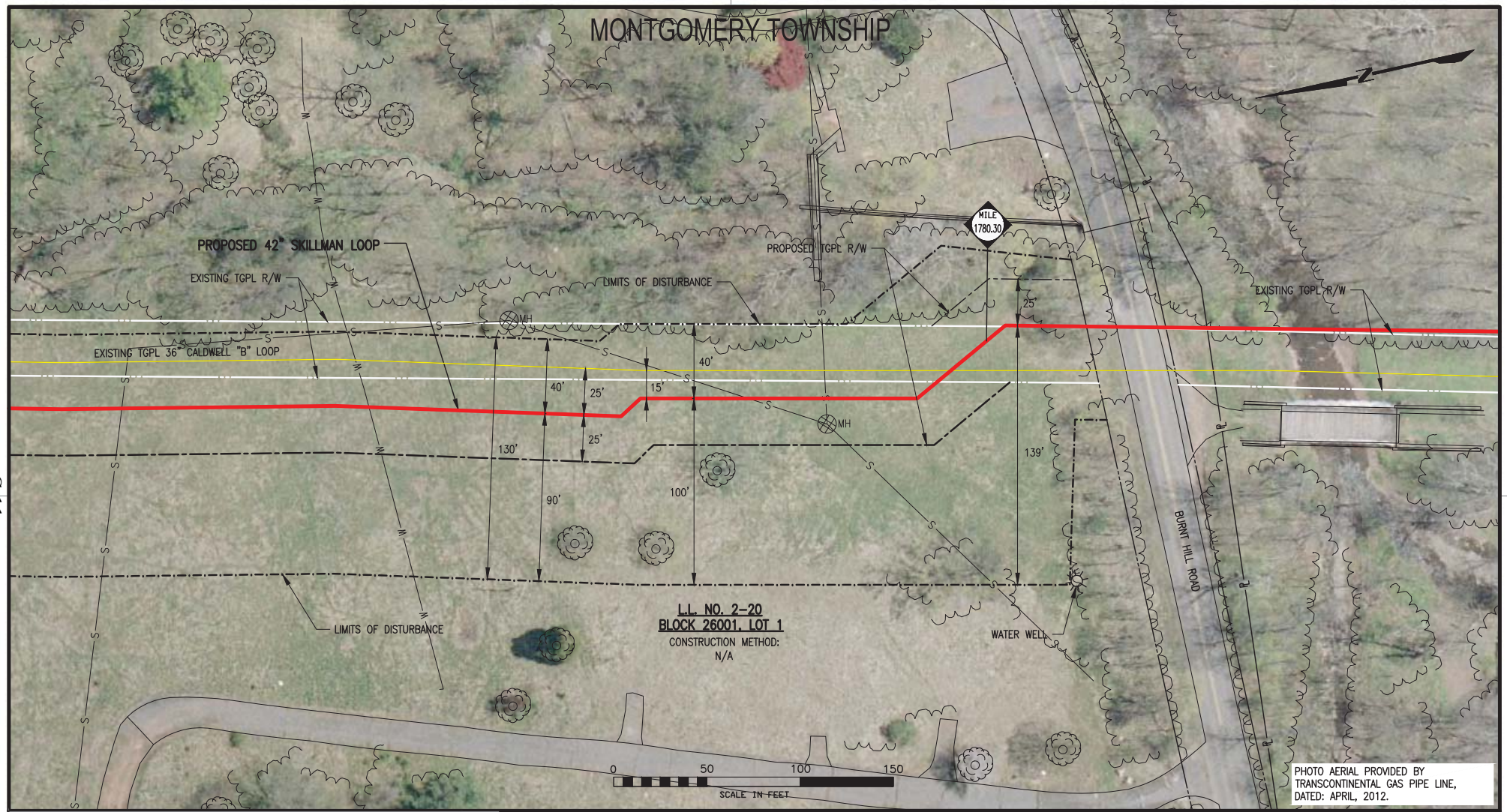
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 1-13
MERCER COUNTY, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1777.97-D	SHEET 1 OF 2
W.O.: 1129995		1/16/2014 9:00am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1777.97-D.DWG	

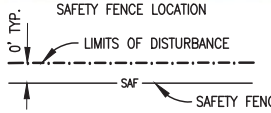


C-11

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

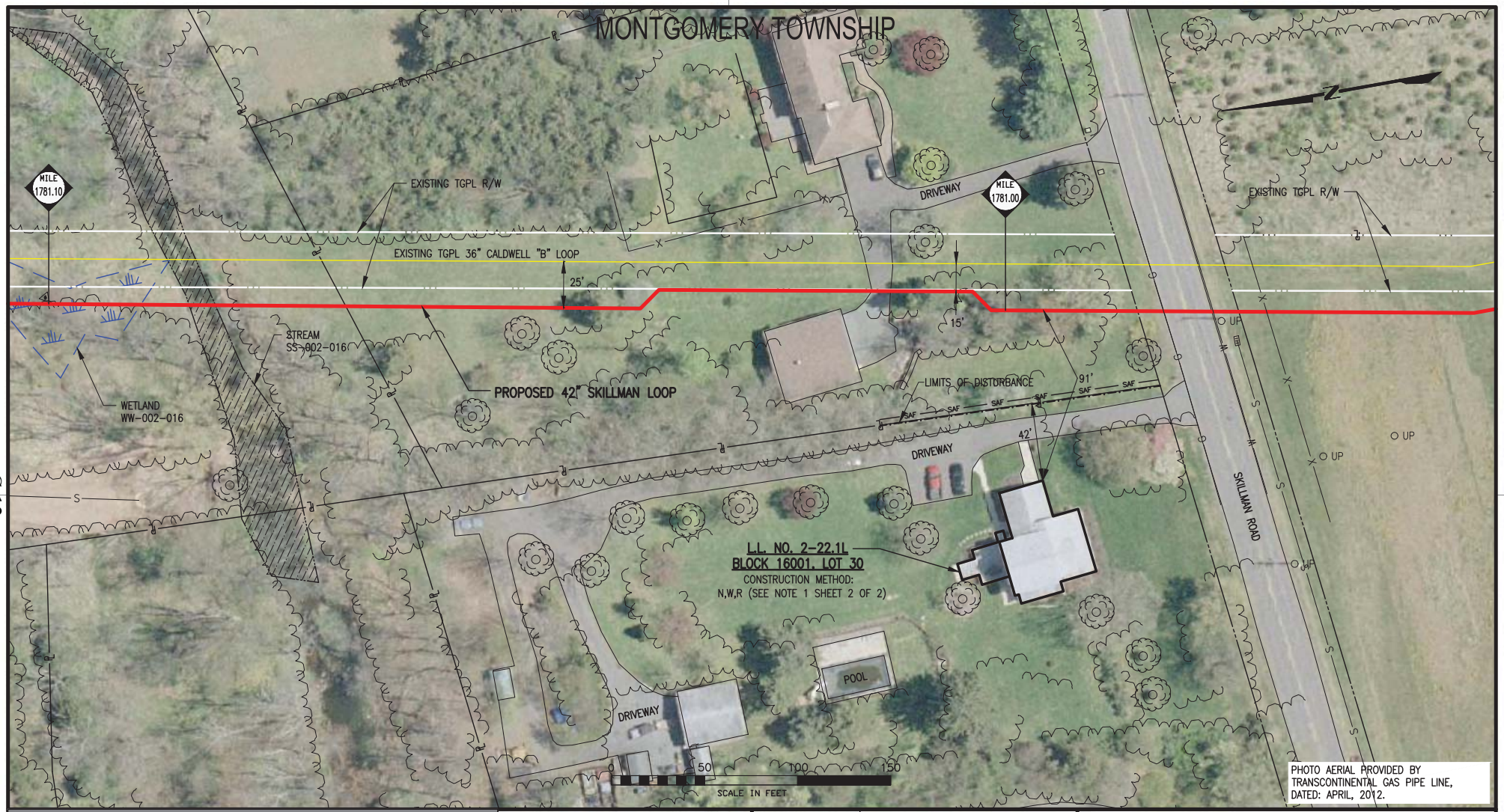
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-20
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1780.29-D	SHEET 1 OF 2
WO: 1129995		1/15/2014 7:25am K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1780.29-D.DWG	HANGLYE

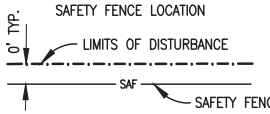


C-12

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

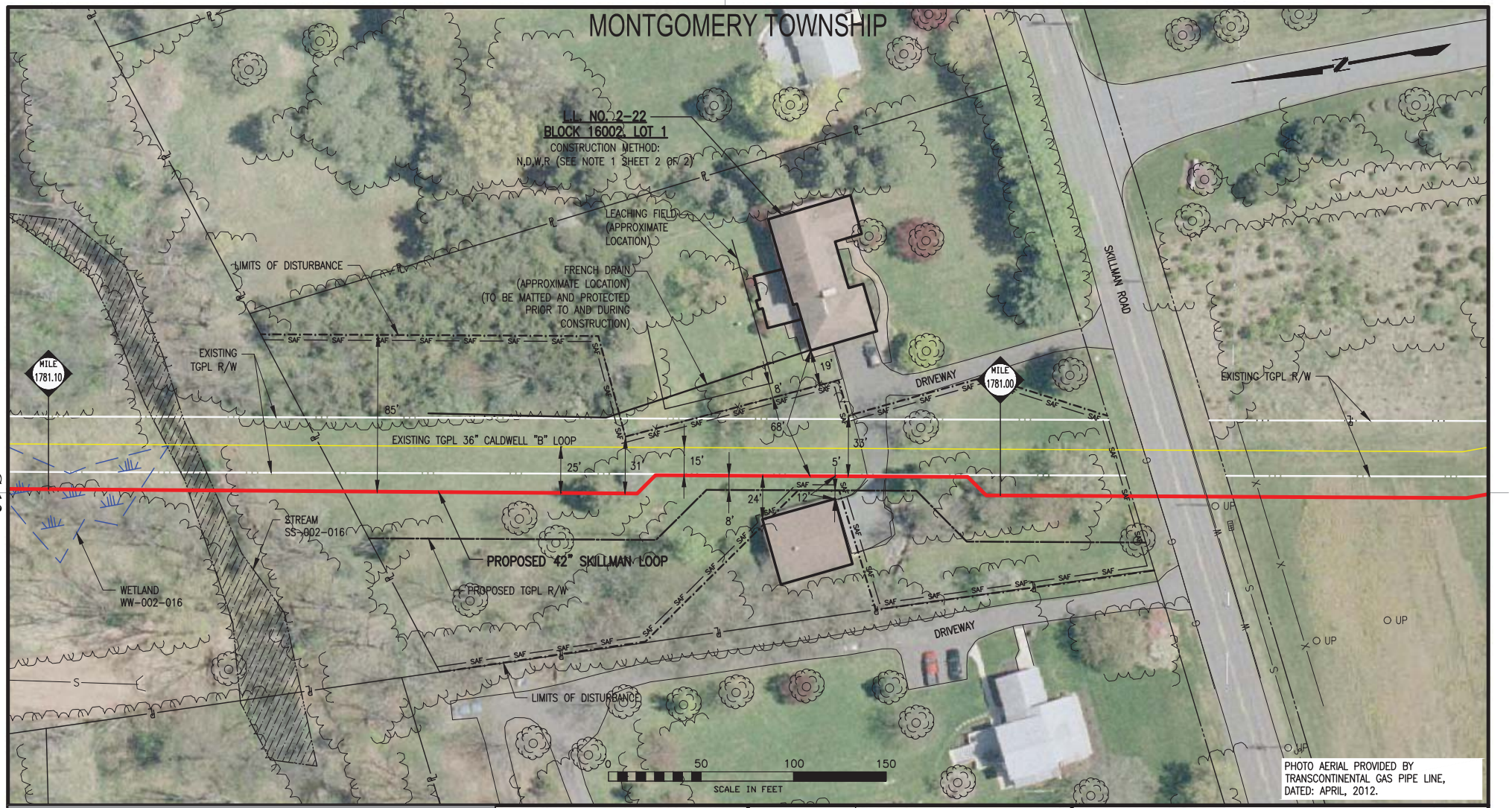
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-22.1L
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.00-D	SHEET 1 OF 2
W.O. 1129995		1/15/2014 7:33:9m K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.00-D.DWG	I:\ENGLIVE

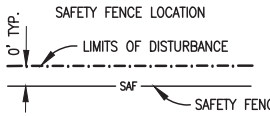


C-13

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

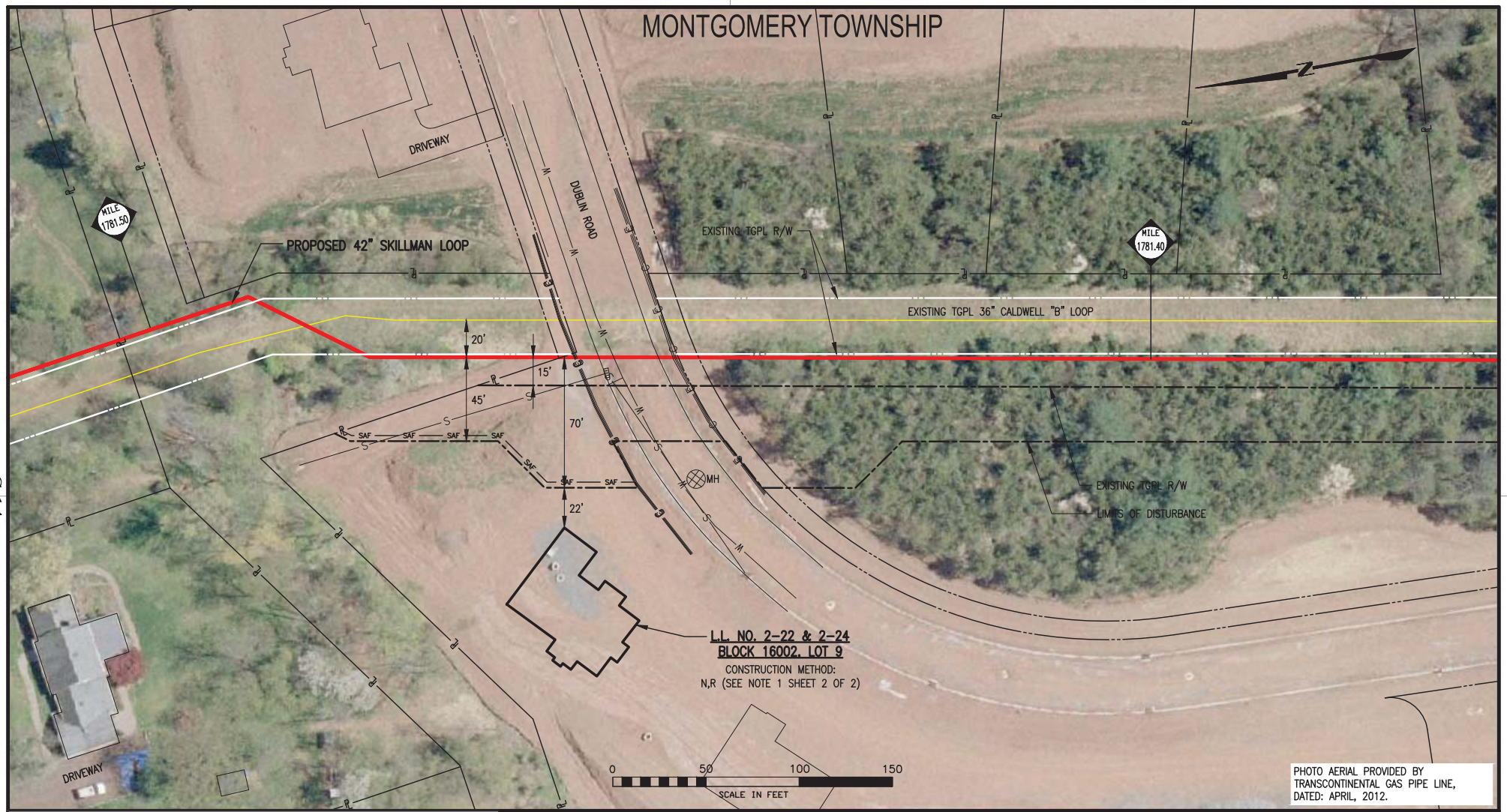
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	ADDED SEPTIC SYSTEM SURVEY	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-22
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.02-D	SHEET 1 OF 2
W.O.: 1129995		1/16/2014 8:04am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.02-D.DWG	

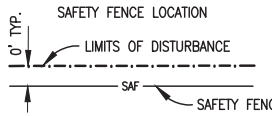


C-14

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	01/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH
1	9/10/13	WGMI	ISSUED FOR FIRM REVIEW	1129995	JD	MJH
2	8/16/13	WGMI	ISSUED FOR FERC FILING	1129995	JD	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-22 & 2-24
SOMERSET COUNTY, NEW JERSEY

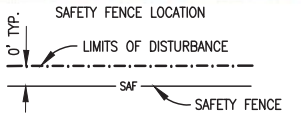
Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.46-D	SHEET 1 OF 2
WO: 1129995		1/24/2014 2:00pm mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.46-D.DWG	

C-15

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

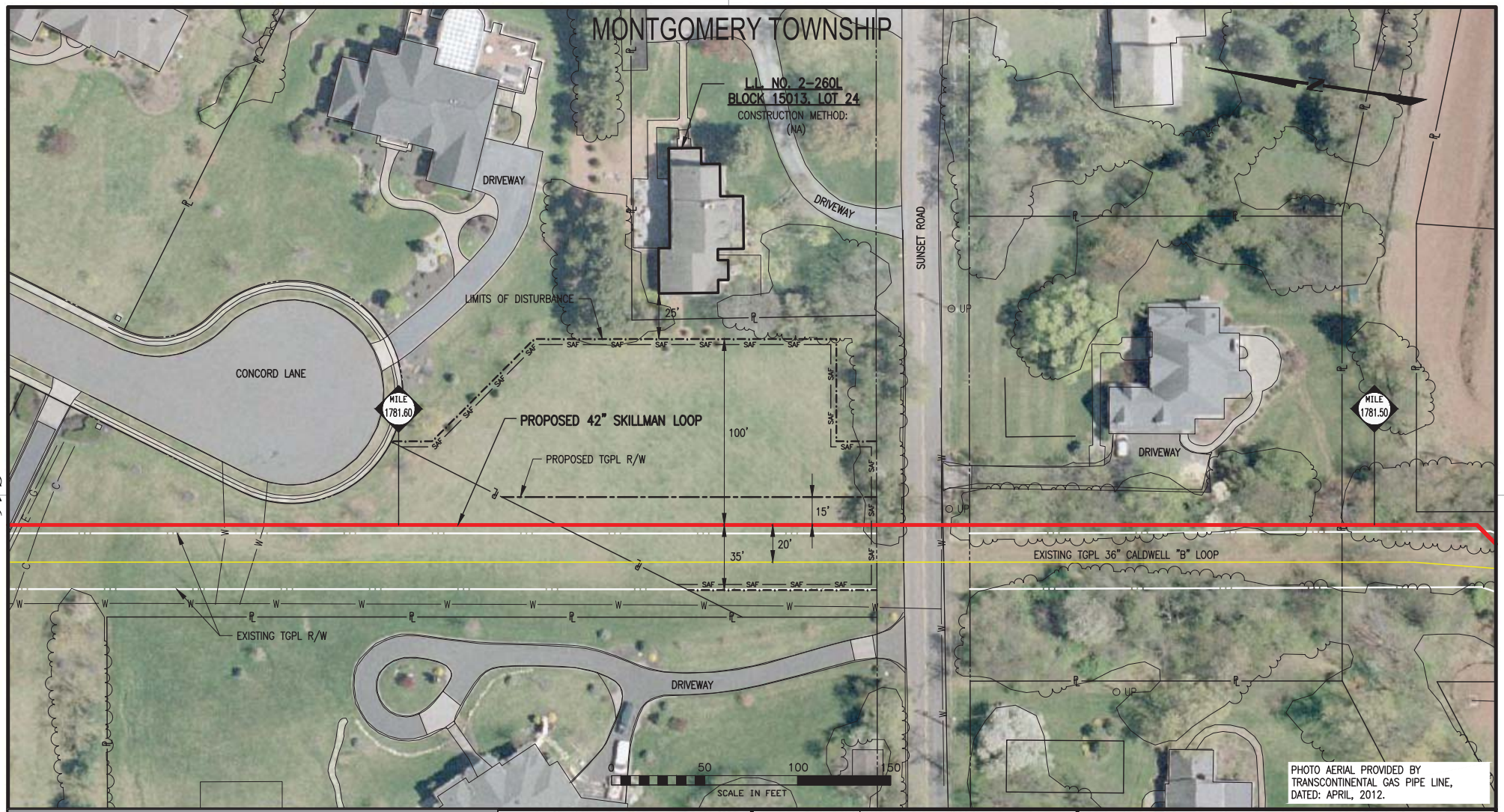
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-24
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.52-D	SHEET 1 OF 2
W.O. 1129995		1/16/2014 9:17am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.52-D.DWG	

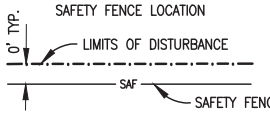


C-16

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

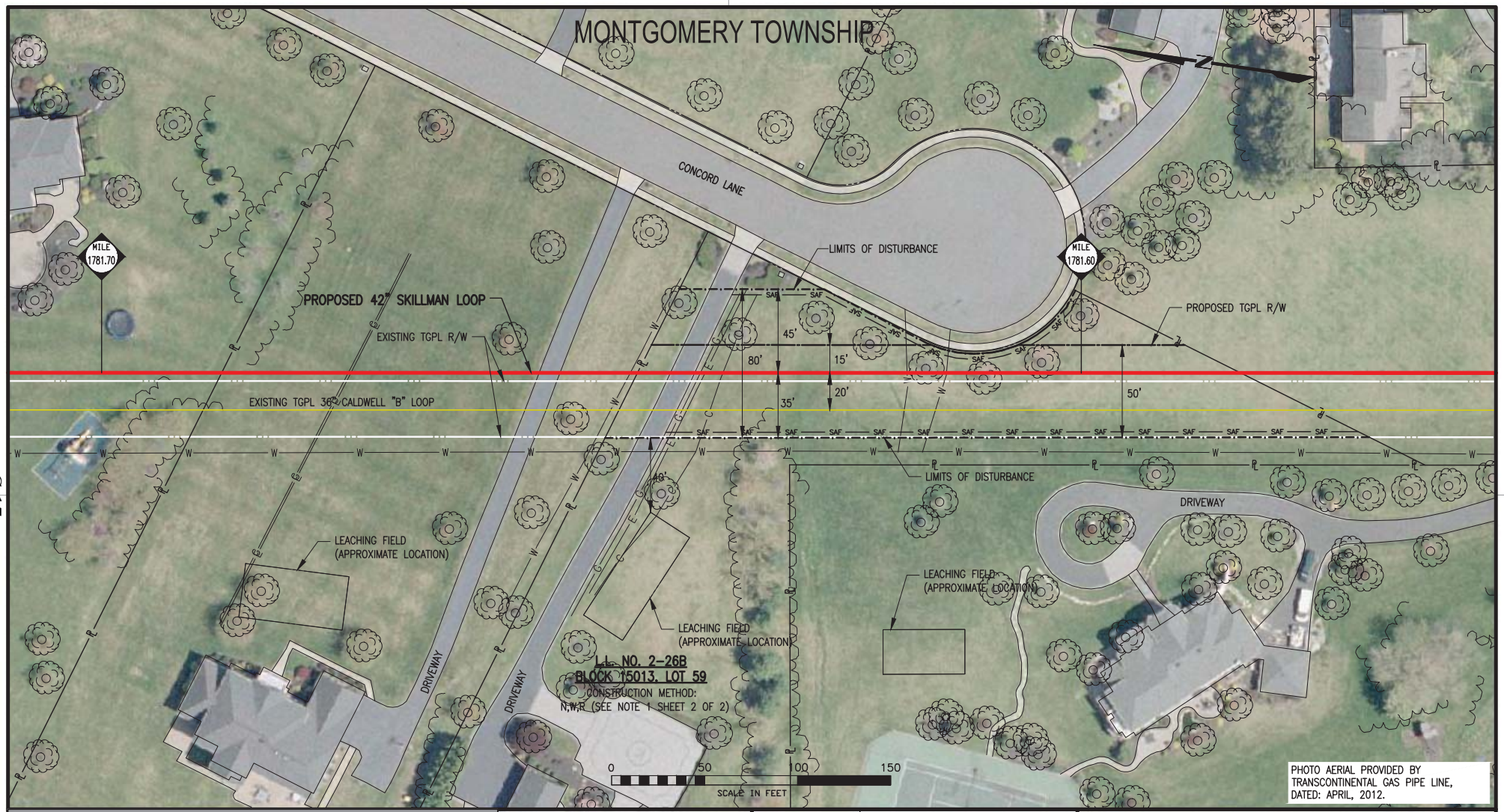
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	REVISED ALIGNMENT AND WORKSPACE	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-260L
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

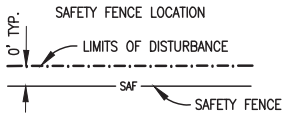
DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.56-D	SHEET 1 OF 2
W.O. 1129995		1/15/2014 7:09am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.56-D.DWG	



C-17

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

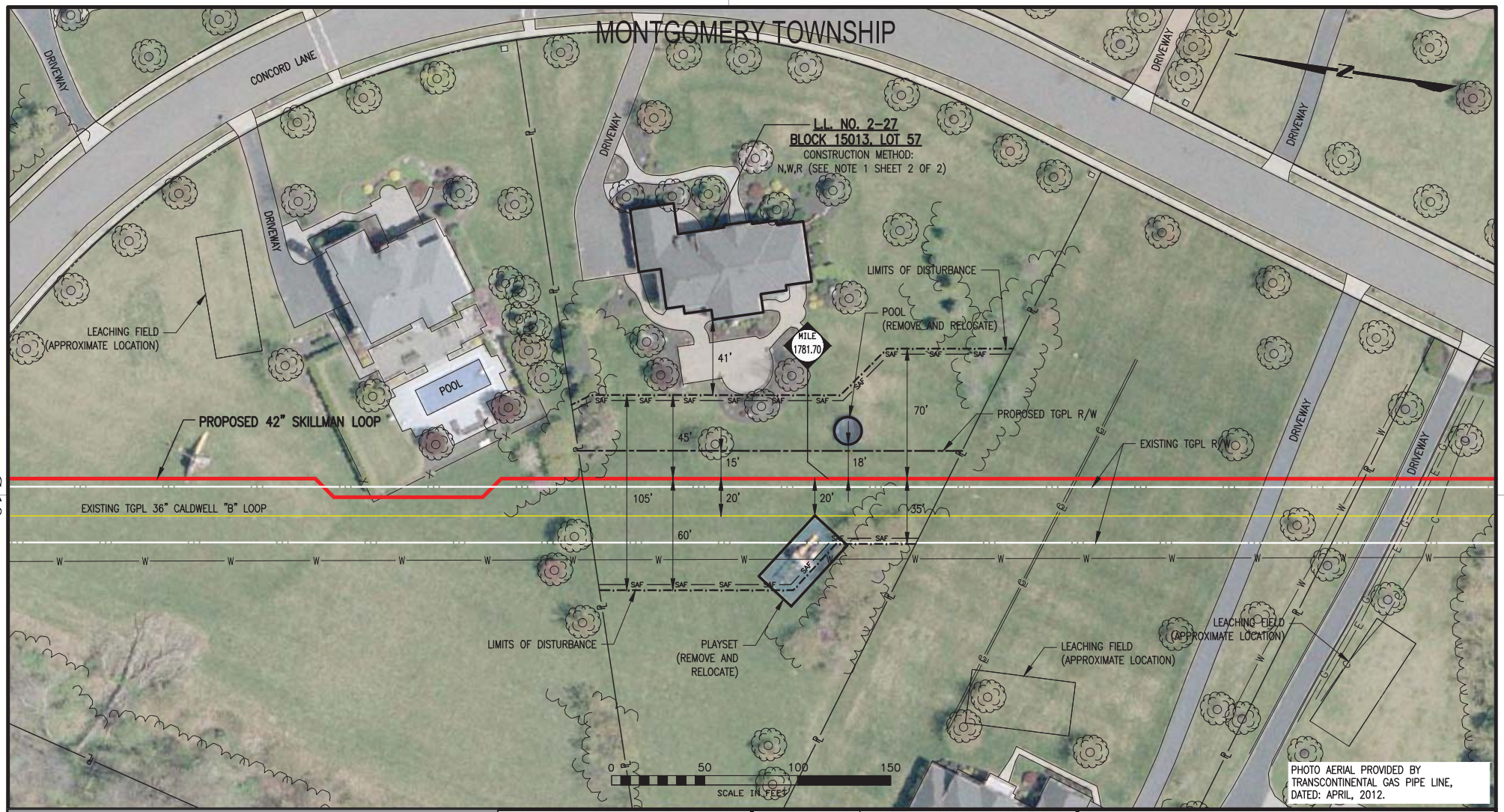
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	REVISED ALIGNMENT AND WORKSPACE	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-26B
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

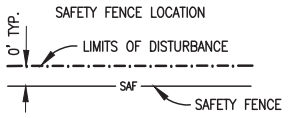
DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.64-D	SHEET 1 OF 2
W.O: 1129995		1/16/2014 9:21am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.64-D.DWG	



C-18

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

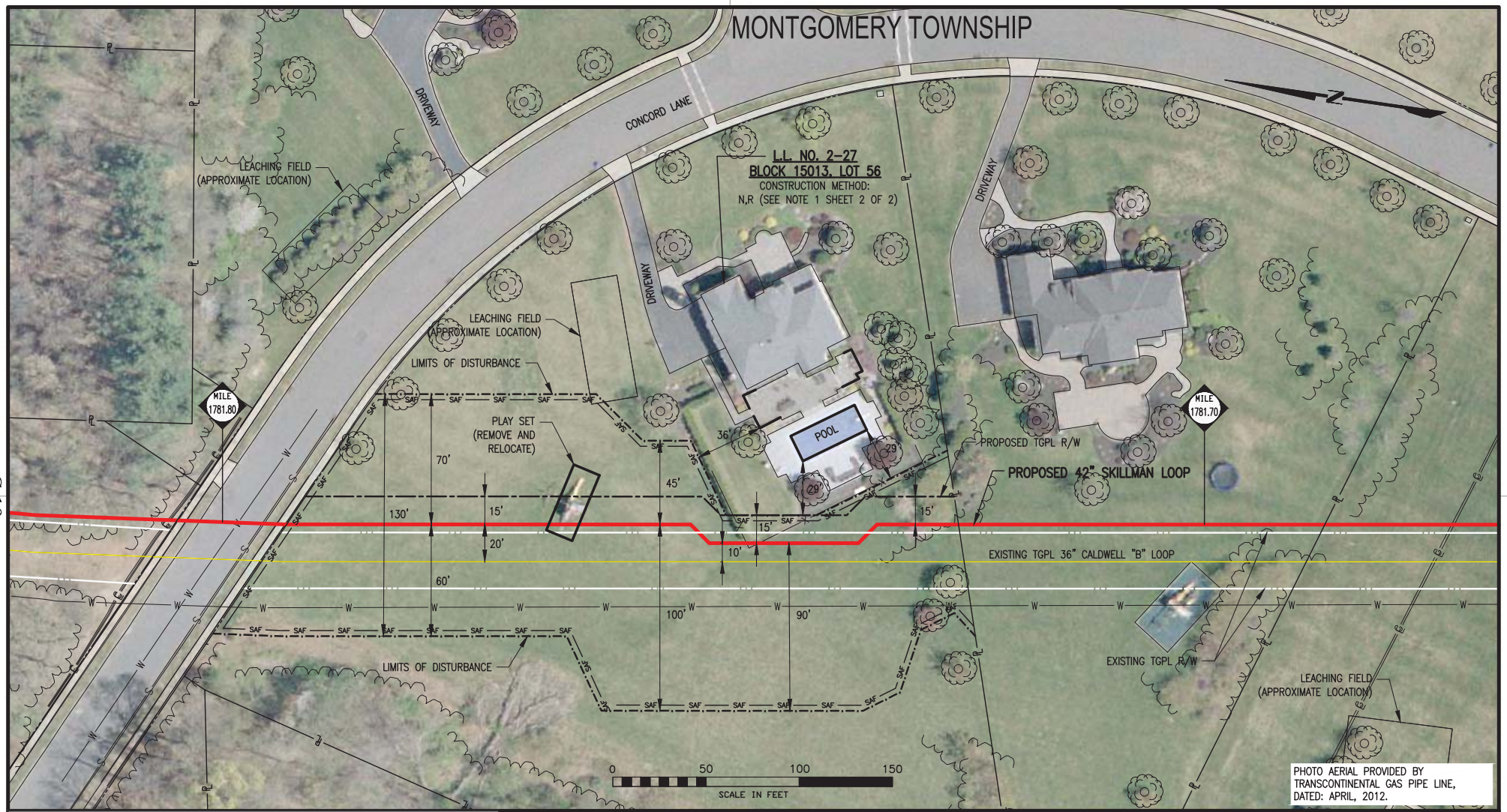
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	REVISED ALIGNMENT AND WORKSPACE	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-27
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

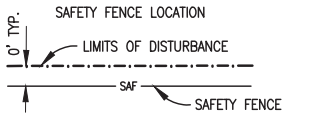
DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.71-D	SHEET 1 OF 2
W.O. 1129995		1/16/2014 mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.71-D.DWG	



C-19

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

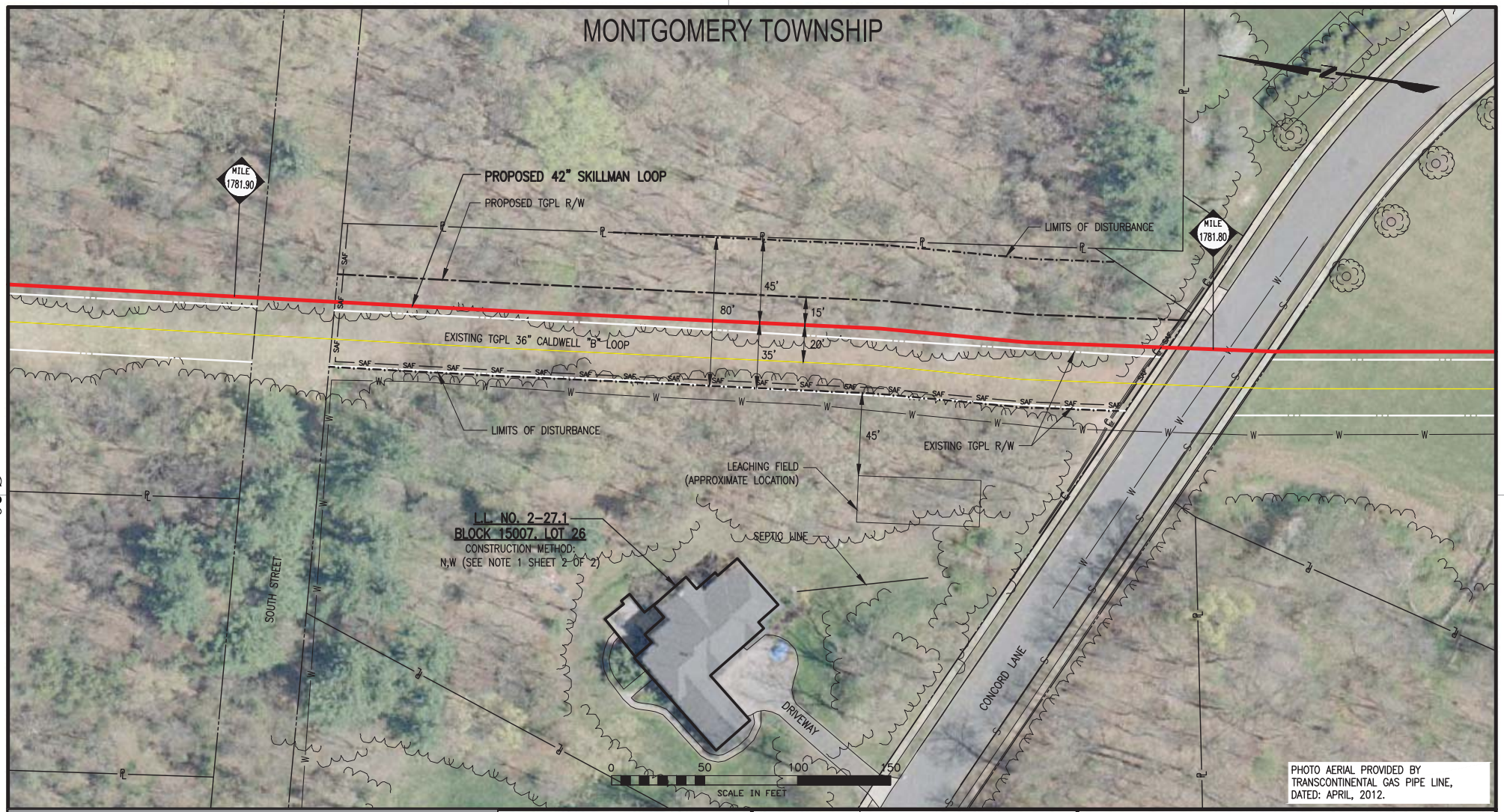
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	REVISED ALIGNMENT AND WORKSPACE	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-27
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.74-D	SHEET 1 OF 2
W.O: 1129995		8:51am 1/15/2014 mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.74-D.DWG	

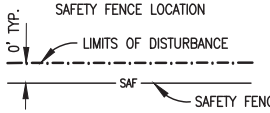


C-20

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	REVISED ALIGNMENT AND WORKSPACE	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-27.1
SOMERSET COUNTY, NEW JERSEY

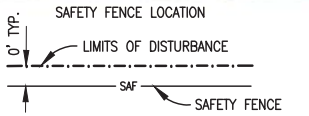
Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1781.85-D	SHEET 1 OF 2
W.O: 1129995		1/28/2014 10:45am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1781.85-D.DWG	

C-21

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

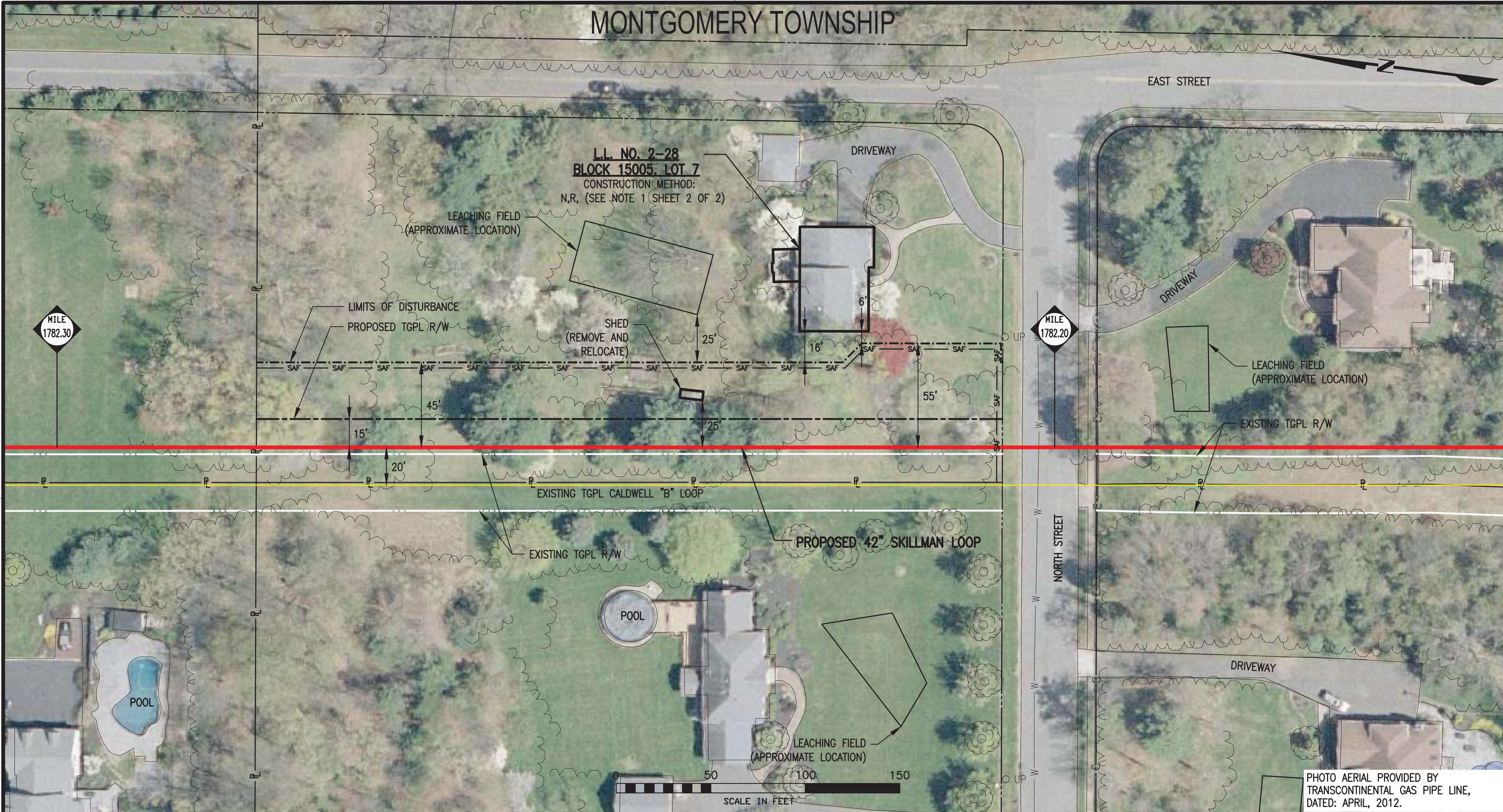
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	ADDED SEPTIC SYSTEM SURVEY	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-27.2
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1782.18-D	SHEET 1 OF 2
W.O: 1129995		1/16/2014 8:22am mtho K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1782.18-D.DWG	



LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE

SAFETY FENCE LOCATION

0' TYP.

LIMITS OF DISTURBANCE

SAF

SAFETY FENCE

THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

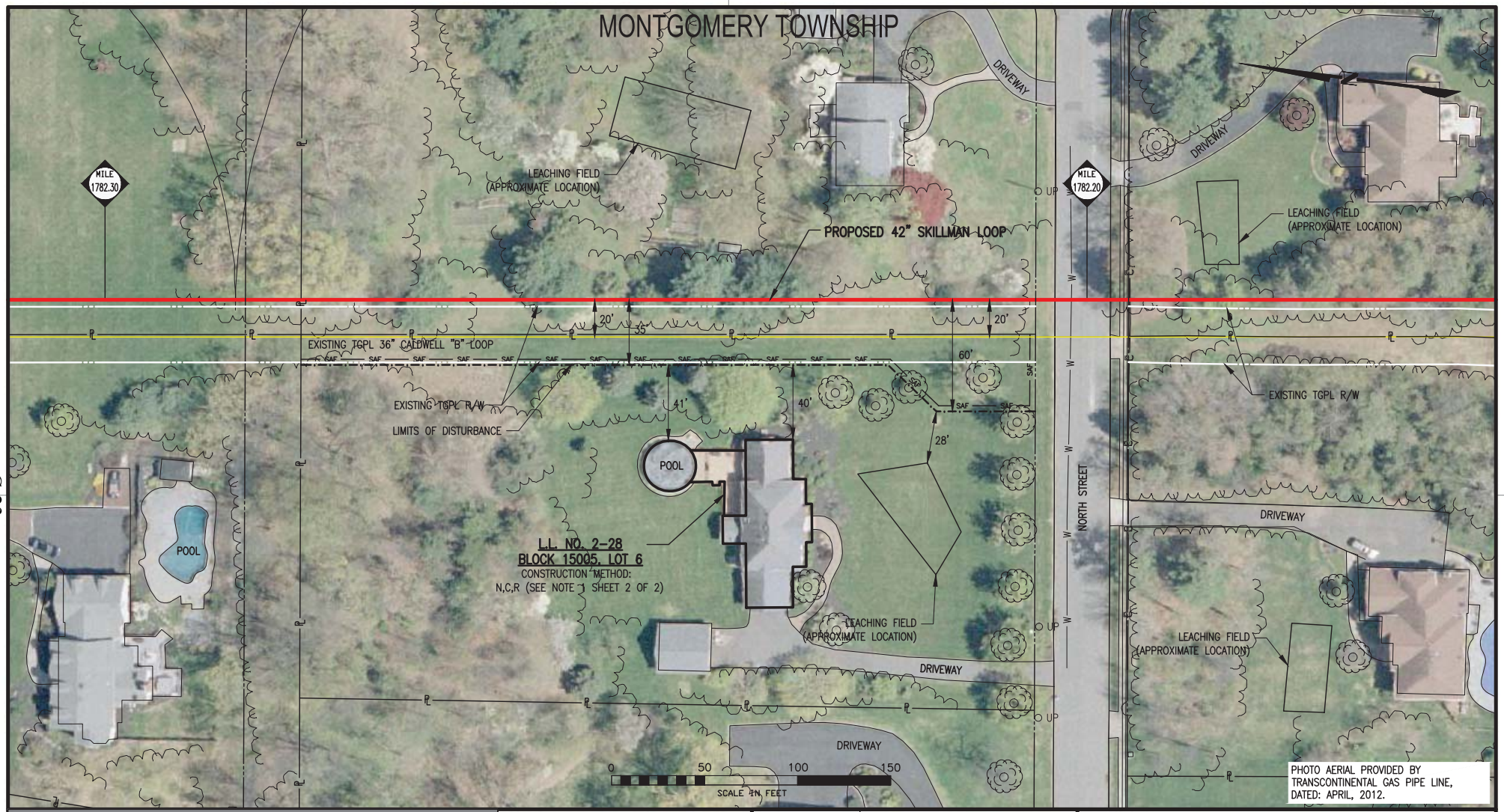
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	ADDED SEPTIC SYSTEM SURVEY	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-28
SOMERSET COUNTY, NEW JERSEY

Williams. GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1782.21-D	SHEET 1 OF 2
WO: 1129995		8:32am 1/15/2014 14NGUYE K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1782.21-D.DWG	

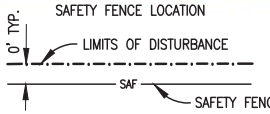


C-23

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

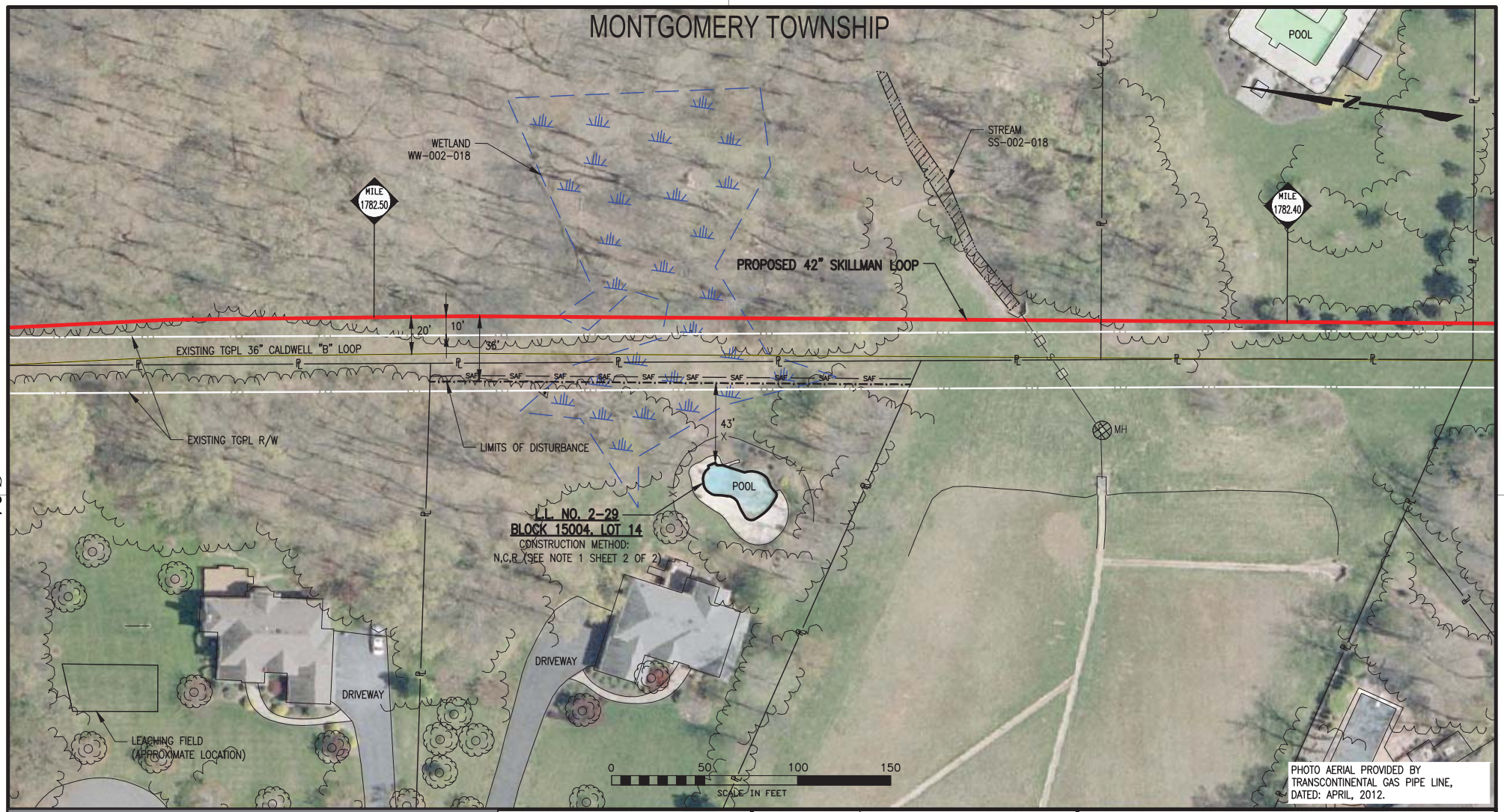
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-28
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	11/01/13	WGMI	ADDED SEPTIC SYSTEM SURVEY	1129995	BB	MJH
4	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

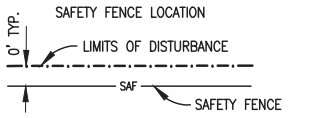
DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1782.23-D	SHEET 1 OF 2
W.O.: 1129995		1/15/2014 14NGUYE K:\20347 - Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1782.23-D.DWG	



C-24

LEGEND

- PROPOSED 42" SKILLMAN LOOP
- EXISTING TGPL 36" CALDWELL "B" LOOP
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGMI	ISSUED FOR SUBMITTAL	1129995	BB	MJH
1	9/10/13	WGMI	ISSUED FOR FINAL REVIEW	1129995	BB	MJH
2	9/18/13	WGMI	ISSUED FOR FERC FILING	1129995	BB	MJH
3	1/17/14	WGMI	ISSUED FOR SUPPLEMENTAL FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" SKILLMAN LOOP
FOR PROPERTY OF L.L. NO. 2-29
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/1782.47-D	SHEET 1 OF 2
W.O. 1129995		1/15/2014 8:44am tANGUYE K:\20347 – Skillman Loop\Mapping\Property Plats\RCP\25-06-80_1782.47-D.DWG	

Transcontinental Gas Pipe Line Company, LLC.

LEIDY SOUTHEAST PROJECT

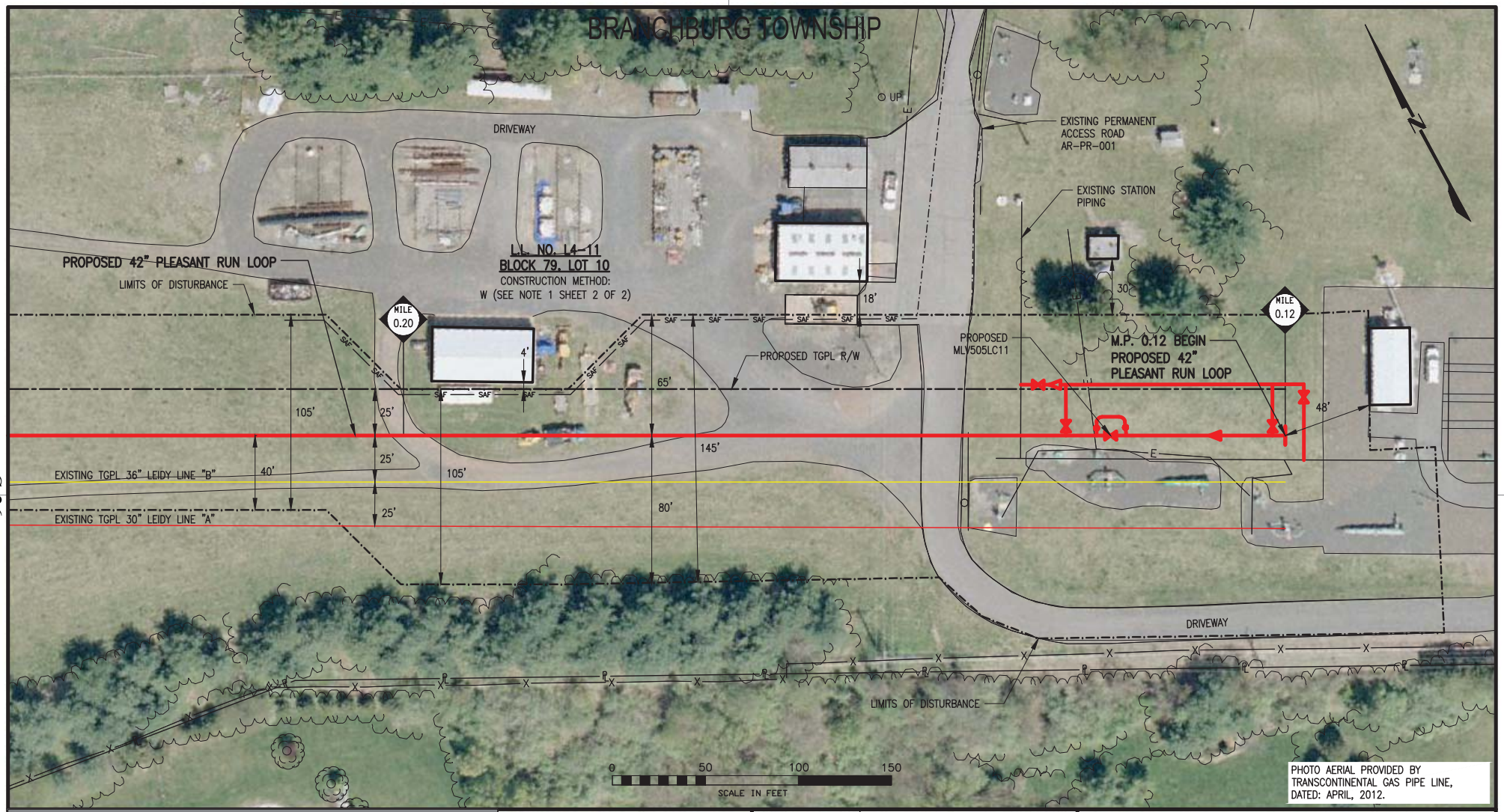
PROPOSED 42" PLEASANT RUN LOOP

SOMERSET & HUNTERDON COUNTIES, NEW JERSEY

RESIDENTIAL CONSTRUCTION PLAN

6.92 MI. 42" PIPELINE – M.P. 0.12 TO M.P. 6.91

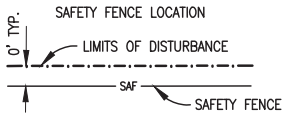
DATE: 1-17-2014



C-26

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

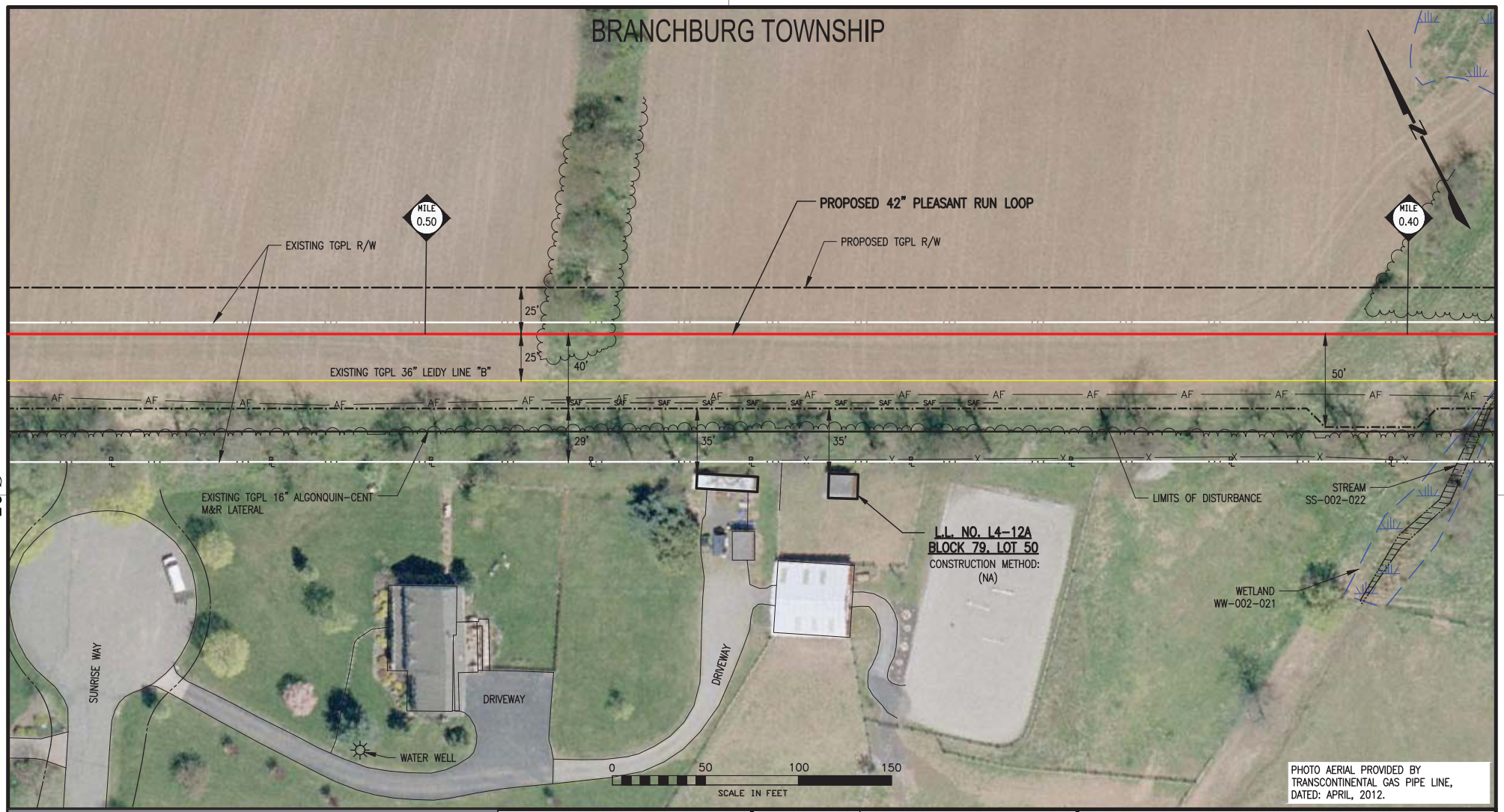
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L4-11
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/00.18-C	SHEET 1 OF 2
W.O. 1129993		1/15/2014 8:53am wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_00.18-C.dwg	

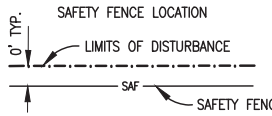


C-27

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

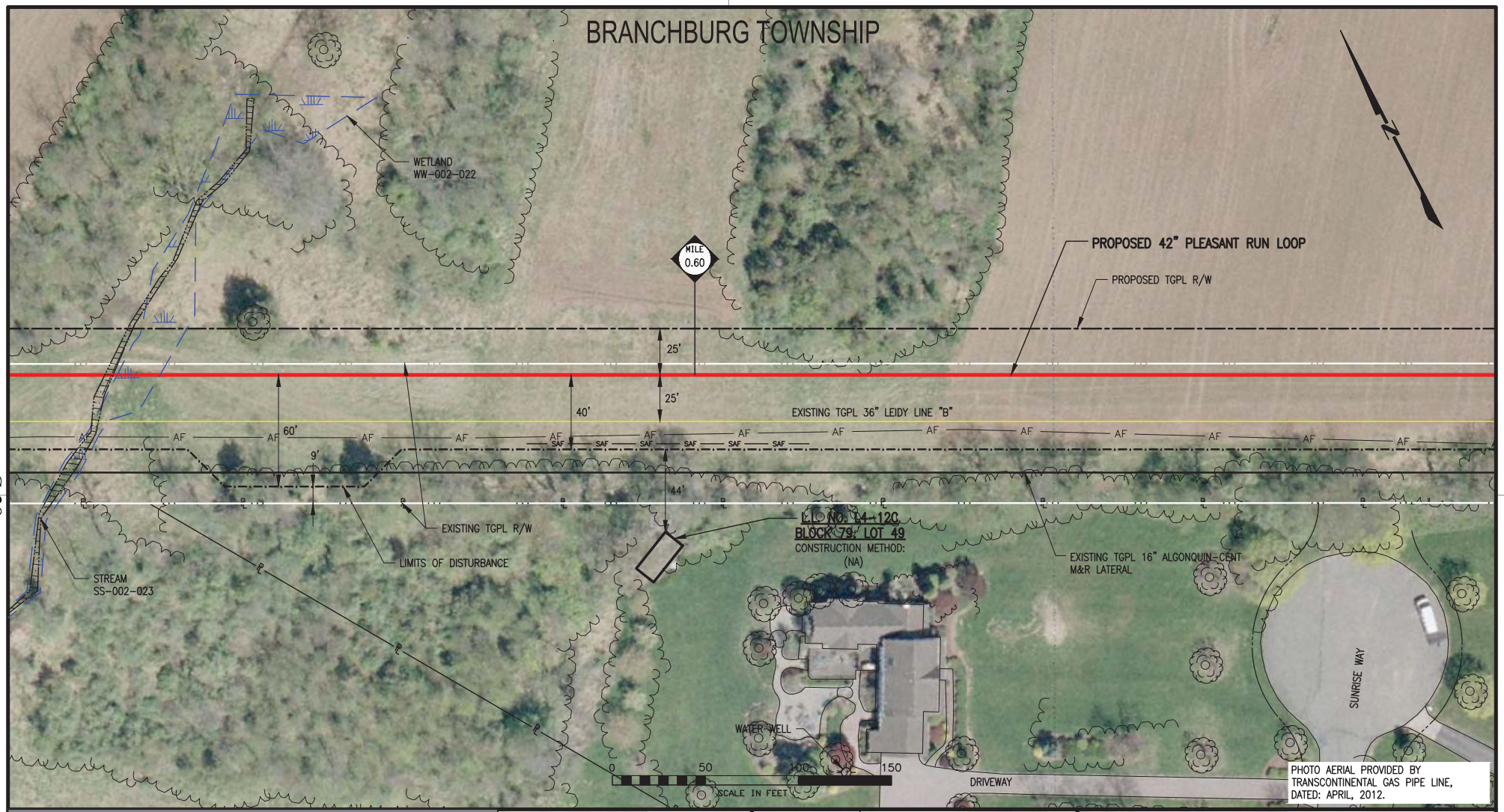
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L4-12A
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

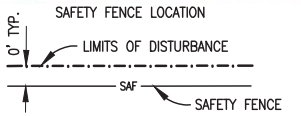
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/00.46-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 8:56am wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_00.46-C.dwg	



C-28

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

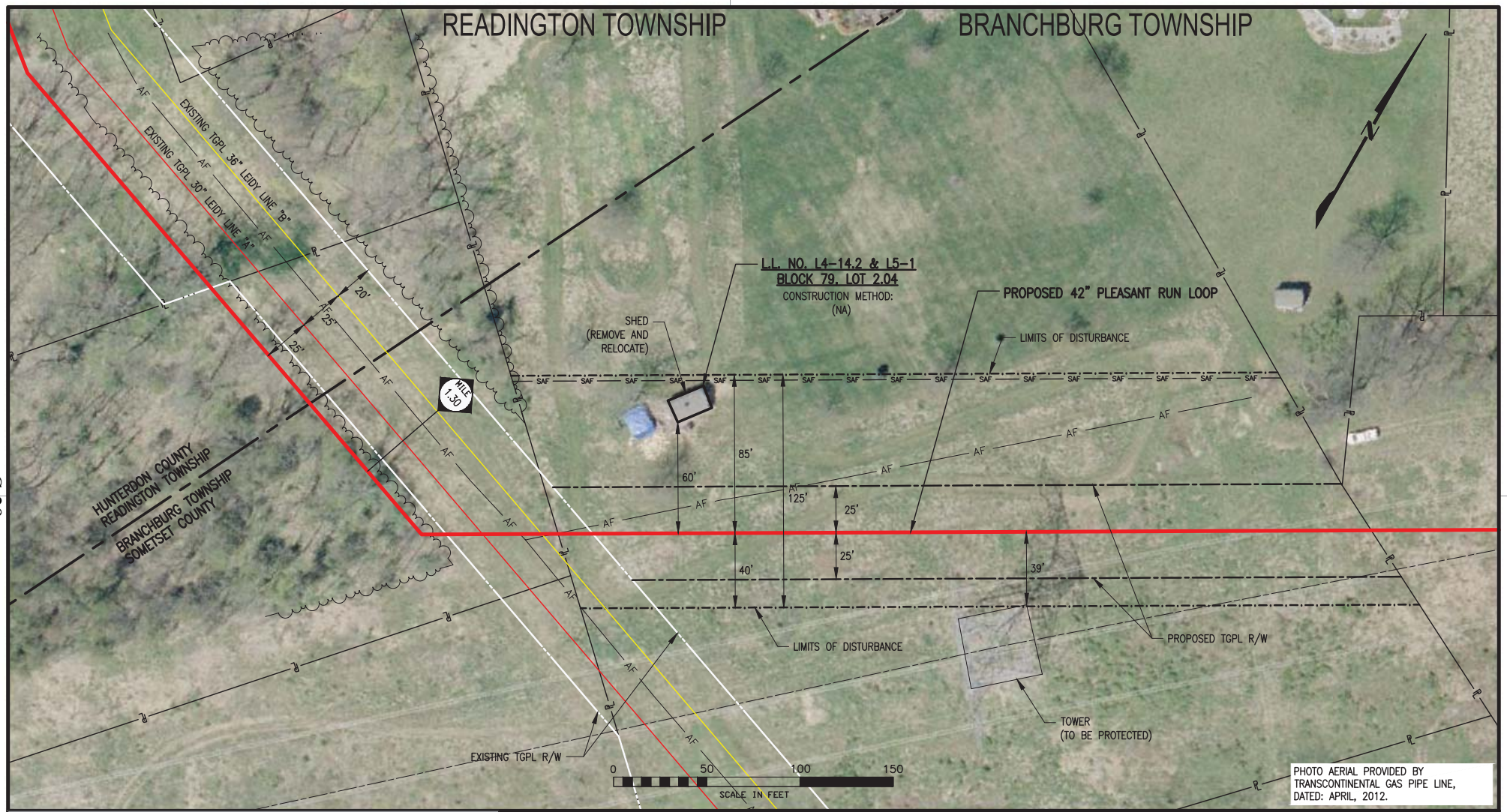
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L4-12C
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/00.60-C	SHEET 1 OF 2
W.O. 1129993		1/15/2014 8:59am wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_00.60-C.dwg	

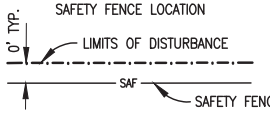


C-29

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L4-14.2 & L5-1
SOMERSET COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/01.28-C	SHEET 1 OF 2
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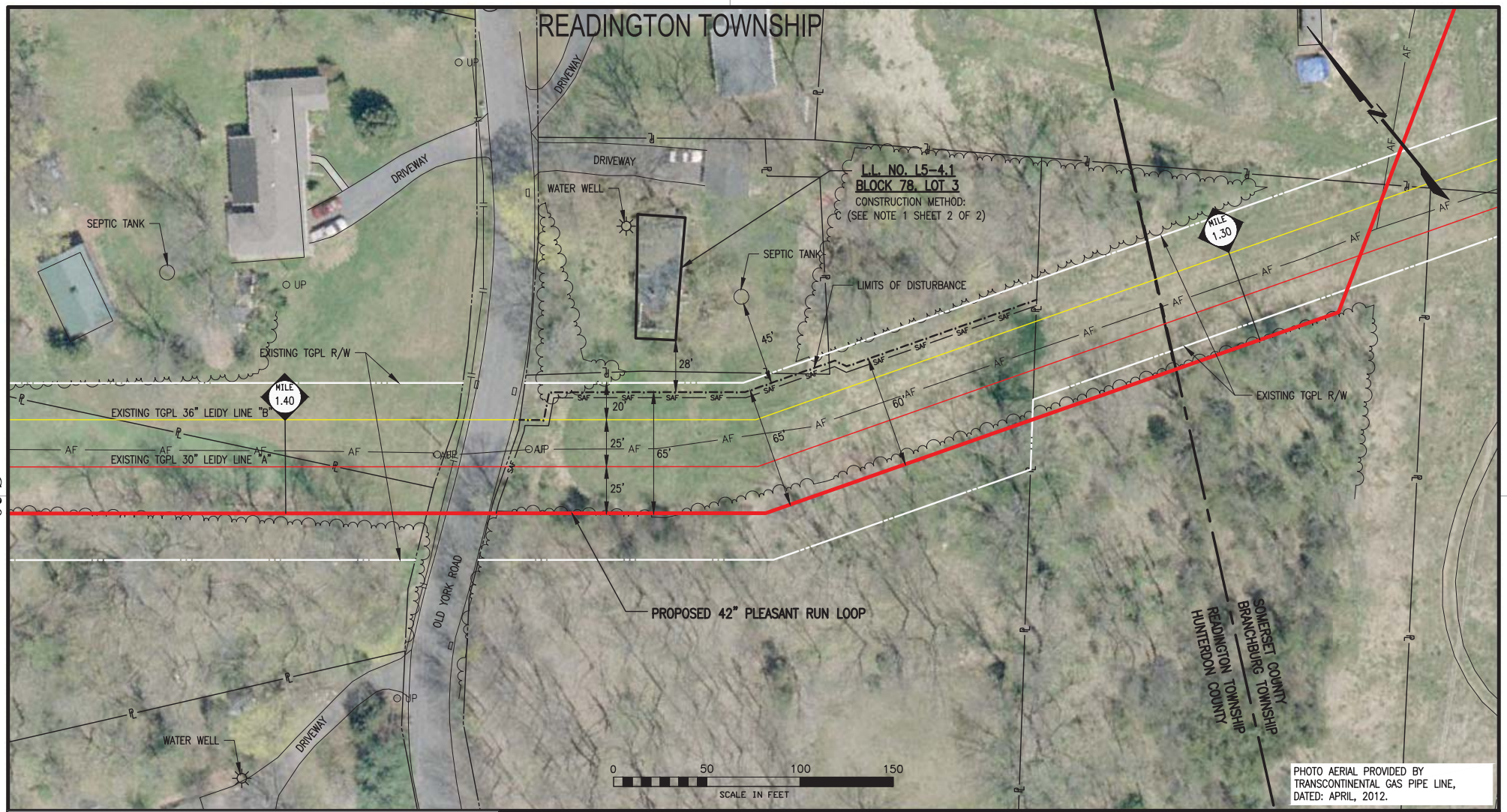
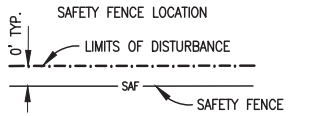


C-30

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-4.1
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/01.36-C	SHEET 1 OF 2
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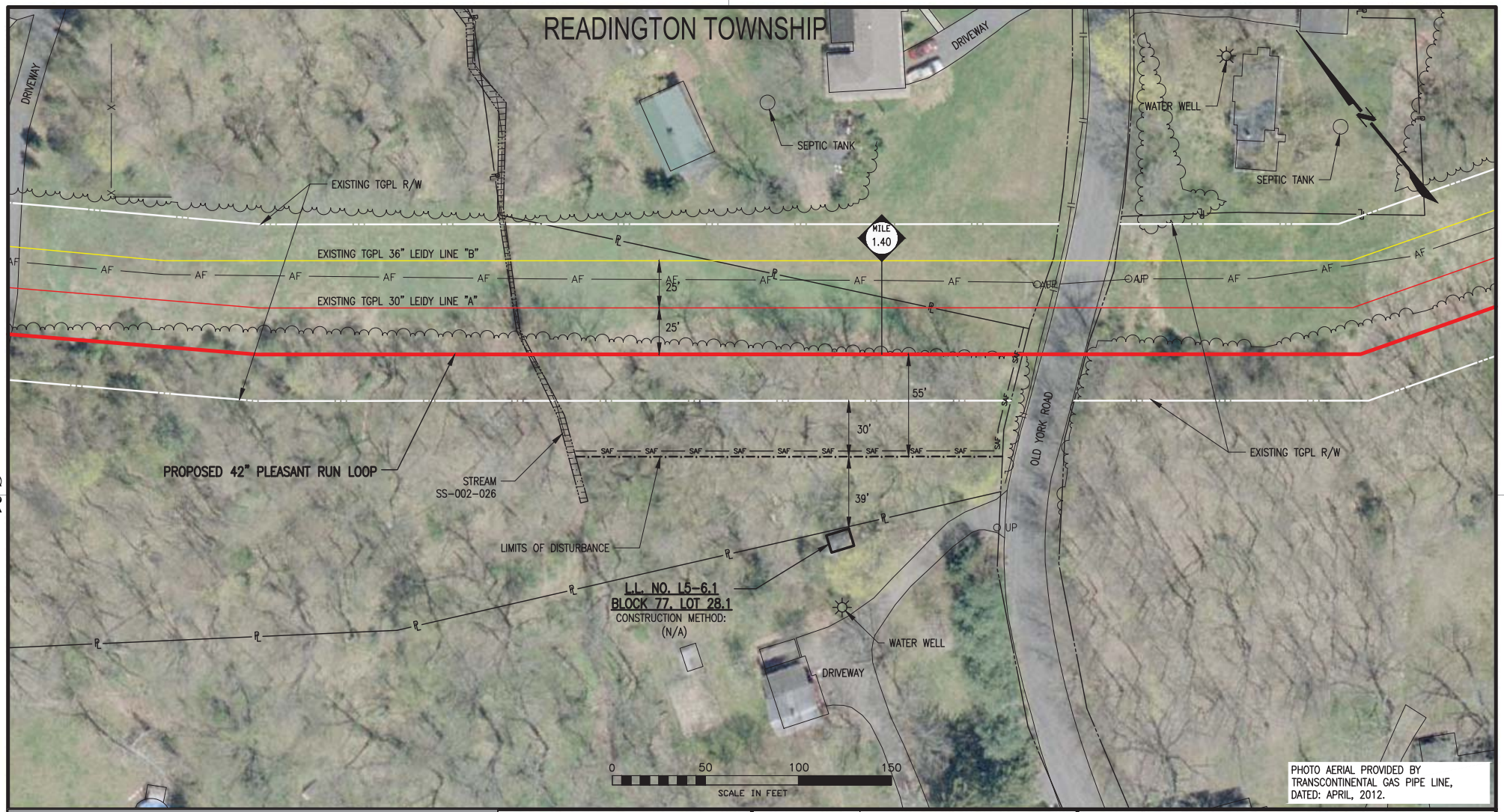
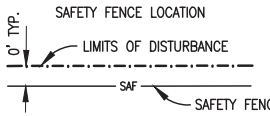


C-31

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

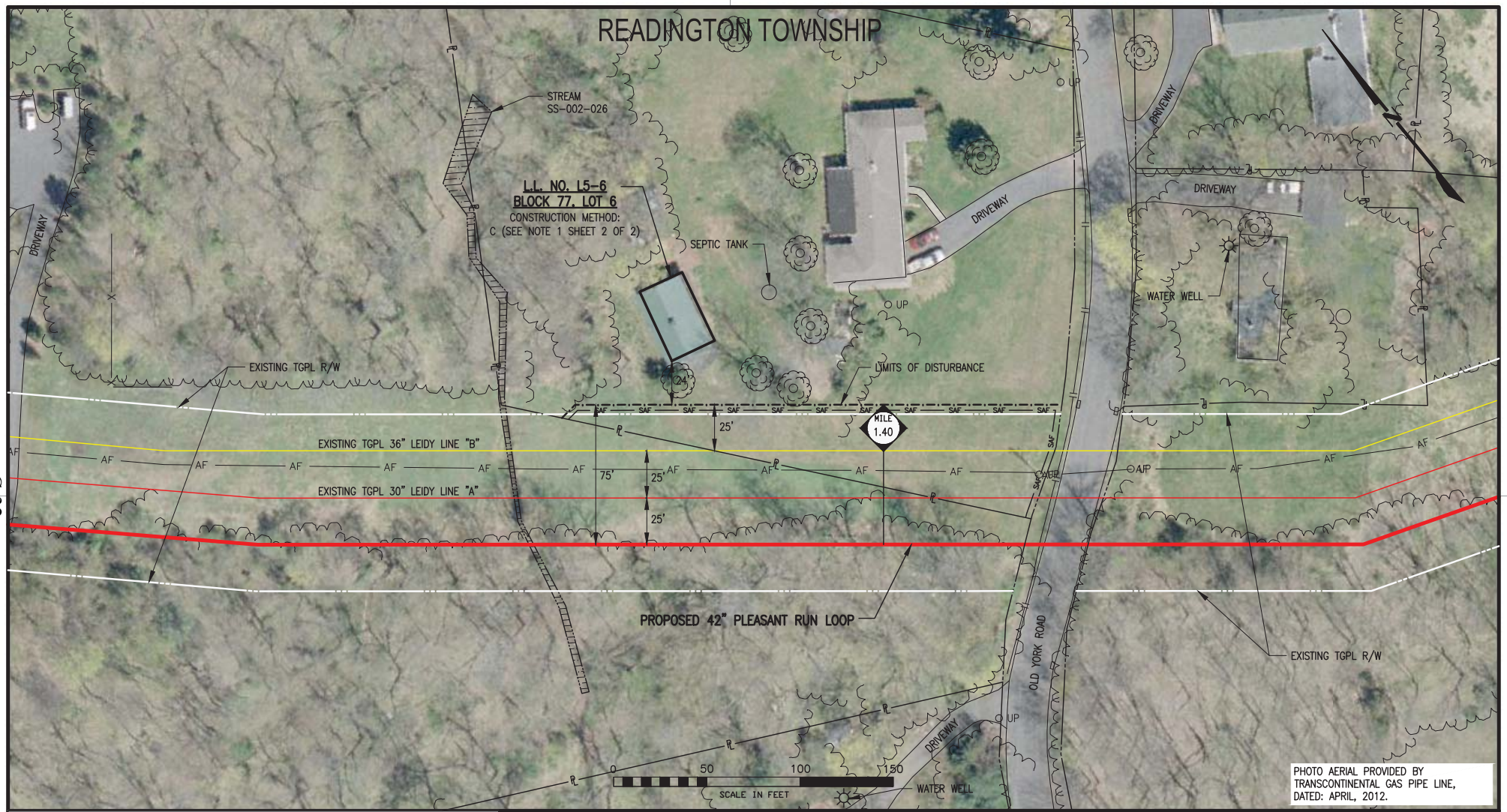
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-6.1
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/01.41-C	SHEET 1 OF 2
W.O.: 1129993		1/16/2014 10:12pm mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_01.41-C.dwg	

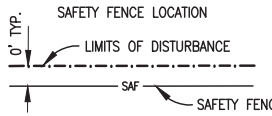


C-32

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-6
HUNTERDON COUNTY, NEW JERSEY

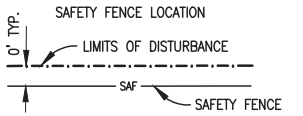
Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/01.42-C	SHEET 1 OF 2
W.O.: 1129993		1/16/2014 10:15am mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_01.42-C.dwg	

C-33

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

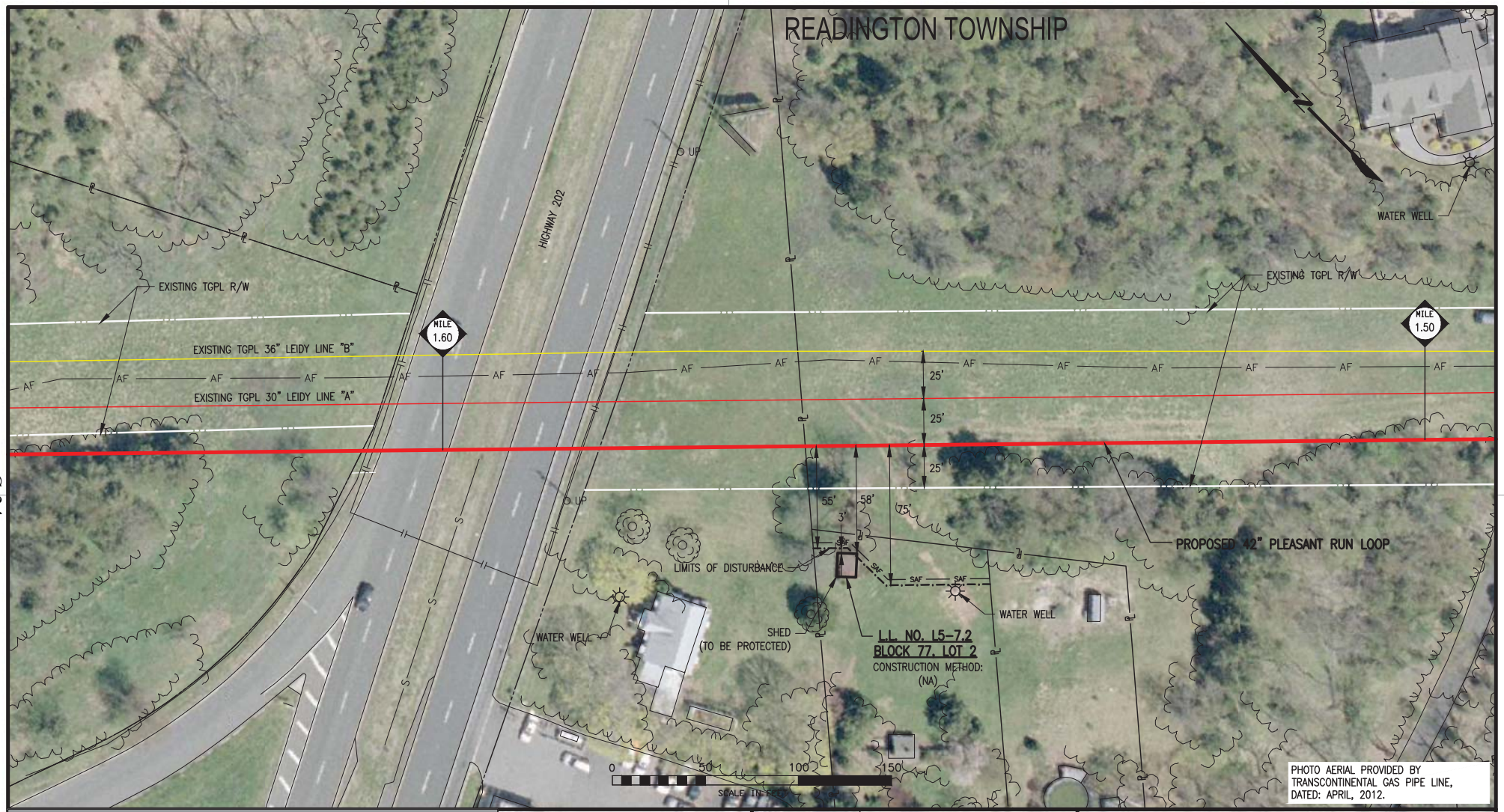
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-7.3
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

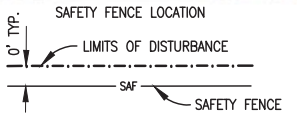
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/01.53-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 9:22am wtland K:\20346 – Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_01.53-C.dwg	



C-34

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

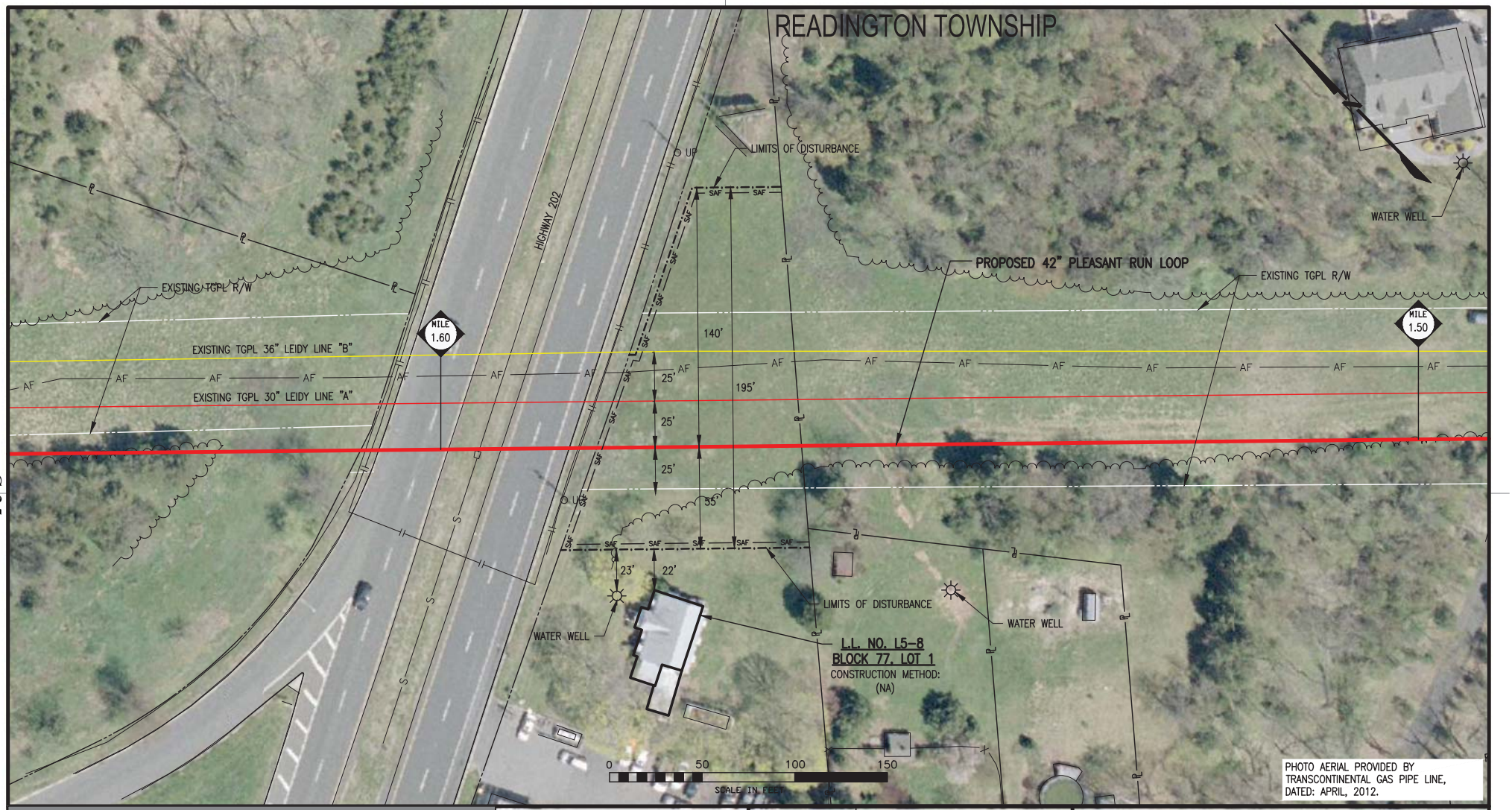
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-7.2
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/01.55-C	SHEET 1 OF 2
W.O.: 1129993		1/16/2014 10:47am mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_01.55-C.dwg	

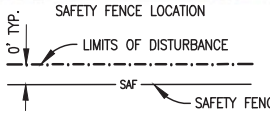


C-35

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

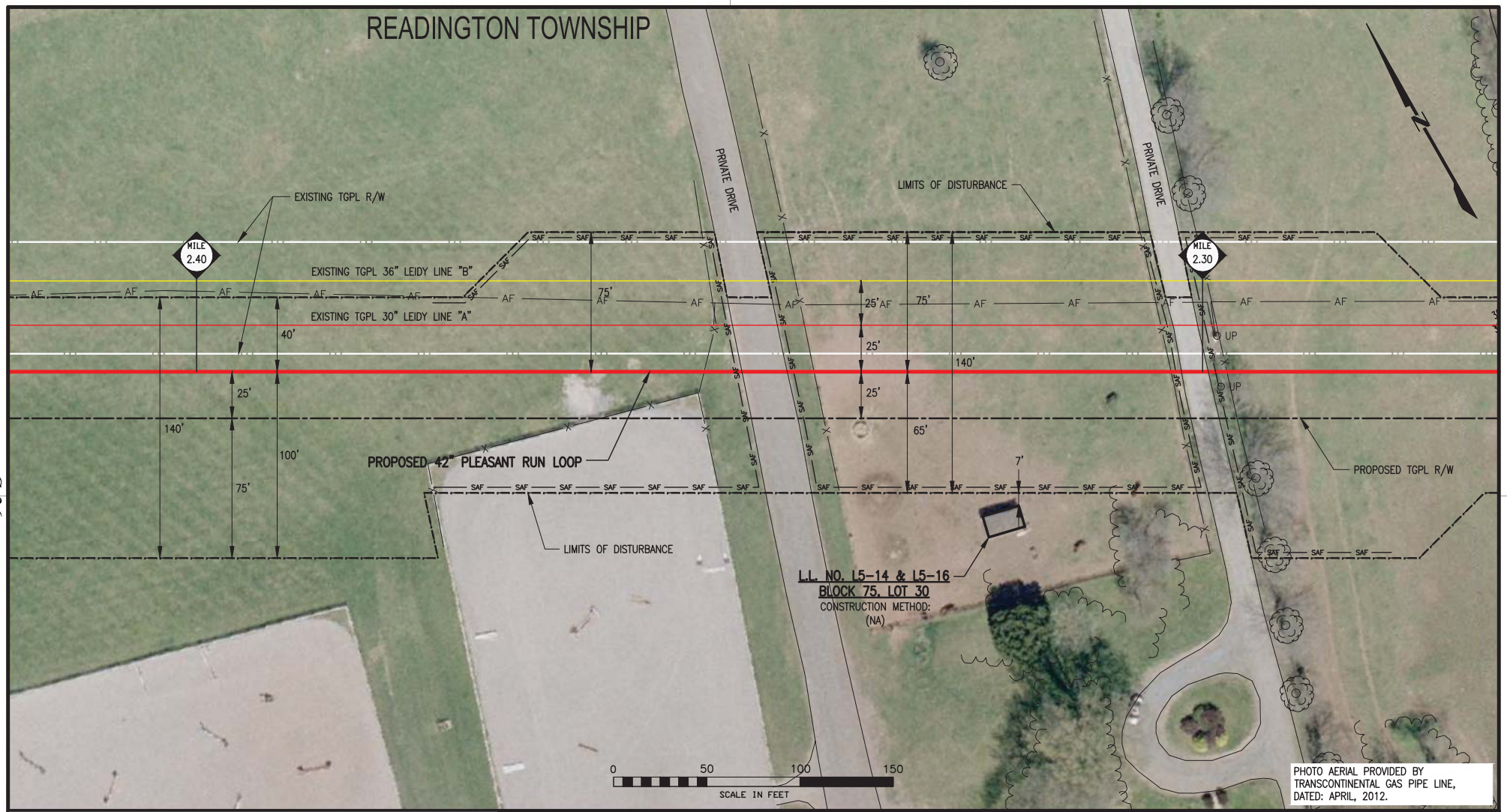
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-8
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

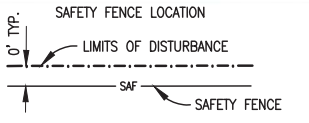
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/01.58-C	SHEET 1 OF 2
W.O. 1129993		1/15/2014 9:33am wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RGP\25-06-80_01.58-C.dwg	



C-36

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

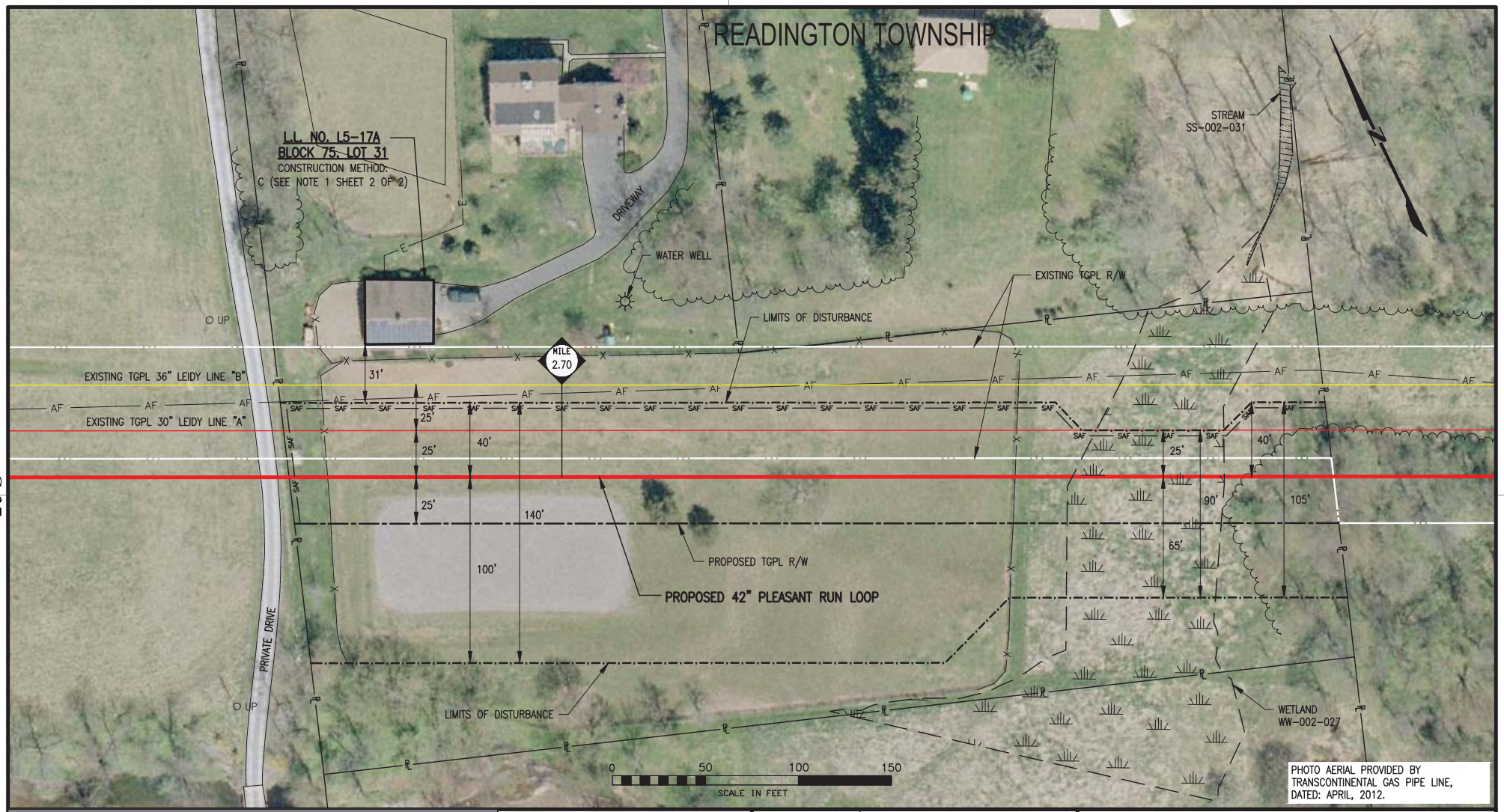
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-14 & L5-16
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

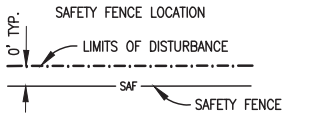
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/02.31-C	SHEET 1 OF 2
W.O: 1129993		1/16/2014 10:49am mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_02.31-C.dwg	



C-37

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

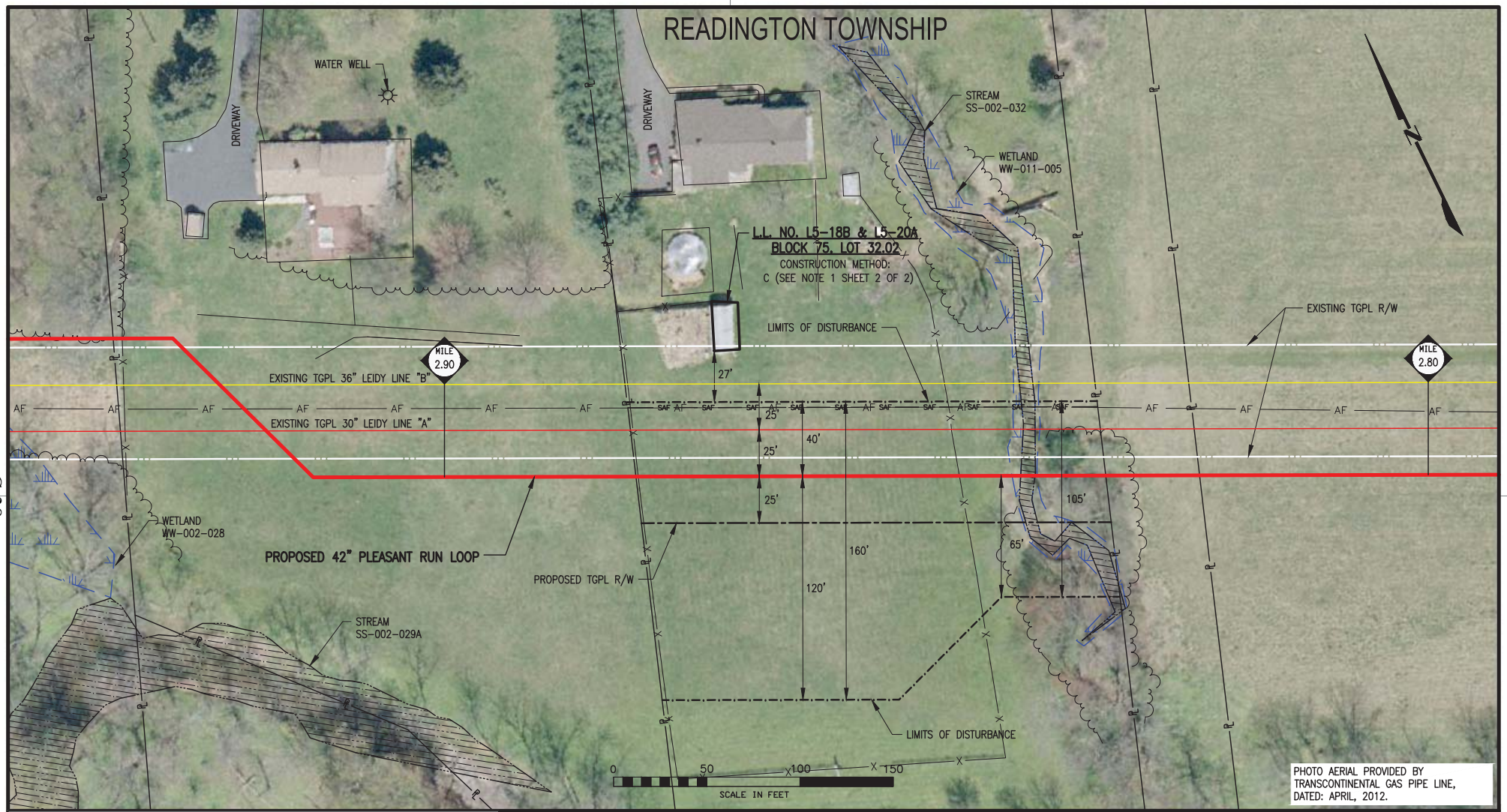
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-17A
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/02.71-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 9:38cm wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_02.71-C.dwg	

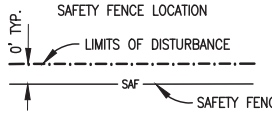


C-38

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

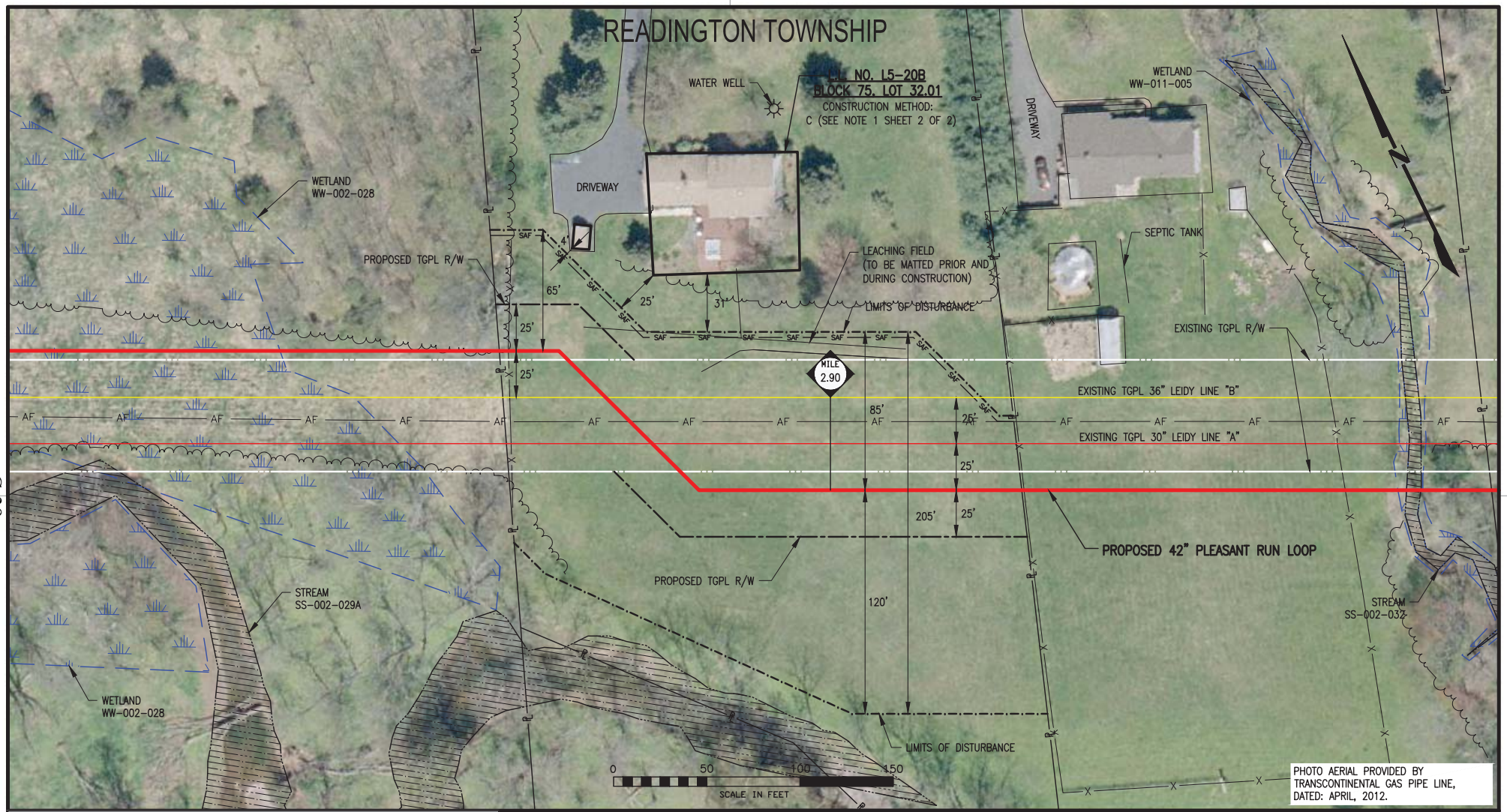
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-18B & L5-20A
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

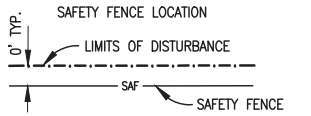
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/02.87-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_02.87-C.dwg	



C-39

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

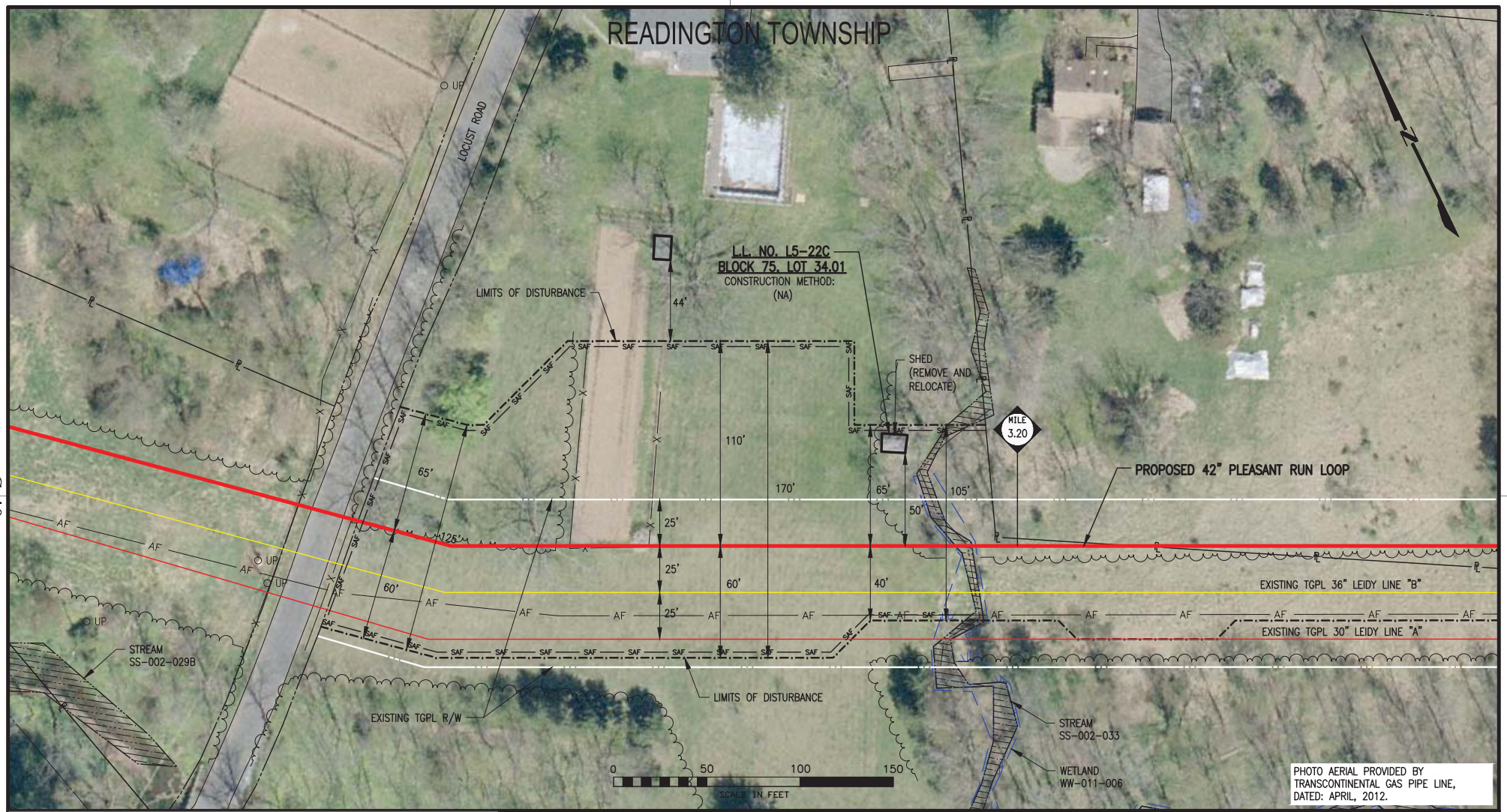
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	11/01/13	WGM	ADDED SEPTIC SYSTEM SURVEY	1129993	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-20B
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

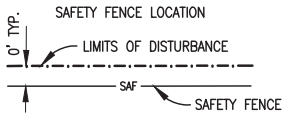
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/02.91-C	SHEET 1 OF 2
W.O. 1129993		1/16/2014 12:48pm mlho K:\20346 – Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_02.91-C.dwg	



C-40

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

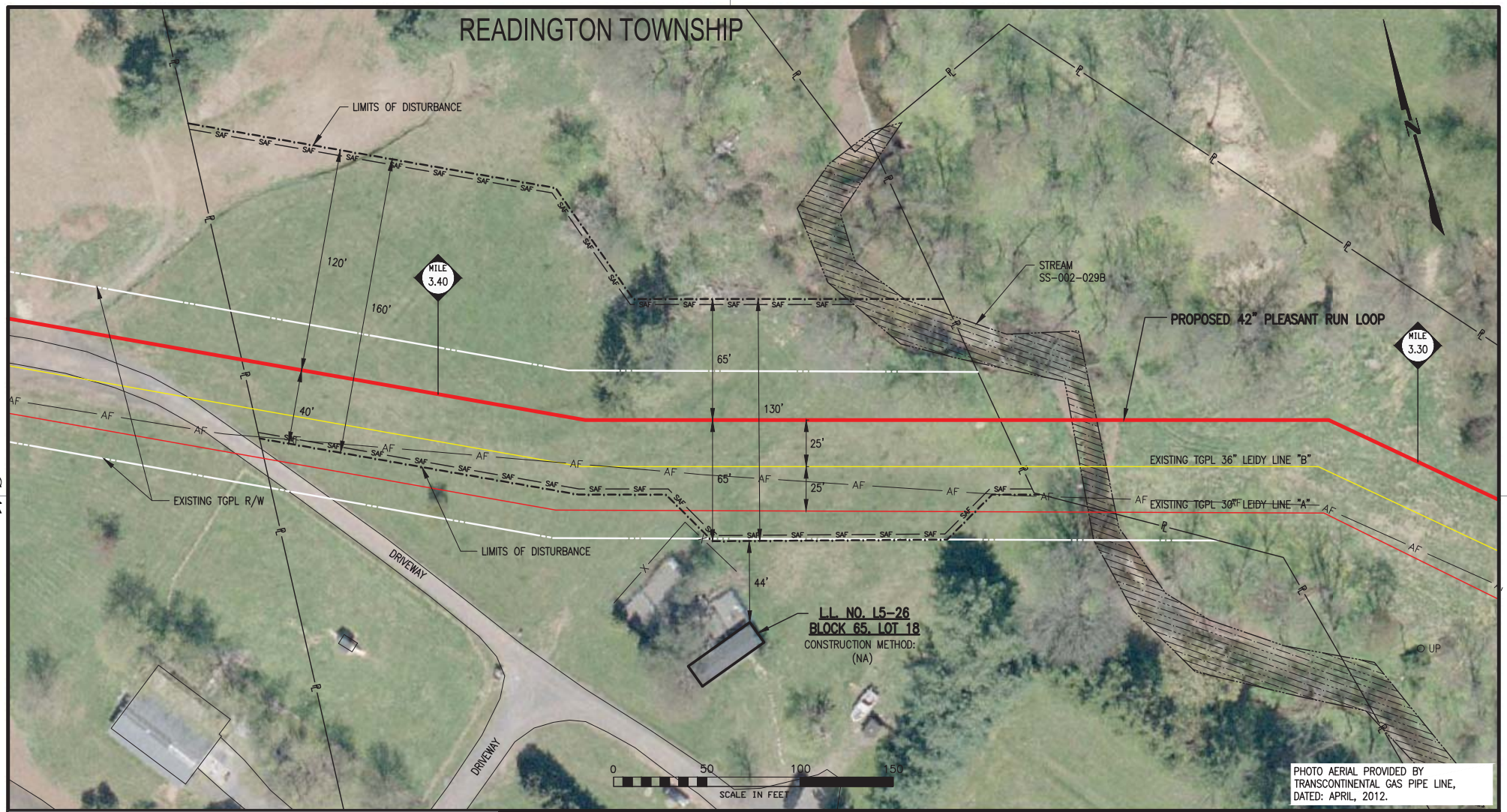
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-22C
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/03.21-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 10:14am wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_03.21-C.dwg	

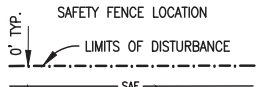


C-41

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
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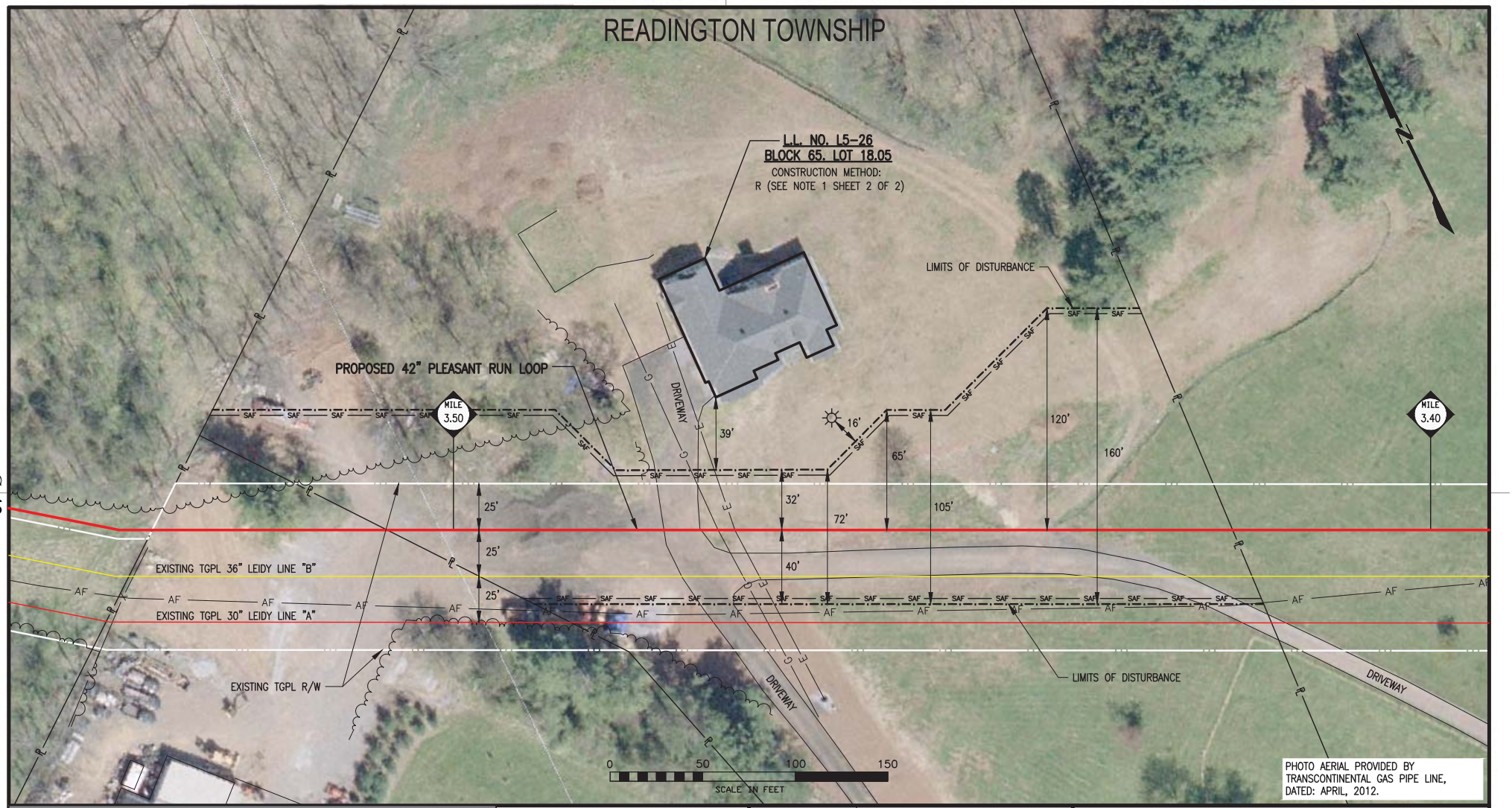
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-226
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/03.37-C	SHEET 1 OF 2
W.O. 1129993		1/15/2014 10:16am wtland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_03.37-C.dwg	

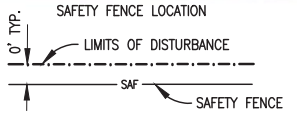


C-42

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

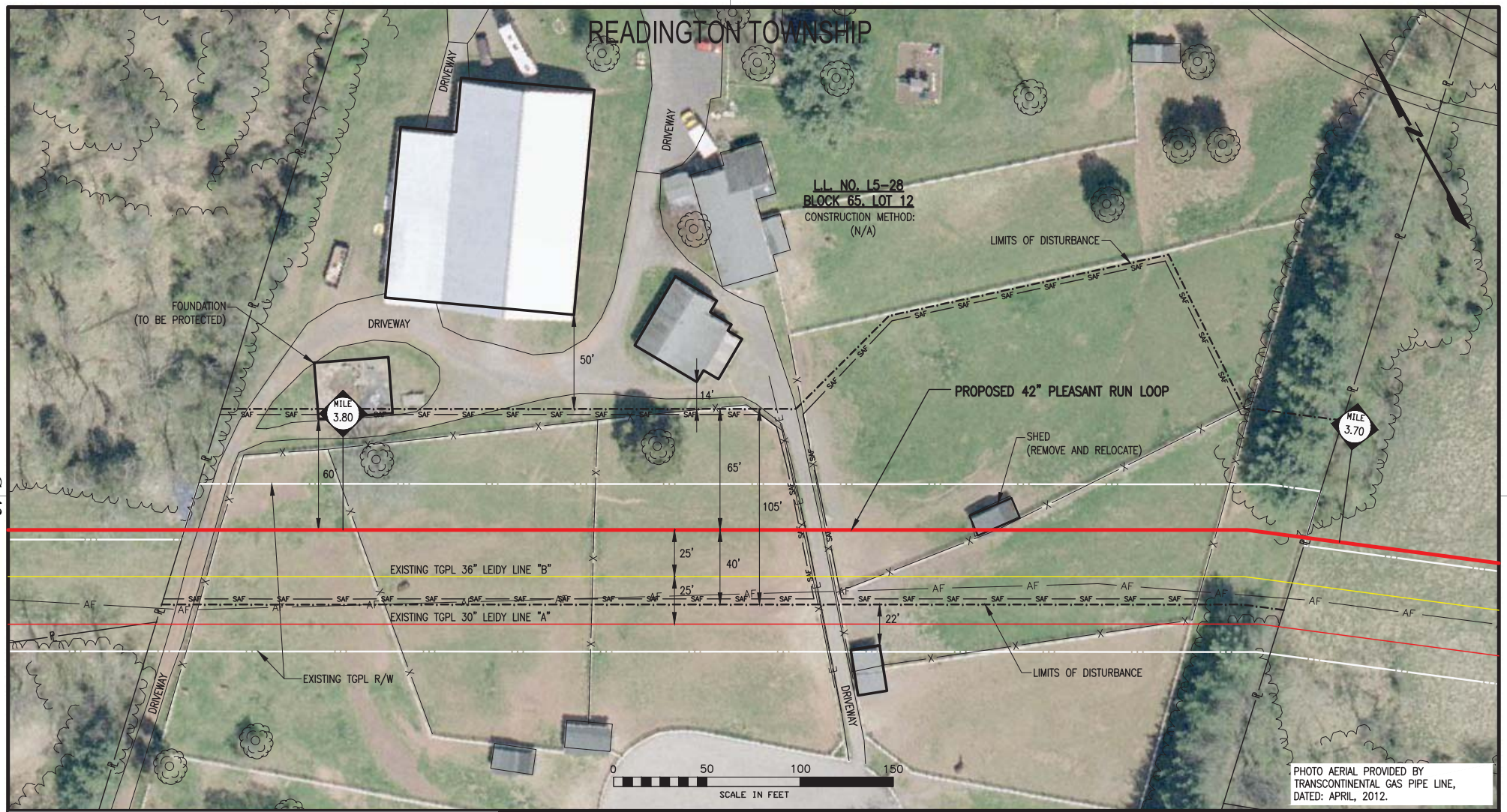
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-26
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14		
WO: 1129993		DRAWING NUMBER: 25-06-80/03.47-C	SHEET 1 OF 2

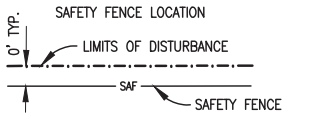
1/15/2014 10:20am wtland
K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_03.47-C.dwg



C-43

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

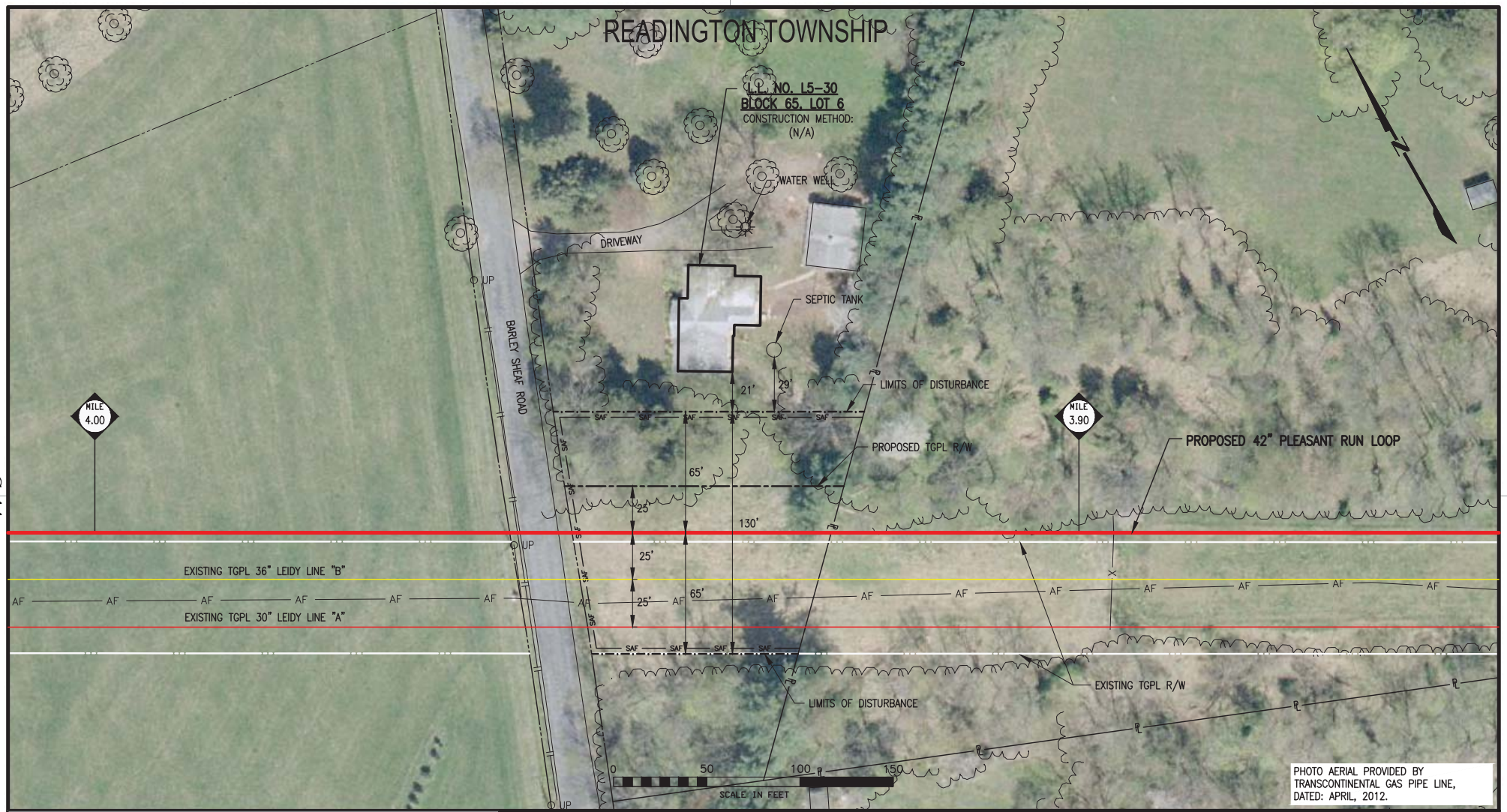
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-28
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

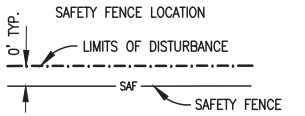
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/03.78-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 10:24am wtland K:\20346 – Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_03.78-C.dwg	



C-44

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

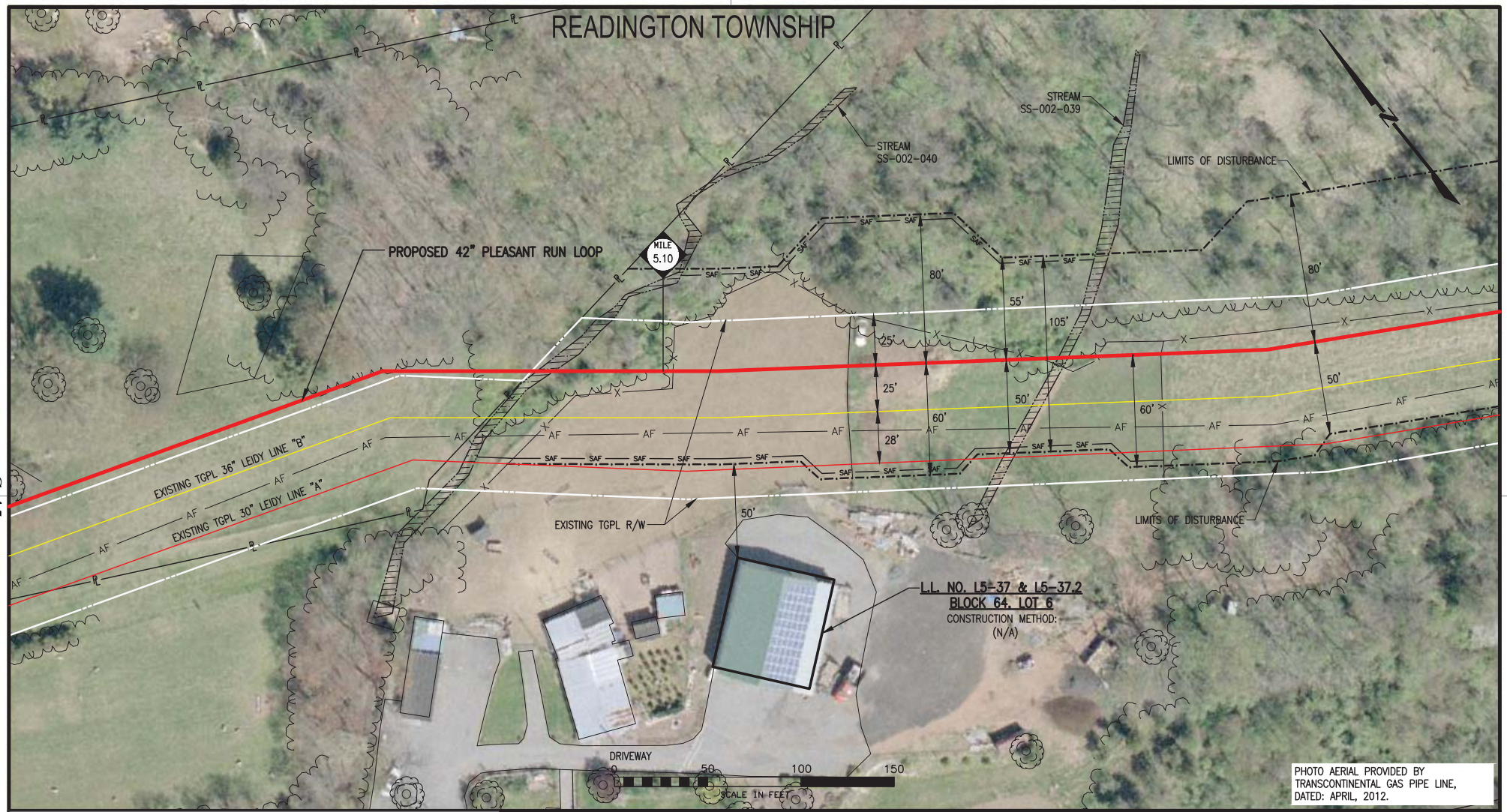
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-30
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/03.93-C	SHEET 1 OF 2
W.O.: 1129993		1/16/2014 10:23am mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_03.93-C.dwg	

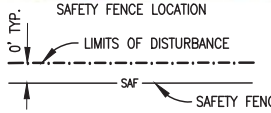


C-45

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

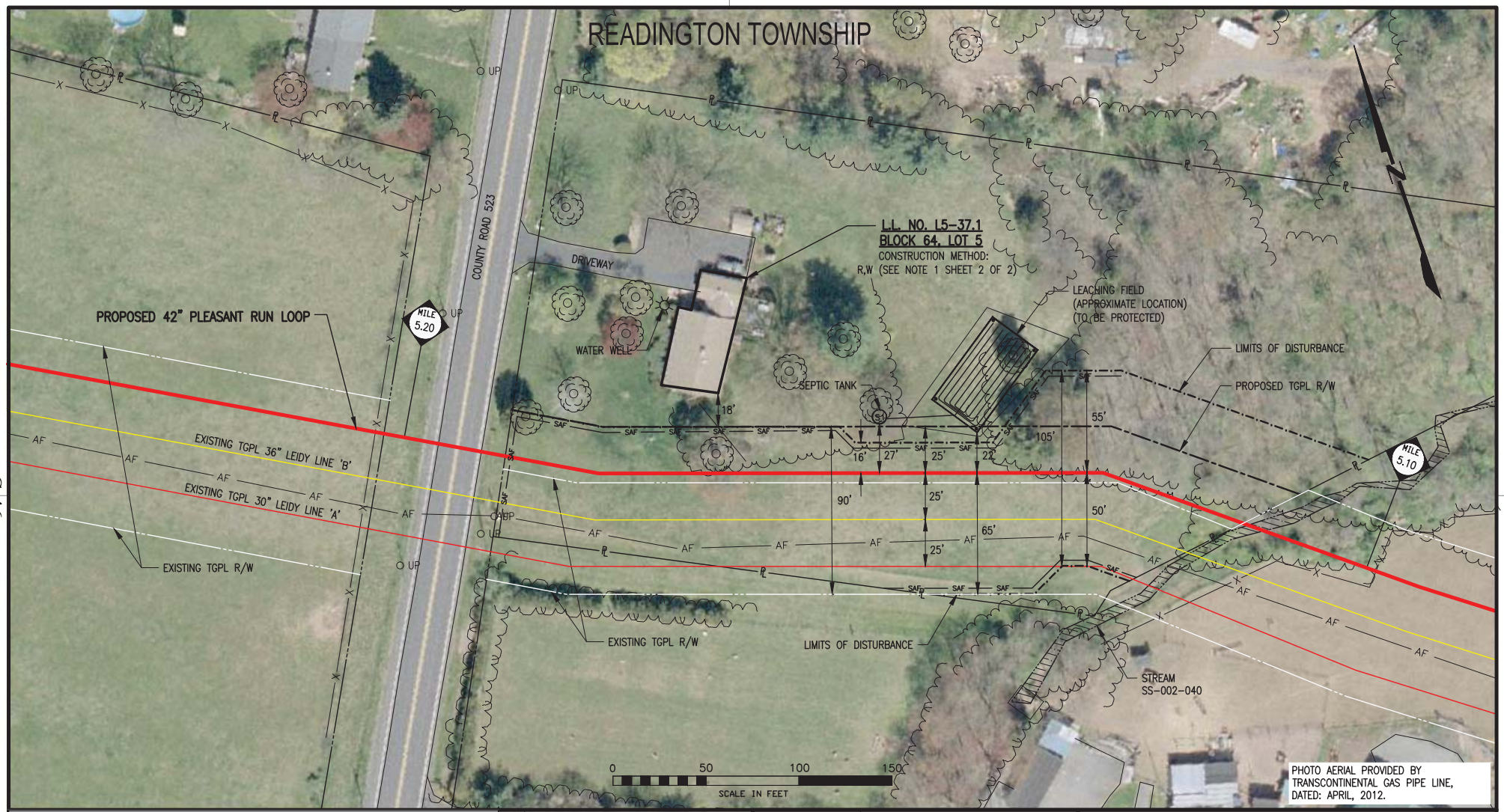
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-37 & L5-37.2
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/05.09-C	SHEET 1 OF 2
WO: 1129993		1/15/2014 10:47am ctland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_05.09-C.dwg	

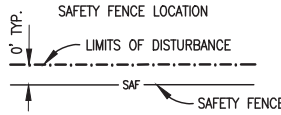


C-46

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	11/01/13	WGM	REVISED WORKSPACE TO AVOID SEPTIC SYSTEM	1129993	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-37.1
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14		
W.O: 1129993			

DRAWING NUMBER: 25-06-80/05.18-C — SHEET 1 OF 2

10:42am 1/15/2014 ctland
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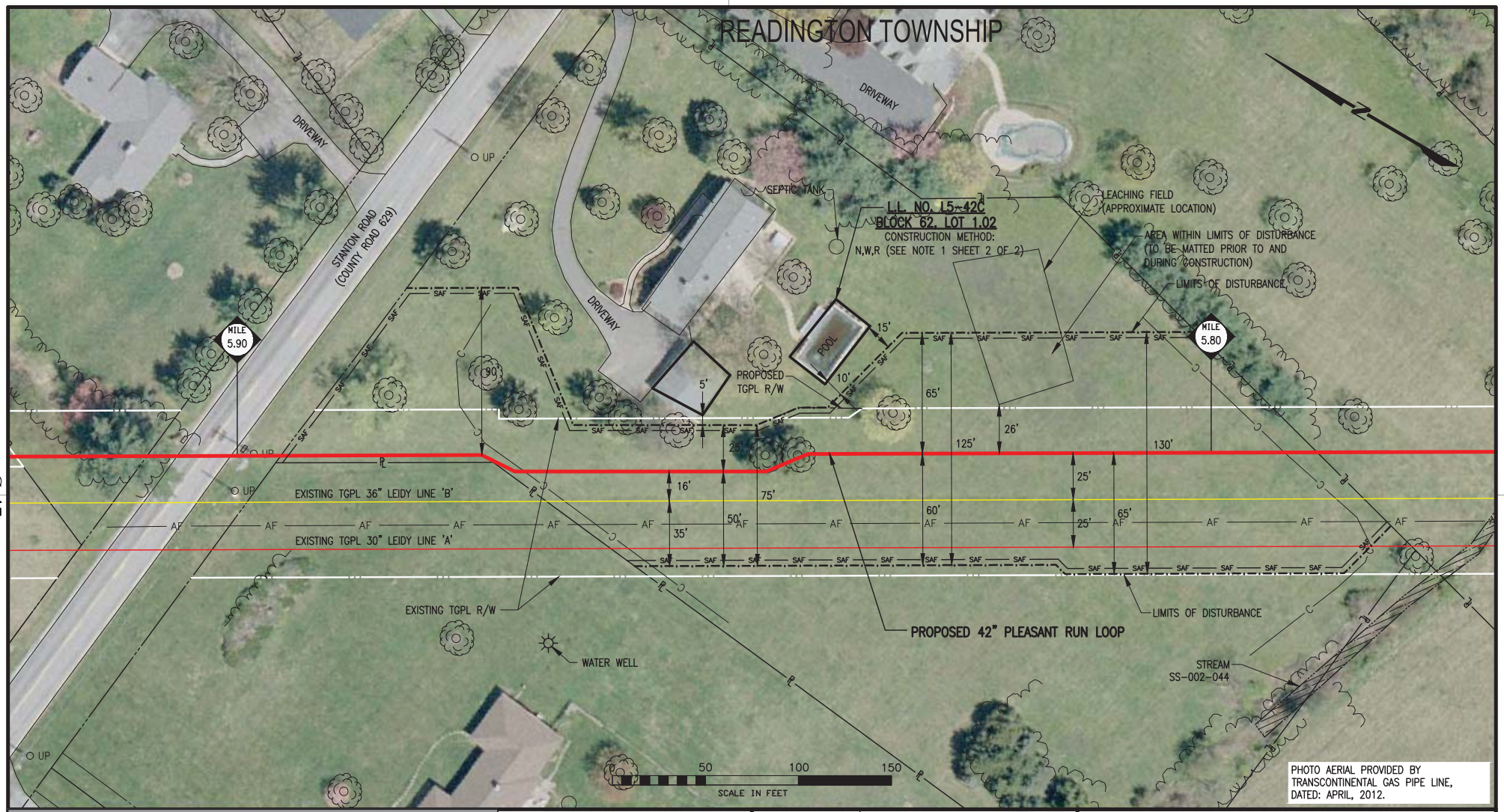
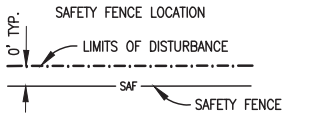


C-47

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

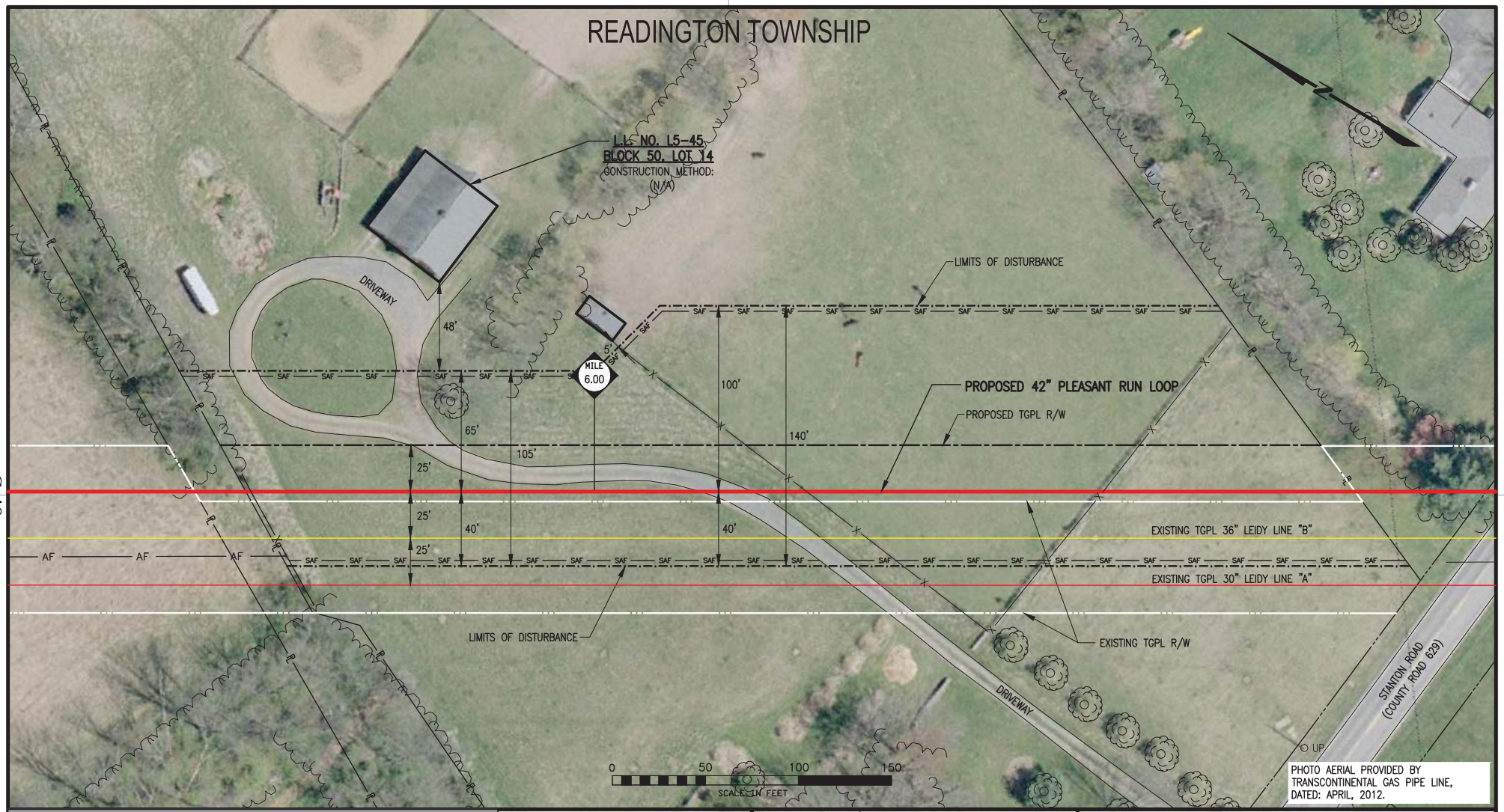
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	11/01/13	WGM	ADDED SEPTIC SYSTEM SURVEY	1129993	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-42C
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

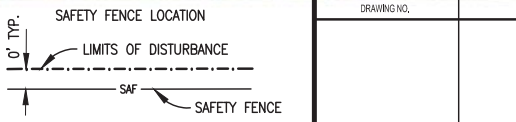
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/05.87-C	SHEET 1 OF 2
W.O.: 1129993		1/16/2014 10:33am mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_05.87-C.dwg	



C-48

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

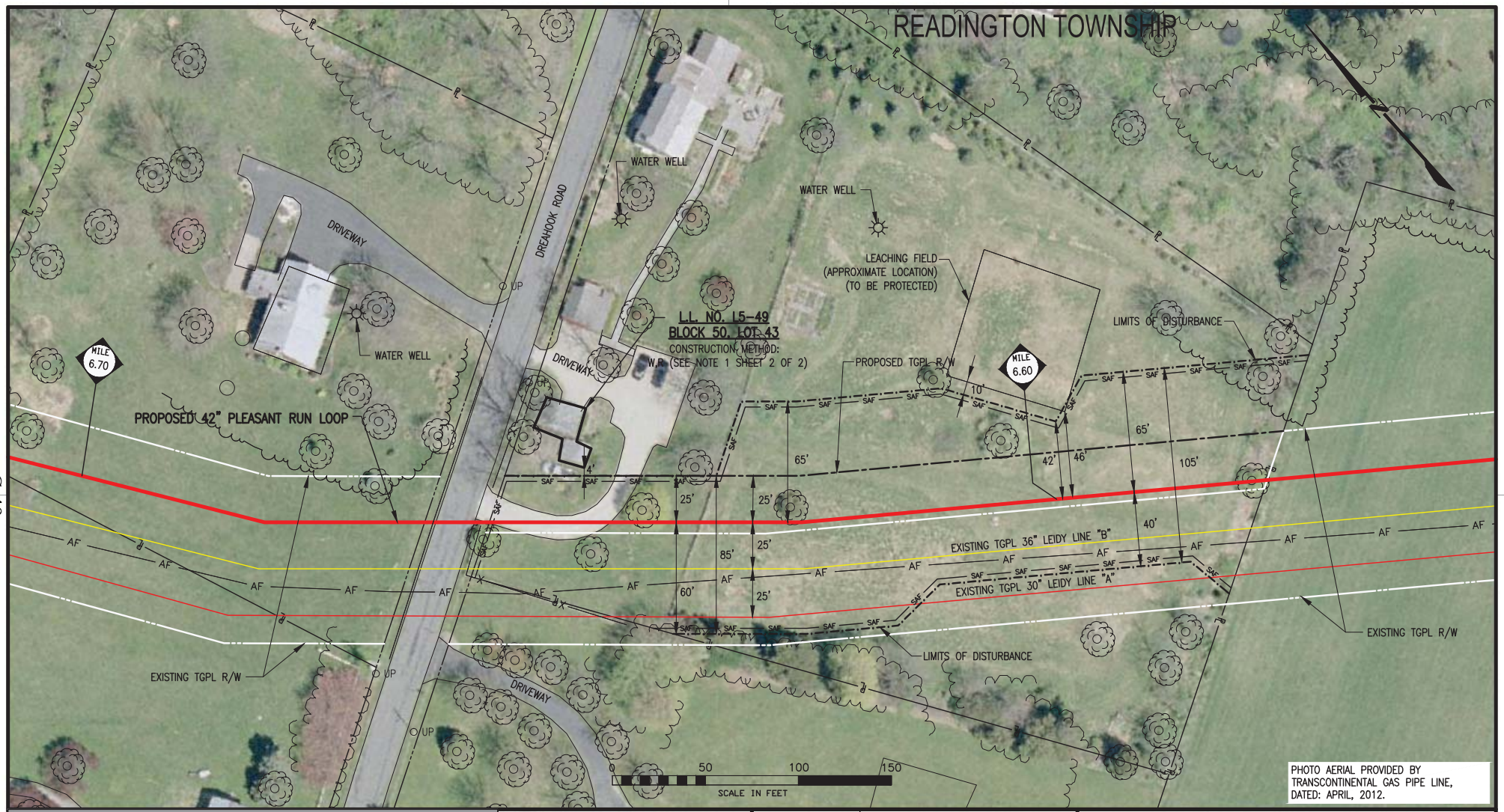
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-45
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/06.00-C	SHEET 1 OF 2
W.O: 1129993		1/16/2014 12:35pm mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_06.00-C.dwg	

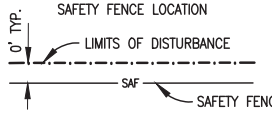


C-49

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

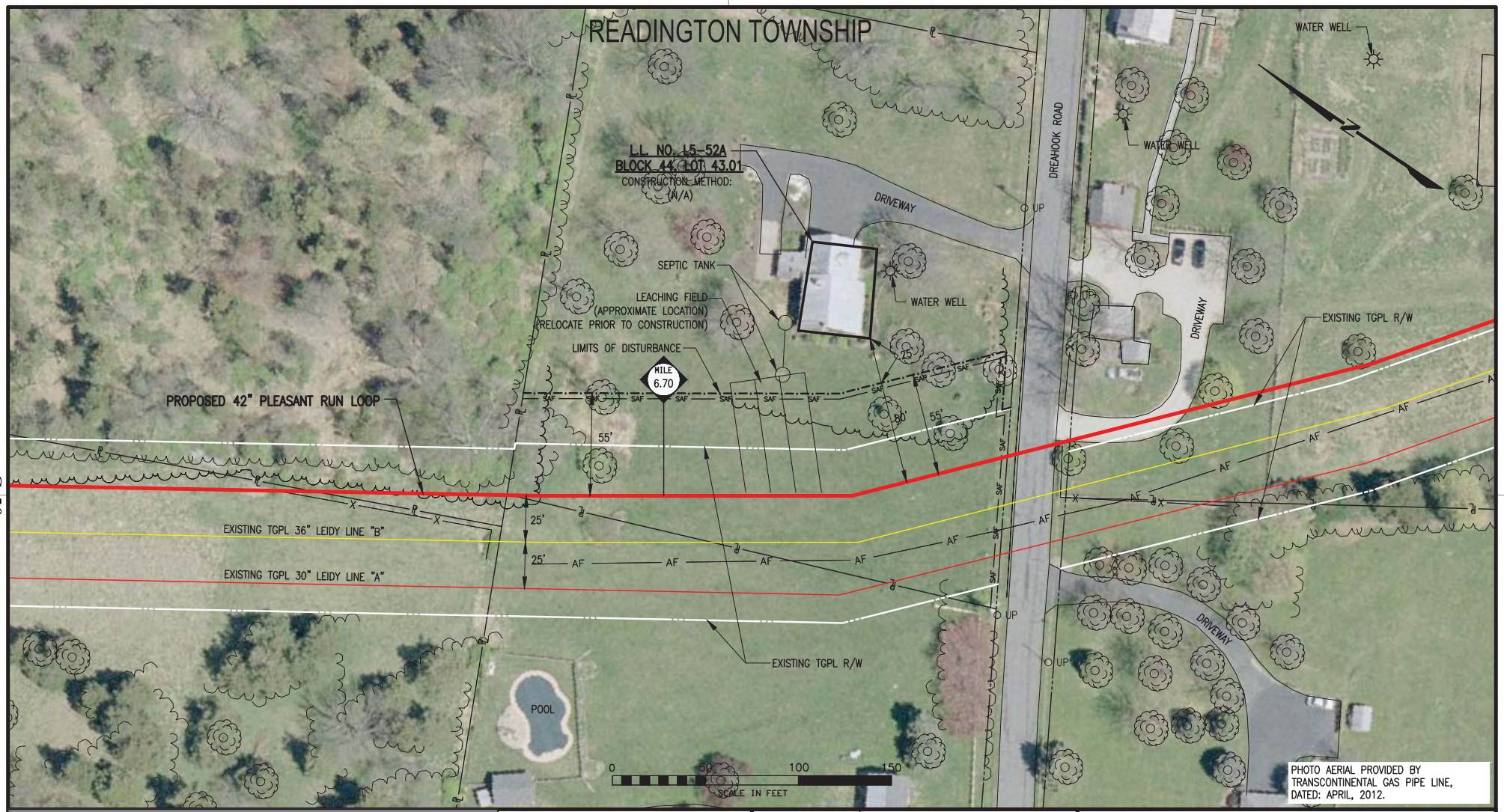
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	11/01/13	WGM	ADDED SEPTIC SYSTEM SURVEY	1129993	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-49
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/06.65-C	SHEET 1 OF 2
W.O.: 1129993		1/16/2014 10:41am mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_06.65-C.dwg	



C-50

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
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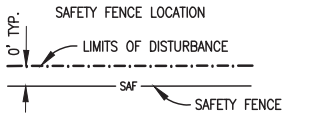
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

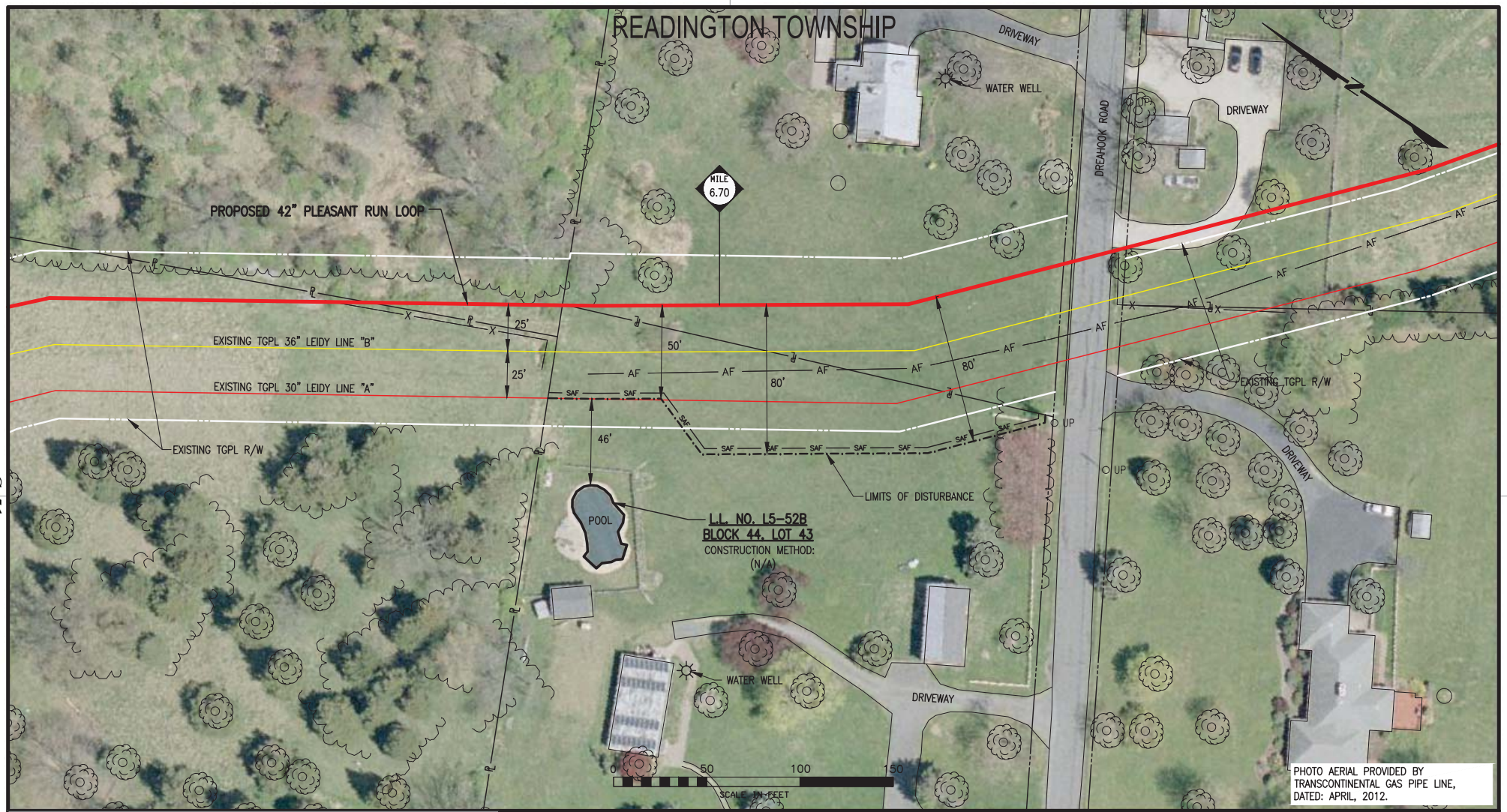
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	11/01/13	WGM	ADDED SEPTIC SYSTEM SURVEY	1129993	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-52A
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

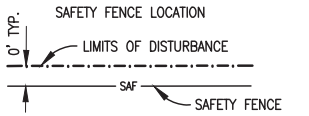
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/06.68-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 10:13am ctland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_06.68-C.dwg	



C-51

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

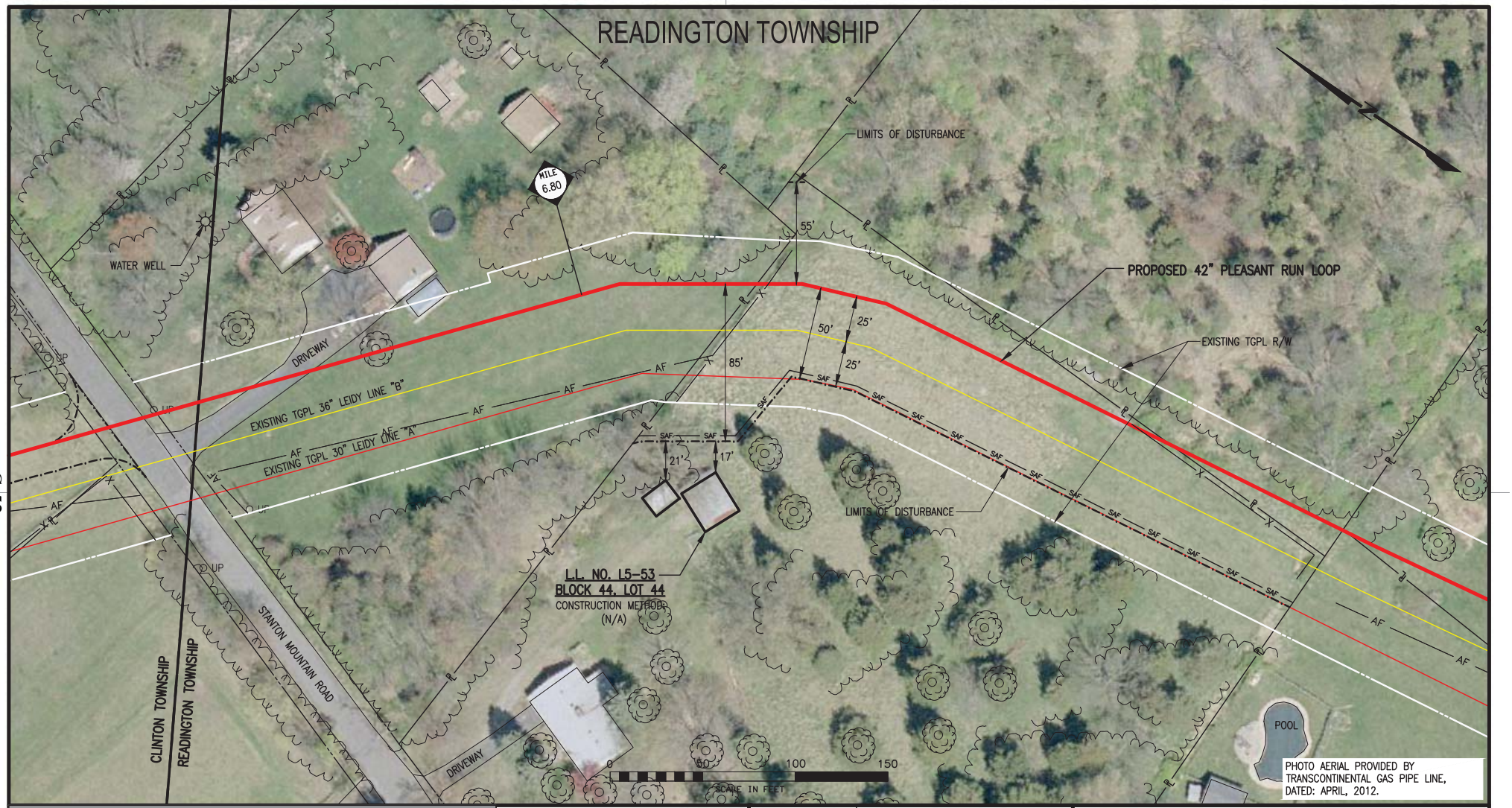
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-52B
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

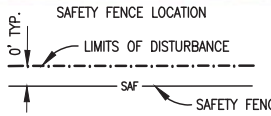
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/06.71-C	SHEET 1 OF 2
W.O.: 1129993		1/16/2014 11:04am mtho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_06.71-C.dwg	



C-52

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

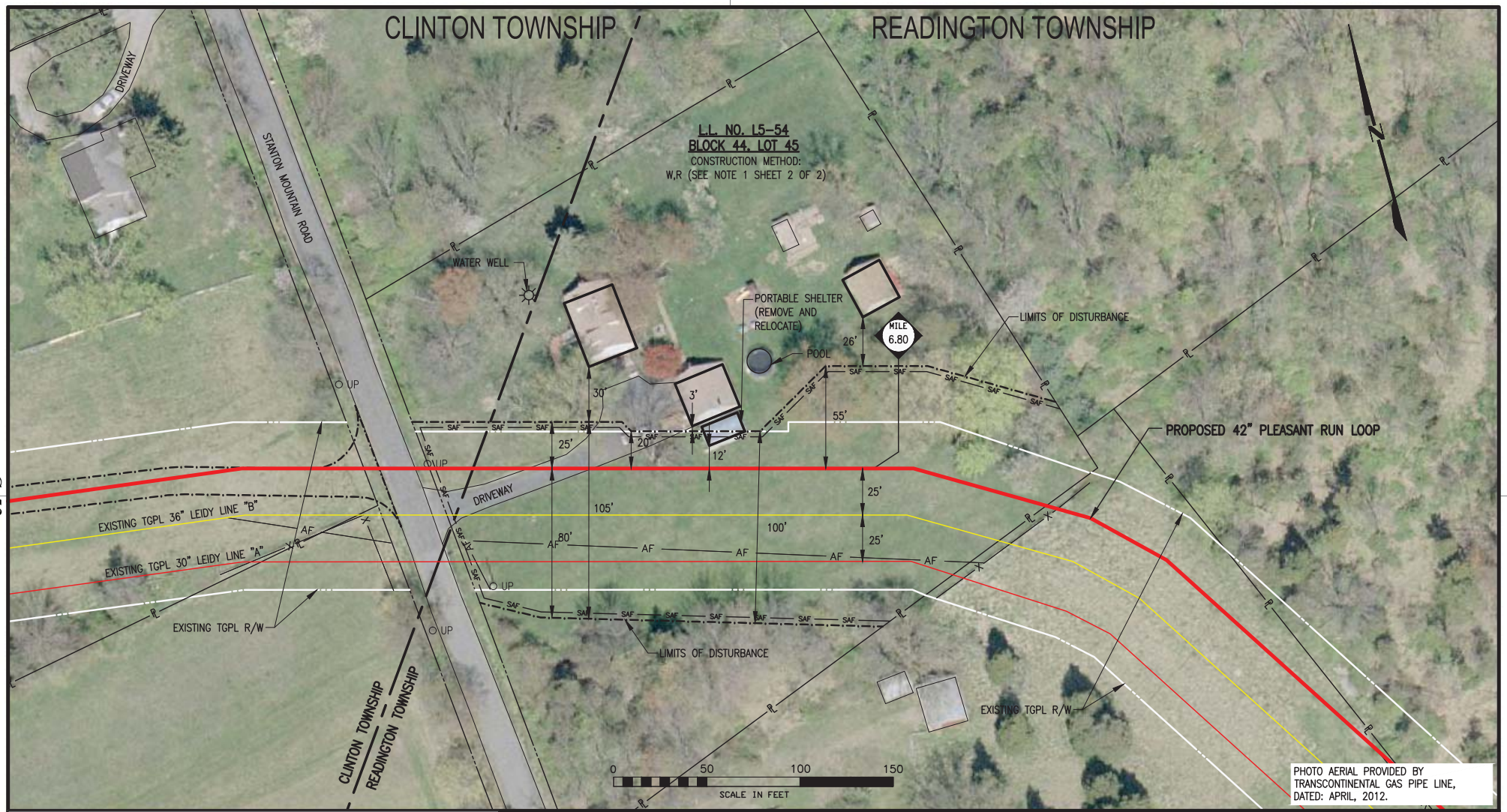
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-53
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

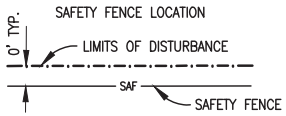
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/06.78-C	SHEET 1 OF 2
WO: 1129993		1/16/2014 11:08am mlho K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_06.78-C.dwg	



C-53

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

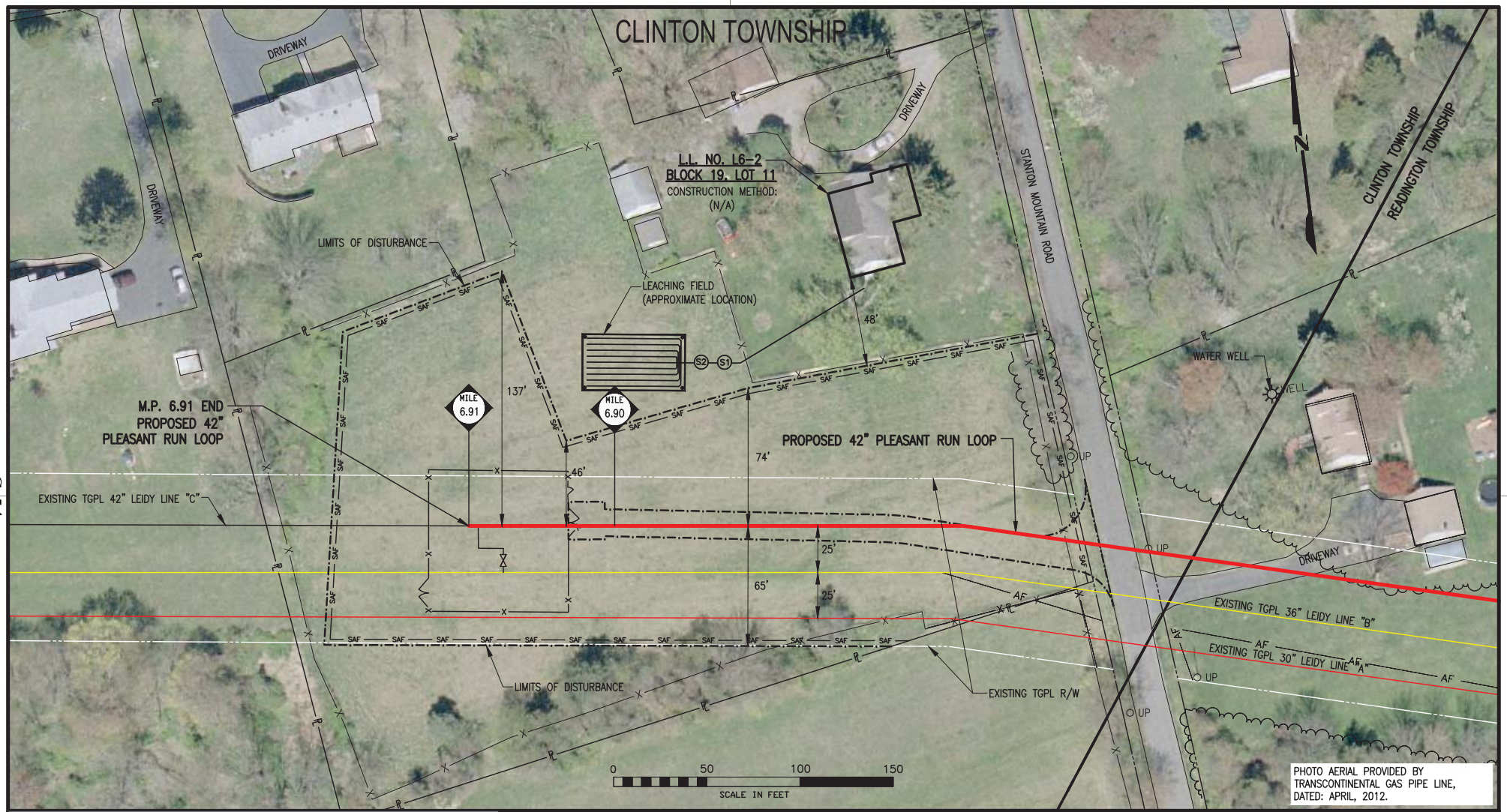
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L5-54
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

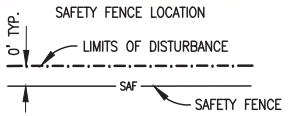
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/06.82-C	SHEET 1 OF 2
W.O.: 1129993		1/15/2014 9:53:3pm ctland K:\20346 – Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_06.82-C.dwg	



C-54

LEGEND

- PROPOSED 42" PLEASANT RUN LOOP
- EXISTING TGPL 30" LEIDY LINE "A"
- EXISTING TGPL 36" LEIDY LINE "B"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129993	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129993	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129993	BB	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129993	BB	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" PLEASANT RUN LOOP
FOR PROPERTY OF L.L. NO. L6-2
HUNTERDON COUNTY, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: BB	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-80/06.88-C	SHEET 1 OF 2
W.O: 1129993		1/15/2014 9:50am clland K:\20346 - Pleasant Run Loop\Mapping\Property Plats\RCP\25-06-80_06.88-C.dwg	

Transcontinental Gas Pipe Line Company, LLC.

LEIDY SOUTHEAST PROJECT

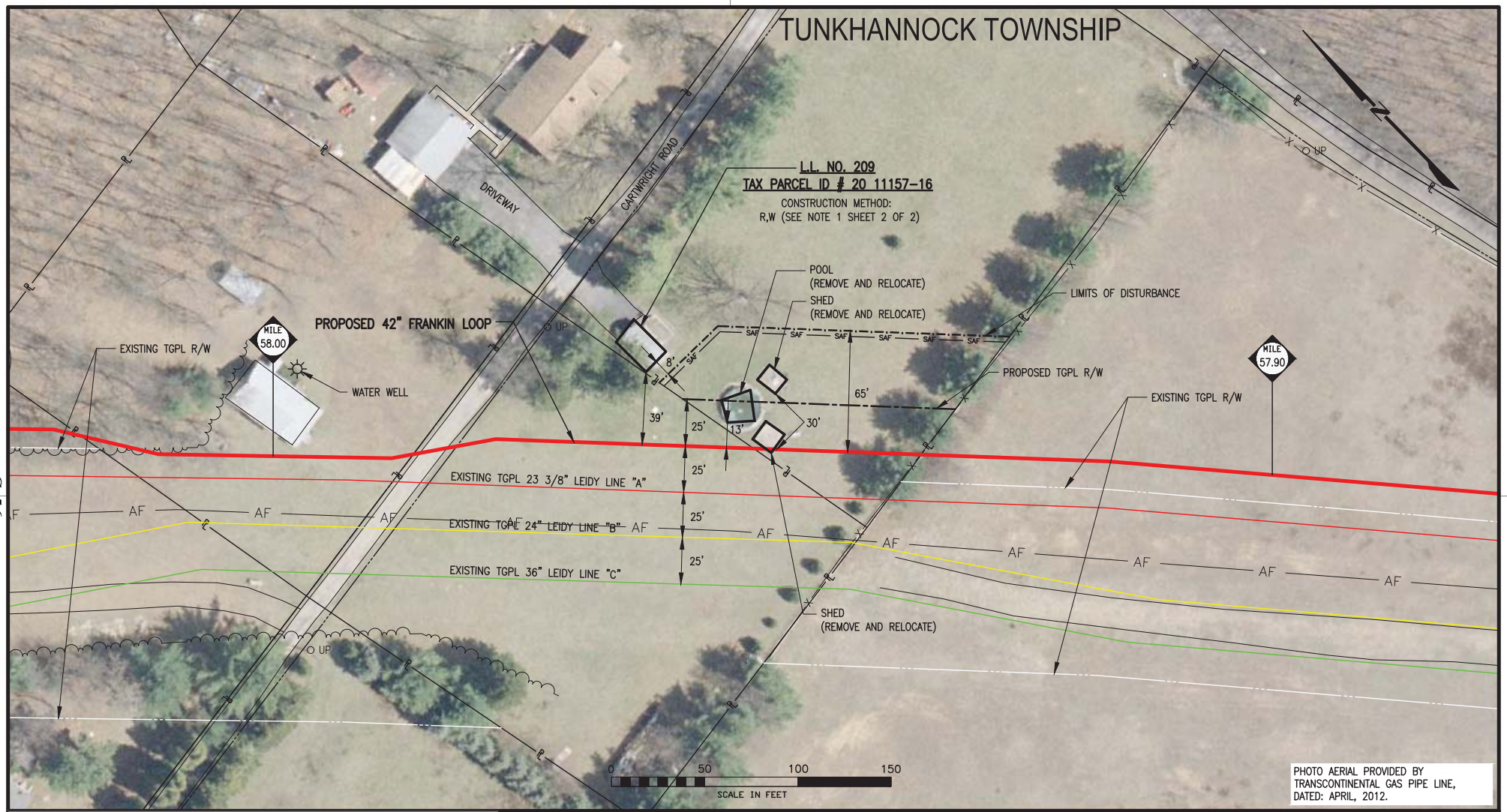
PROPOSED 42" FRANKLIN LOOP

LUZERNE & MONROE COUNTIES, PENNSYLVANIA

RESIDENTIAL CONSTRUCTION PLAN

11.47 MI. 42" PIPELINE – M.P. 57.51 TO M.P. 68.95

DATE: 1-17-2014

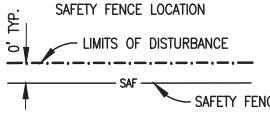


C-56

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

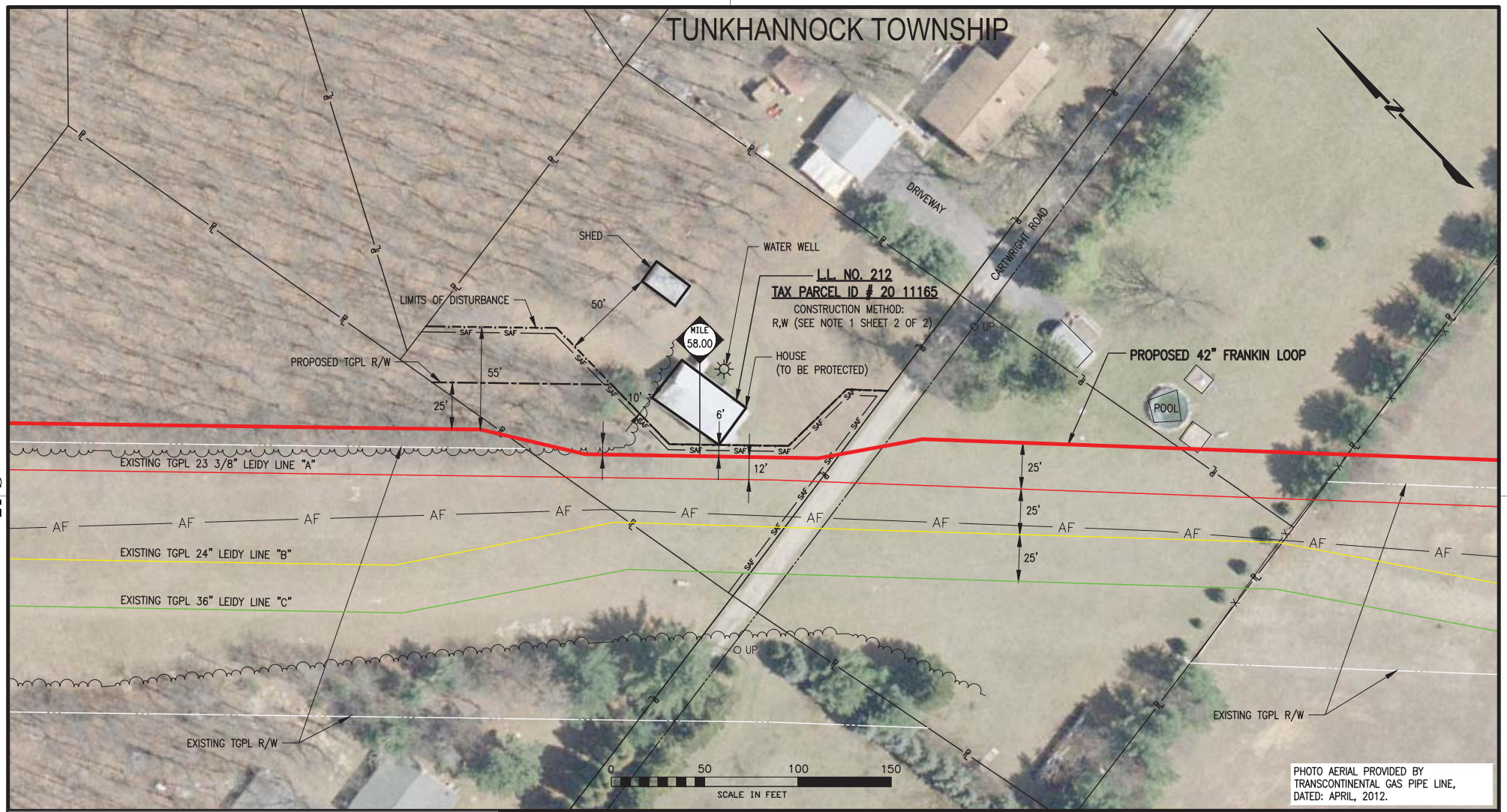
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 209
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

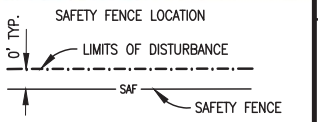
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/57.95-D	SHEET 1 OF 2
W.O: 1129991		1/14/2014 8:04am ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_57.95-D.DWG	



C-57

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 212
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

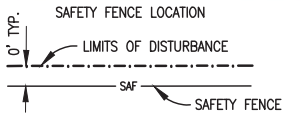
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/58.00-D	SHEET 1 OF 2
W.O: 1129991		1/14/2014 ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_58.00-D.DWG	

PHOTO AERIAL PROVIDED BY TRANSCONTINENTAL GAS PIPE LINE, DATED: APRIL, 2012.

C-58

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

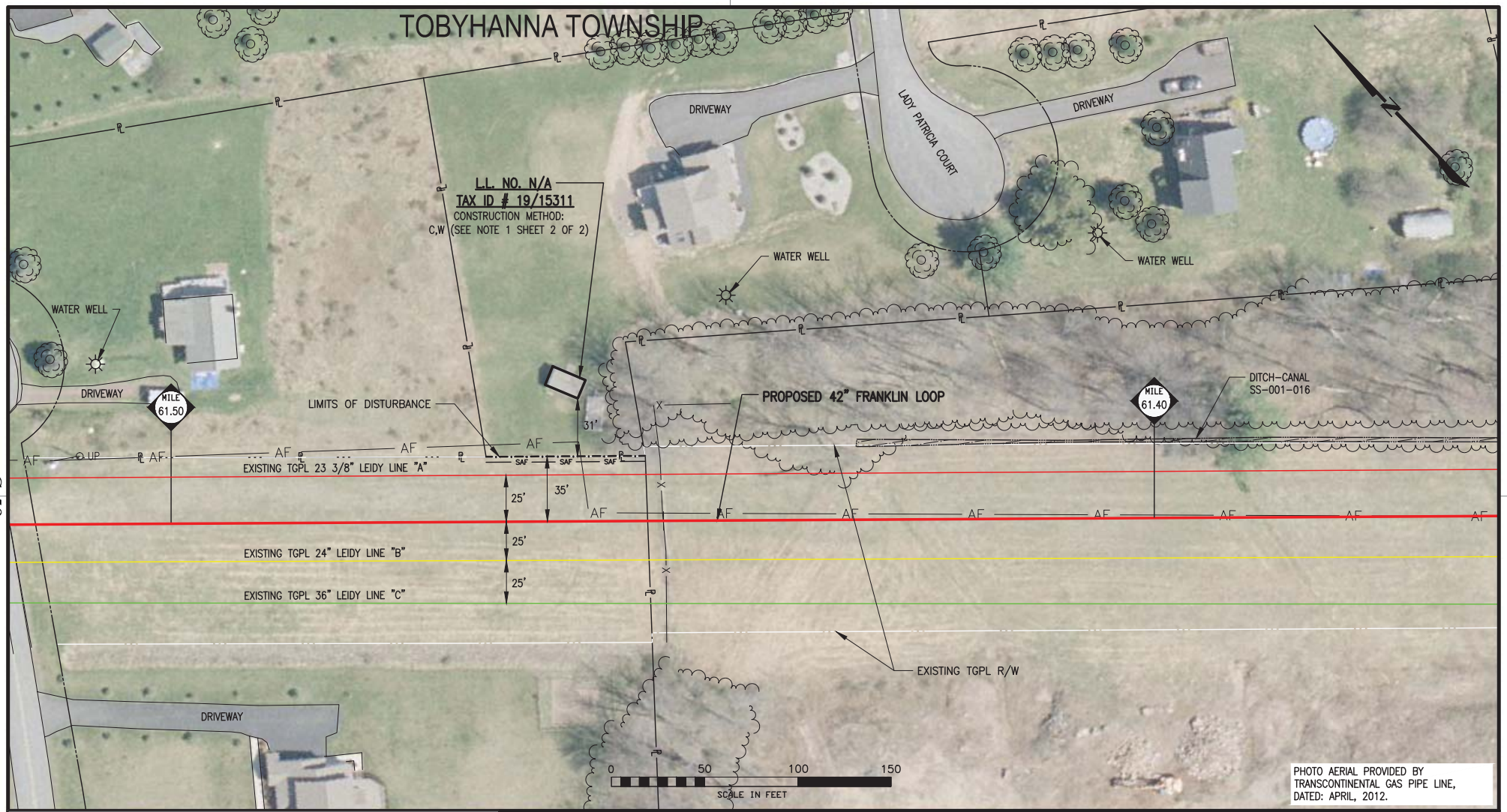
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH
1	9/16/13	WGM	ISSUED FOR FINAL REVIEW	1129991	JD	MJH
2	9/16/13	WGM	ISSUED FOR FERC FILING	1129991	JD	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	JD	MJH
4	1/17/14	WGM	ISSUED FOR SUPP EVENTS FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. N/A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/59.55-D	SHEET 1 OF 2
WO: 1129991		1/17/2014 4:10pm mlho K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_59.55-D(Road).DWG	

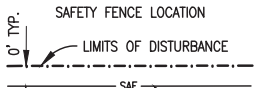


C-59

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

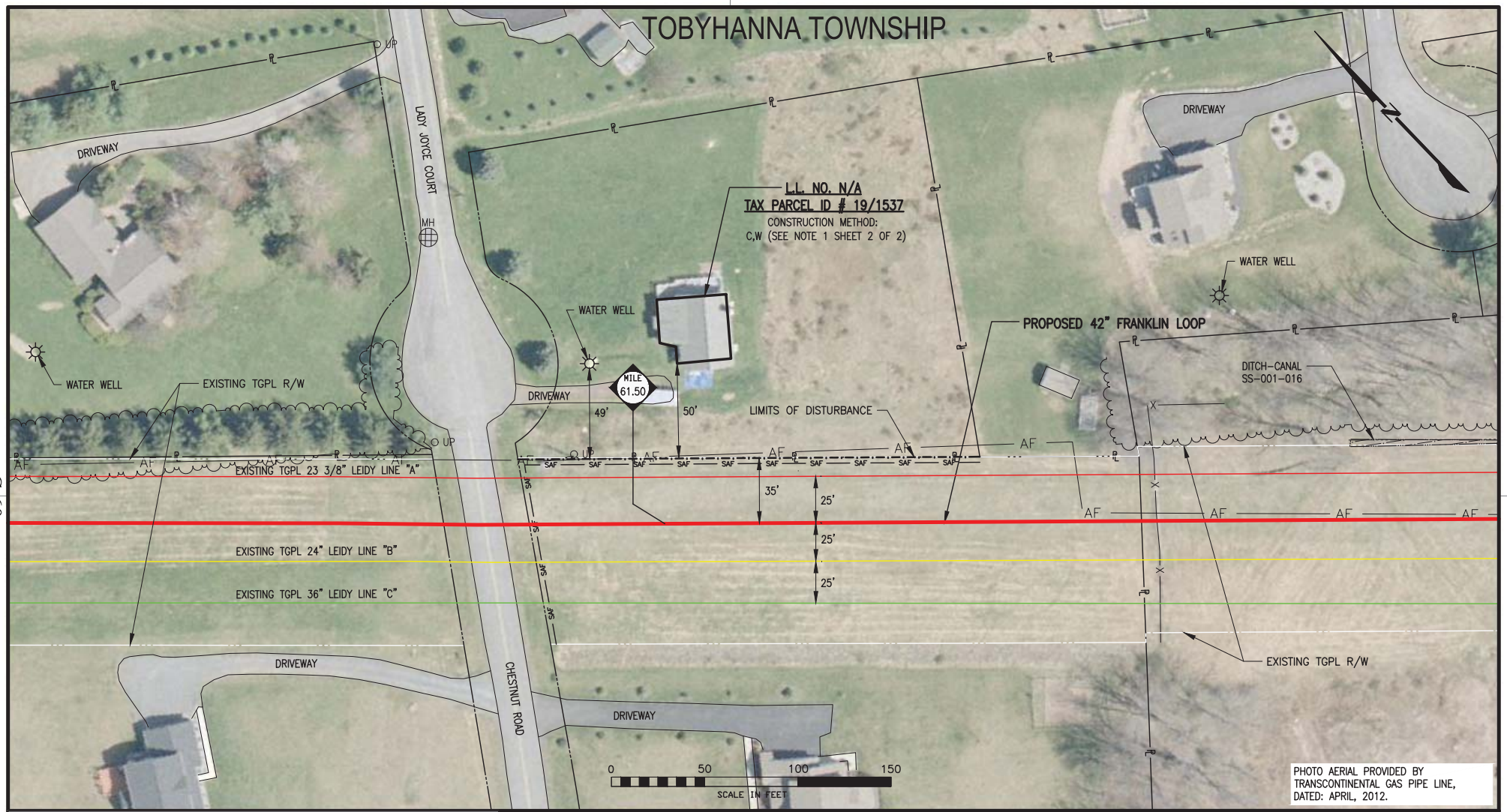
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. N/A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

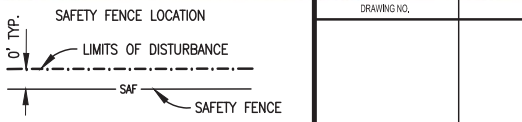
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.46-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 9:24am ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_61.46-D.DWG	



C-60

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

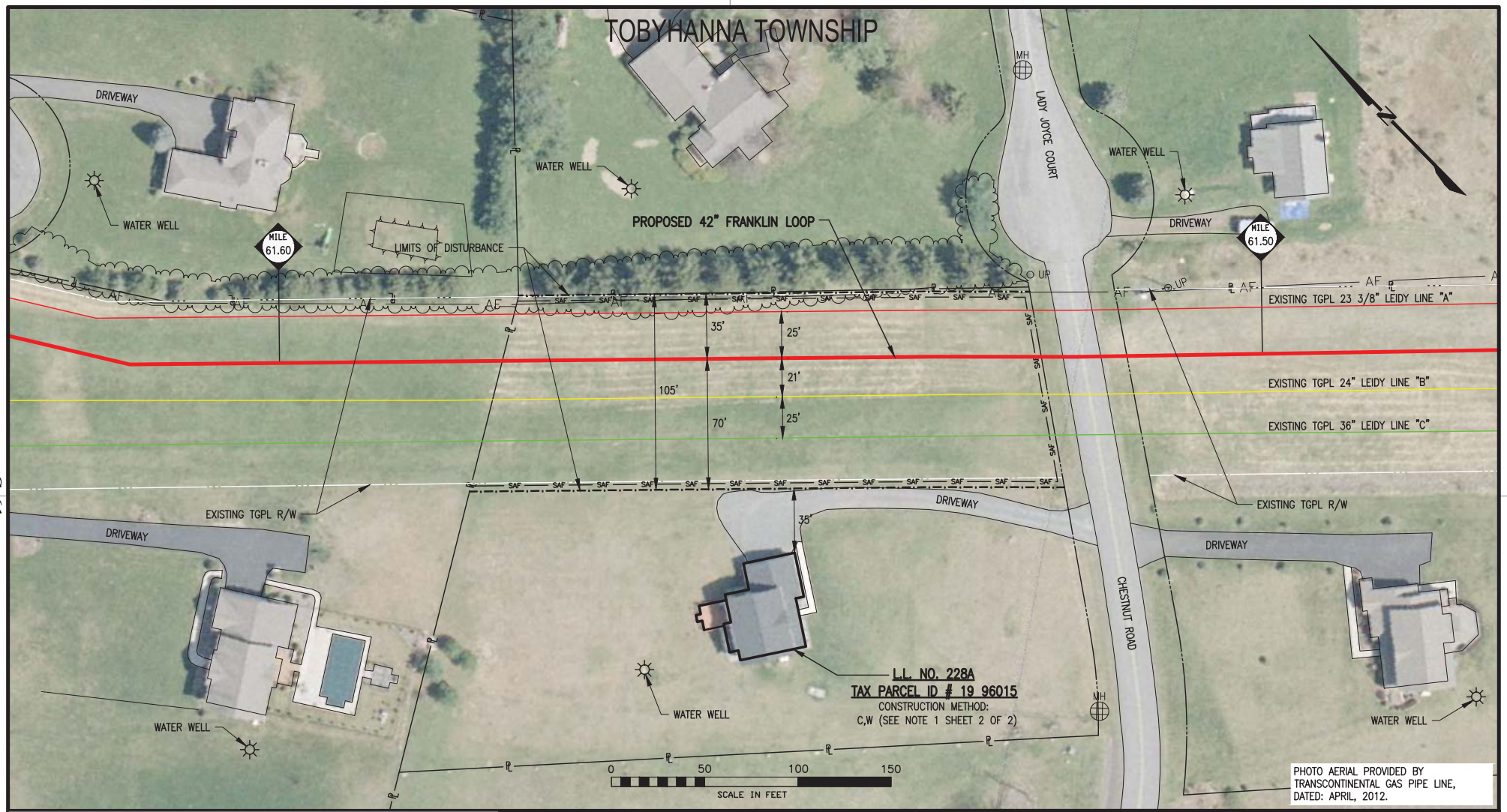
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. N/A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.49-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 9:28:0mm ctland K:\20345 --Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_61.49-D.DWG	

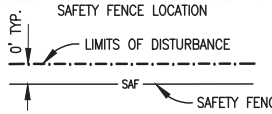


C-91

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

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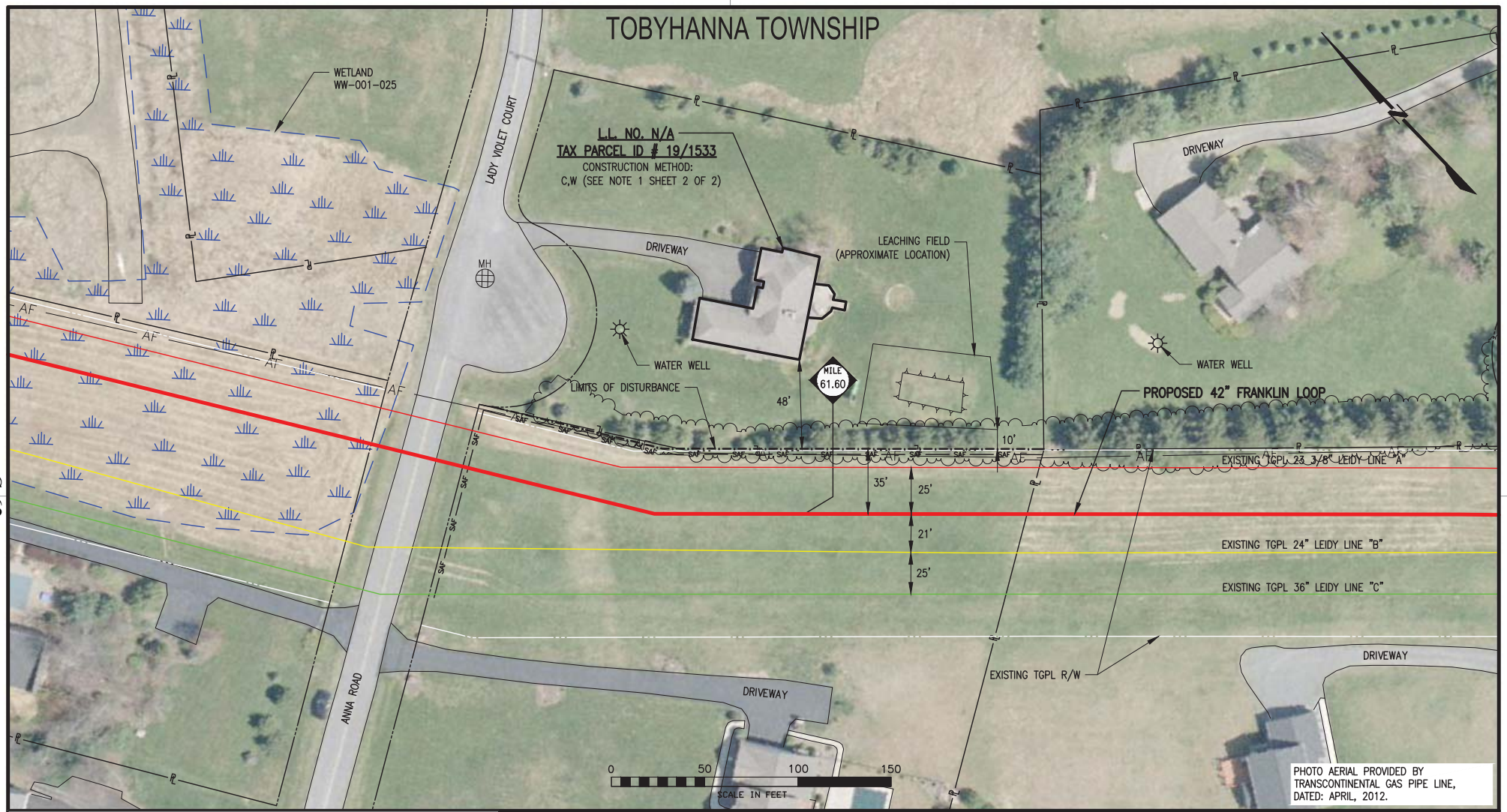
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 228A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.54-D	SHEET 1 OF 2
W.O.: 1129991		1/14/2014 9:35am ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP_25-06-1000_61.54-D.DWG	

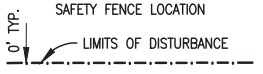


C-92

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



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NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
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3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. N/A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

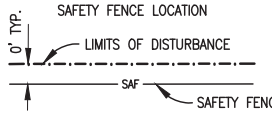
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.60-D	SHEET 1 OF 2
W.O: 1129991		1/16/2014 12:59pm mtho K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_61.60-D.DWG	

C-63

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



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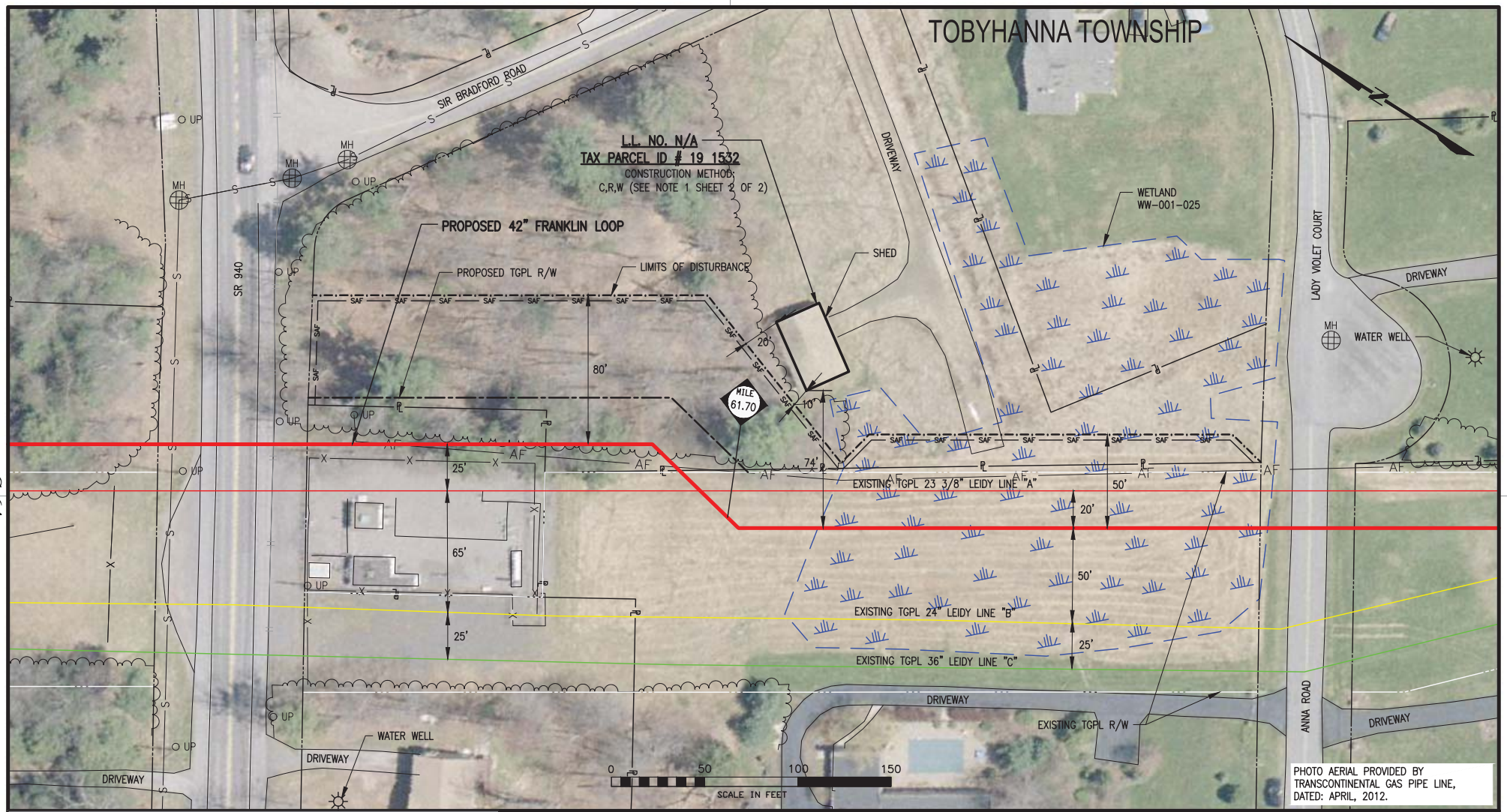
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 228A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.61-D	SHEET 1 OF 2
W.O.: 1129991		1/14/2014 11:01am ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_61.61-D.DWG	



C-64

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
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- WETLAND
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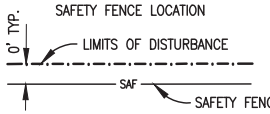
- UP — UTILITY POLE

SAFETY FENCE LOCATION



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TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. N/A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.69-D	SHEET 1 OF 2
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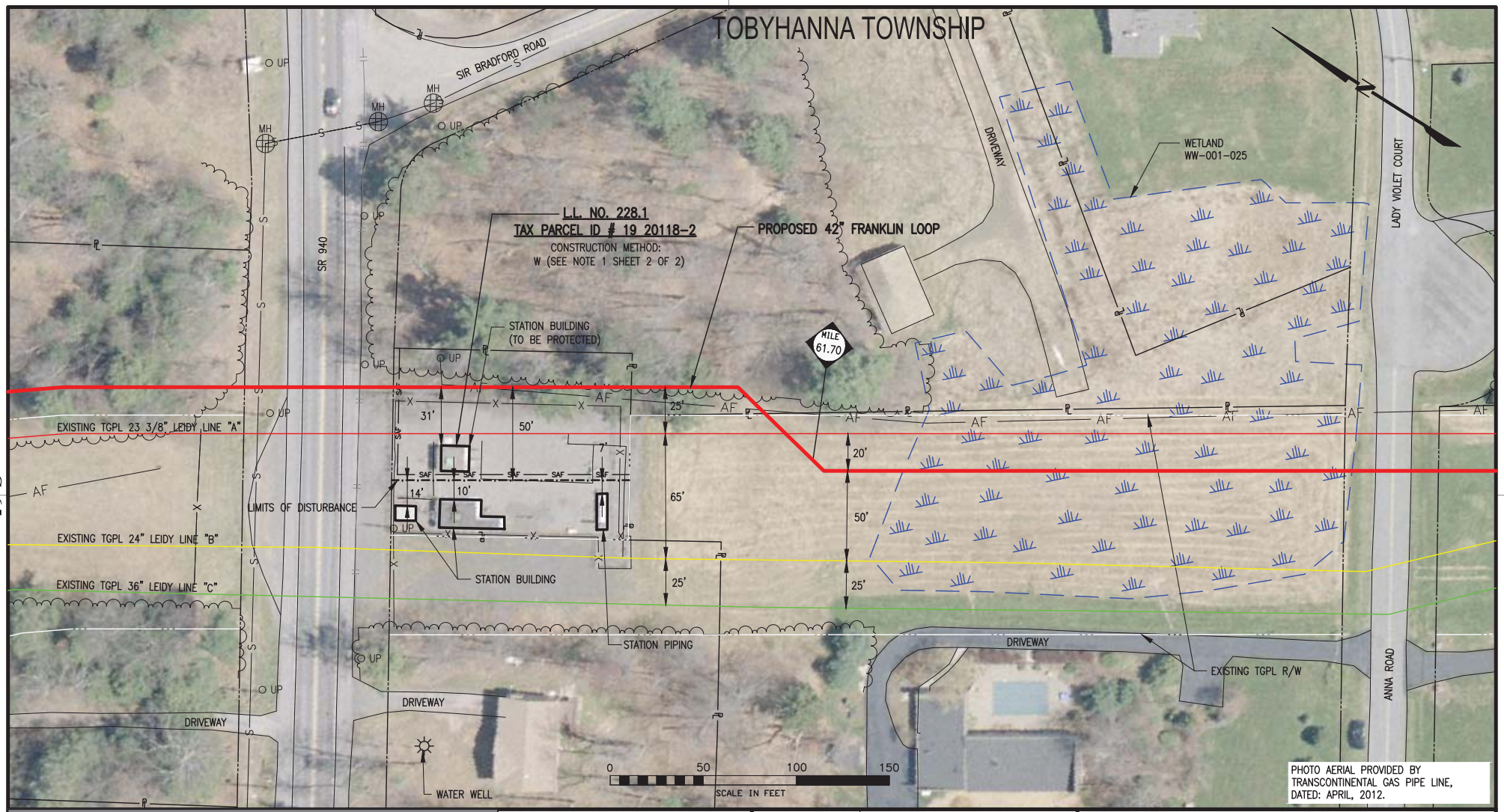

C-65

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
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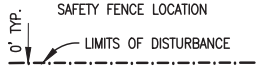
- UP — UTILITY POLE

SAFETY FENCE LOCATION



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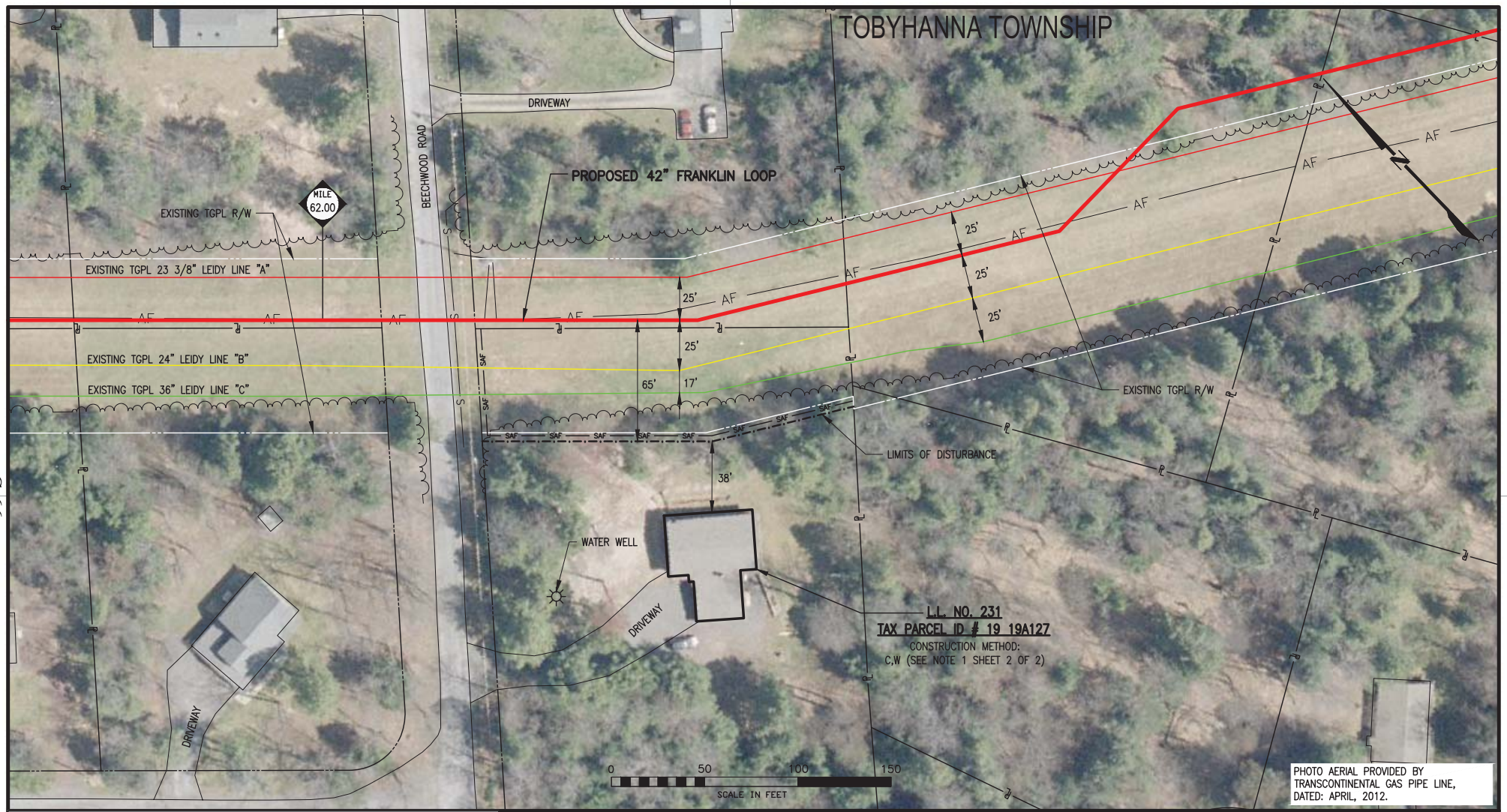
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. N/A
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.72-D	SHEET 1 OF 2
W.O.: 1129991		1/14/2014 11:10am ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_61.72-D.DWG	



C-66

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
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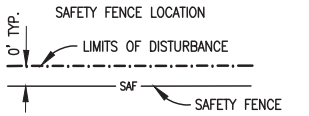

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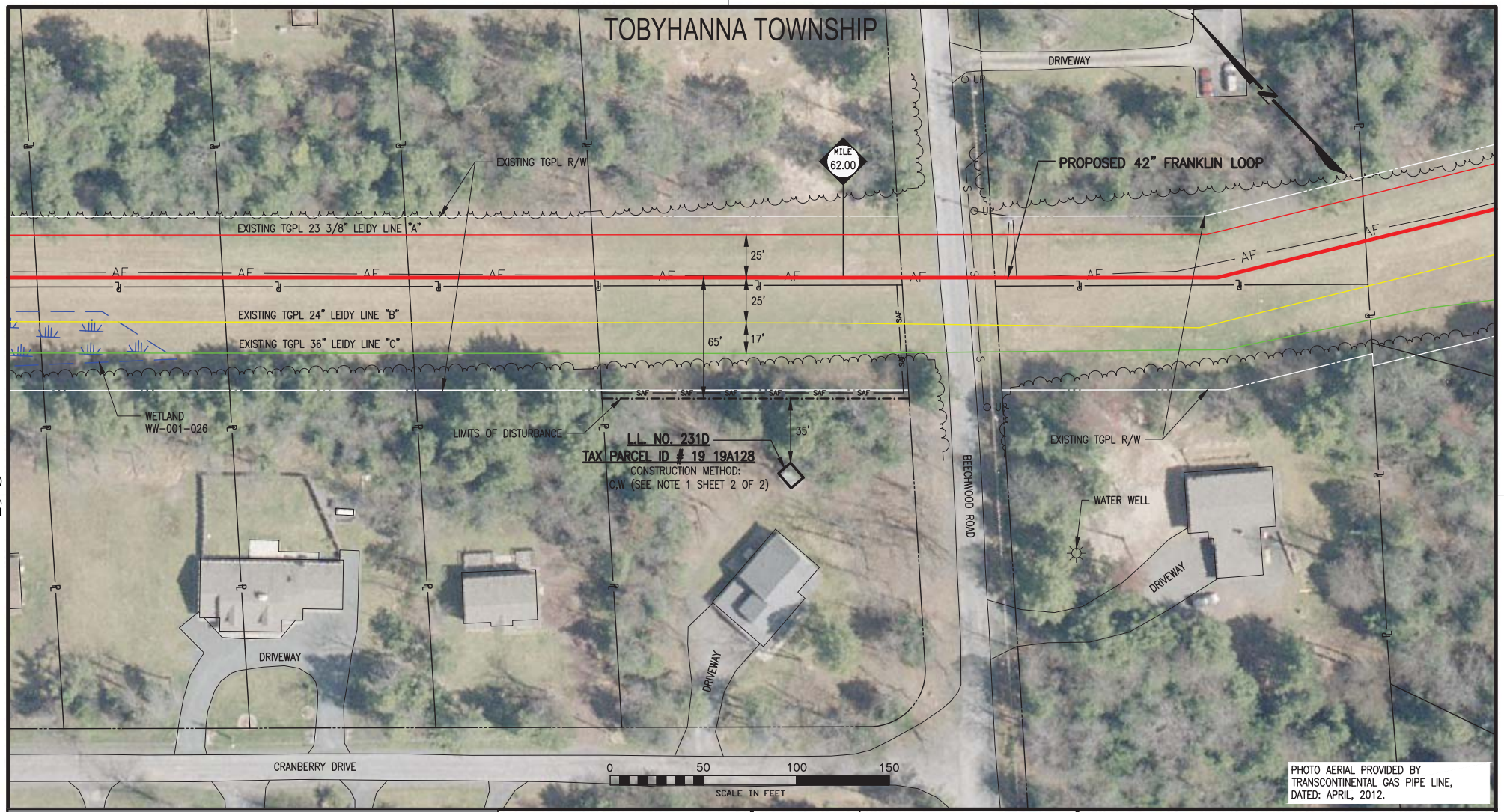
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/61.97-D	SHEET 1 OF 2
W.O: 1129991		1/16/2014 1:04pm mtho K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_61.97-D.DWG	



C-97

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
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- PROPOSED TGPL R/W
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- ROAD R/W
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- SAF — CONSTRUCTION SAFETY FENCE
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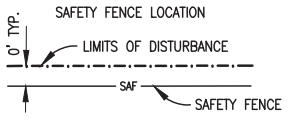

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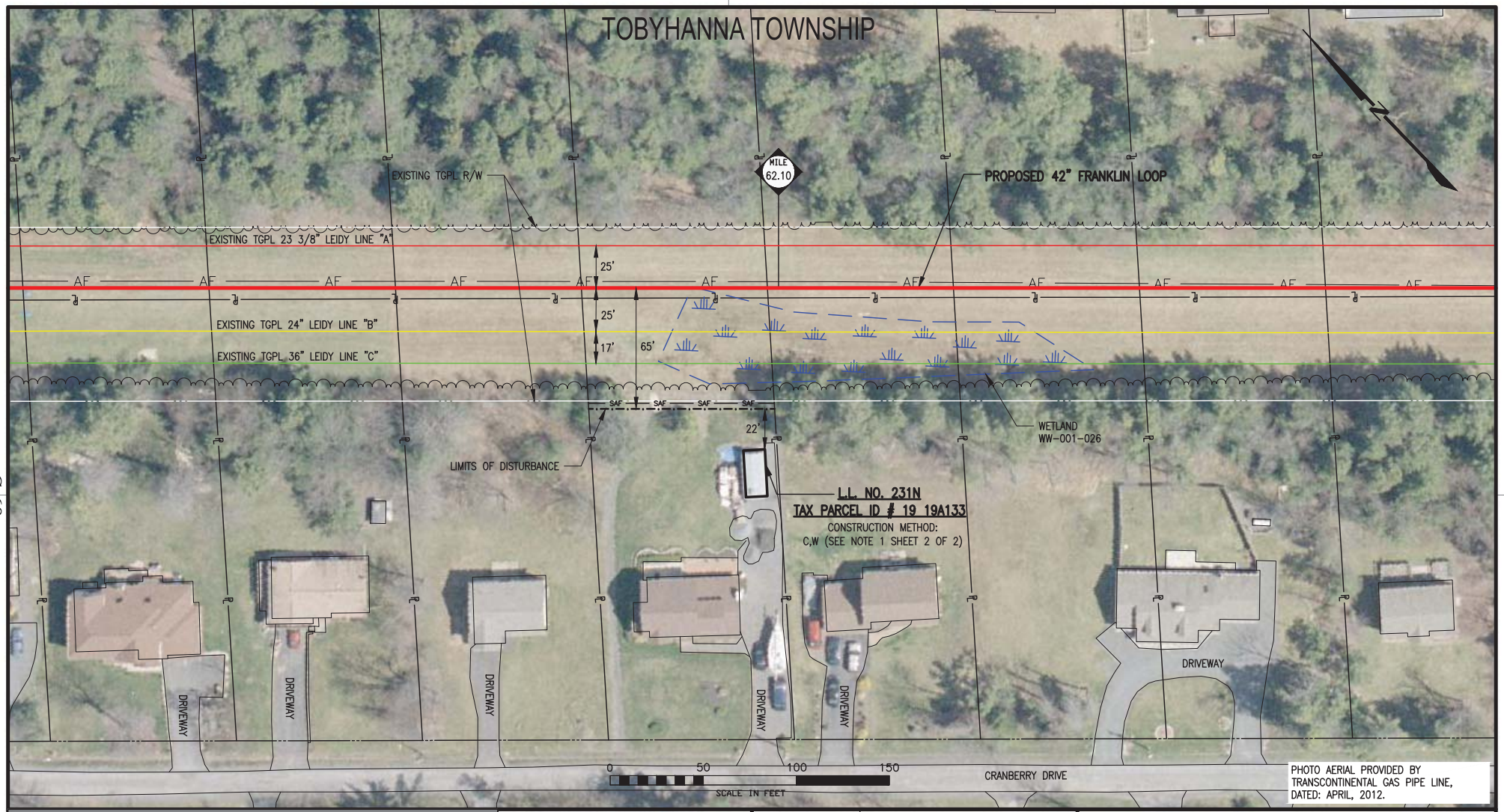
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231D
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

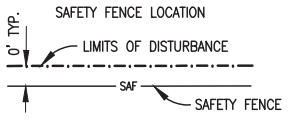
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.01-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 11:23am ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.01-D.DWG	



C-68

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231N
MONROE COUNTY, PENNSYLVANIA

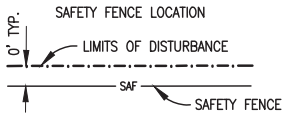
Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.11-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 12:53:3pm ctland K:\20345 --Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.11-D.DWG	

C-69

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

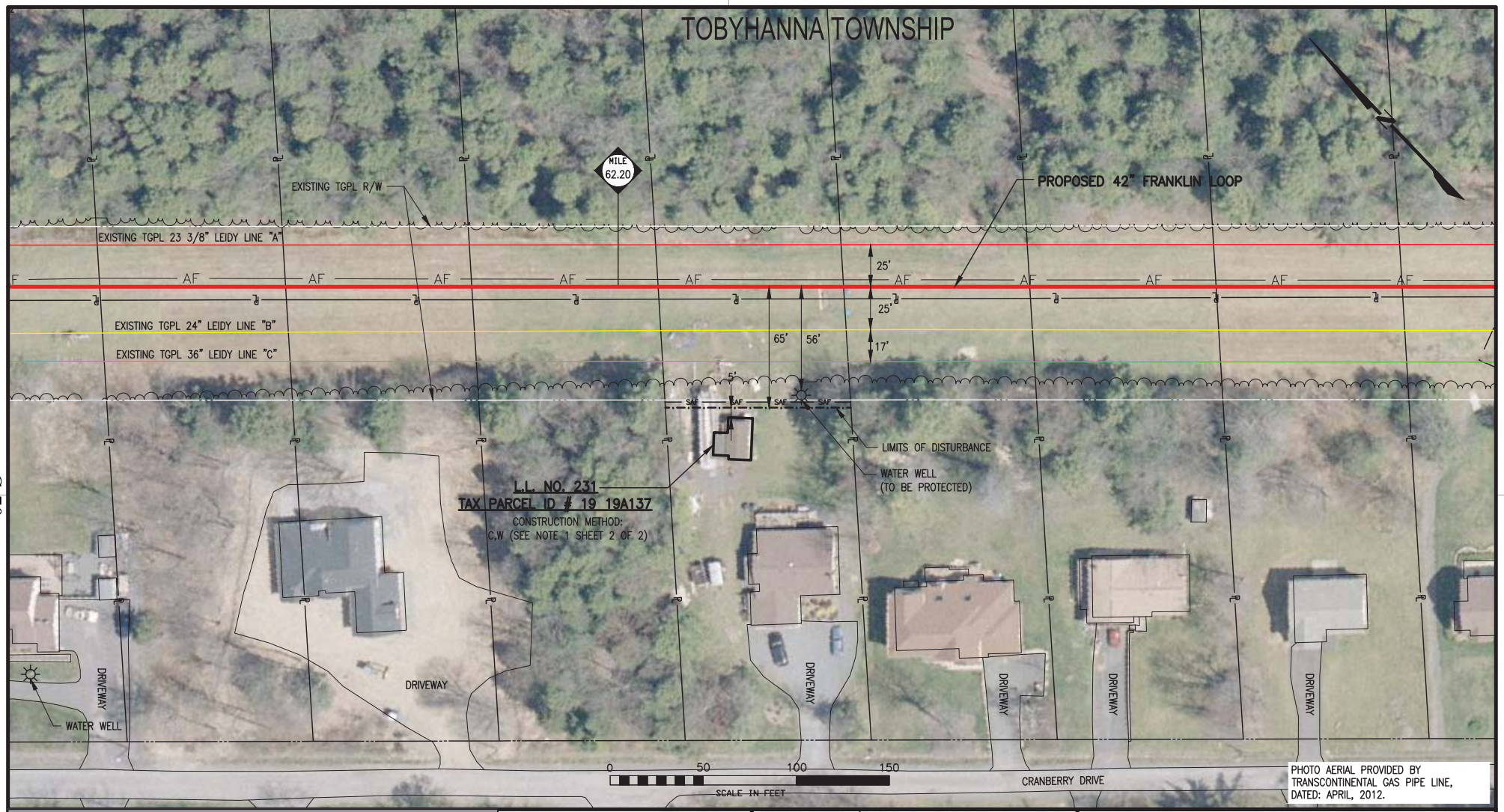
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.14-D	SHEET 1 OF 2
W.O: 1129991		12:59pm 1/14/2014 ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.14-D.DWG	

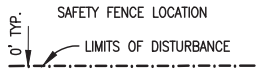


C-70

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

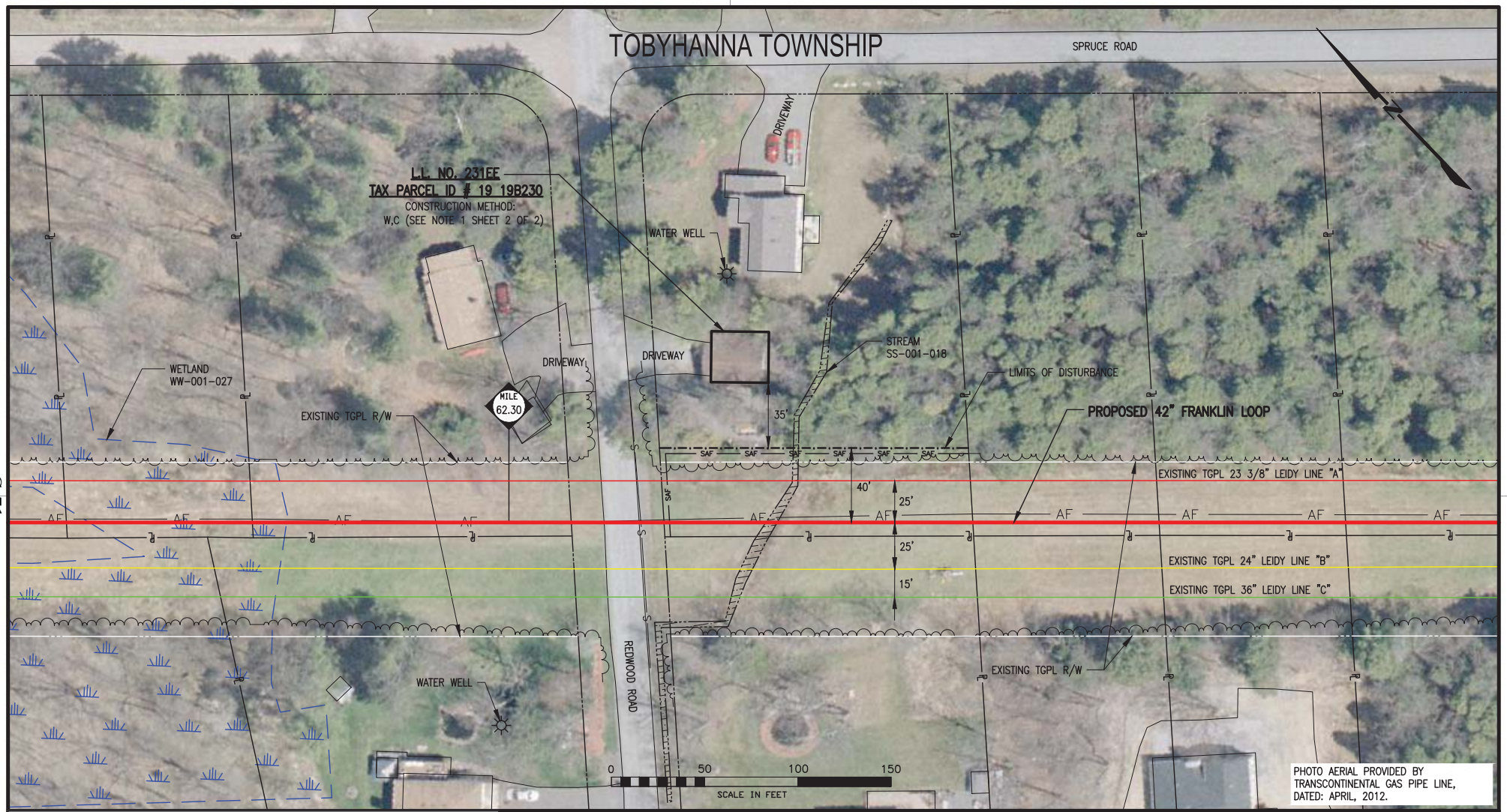
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

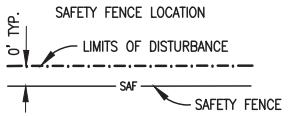
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.19-D	SHEET 1 OF 2
W.O.: 1129991		1/16/2014 1:05pm mlho K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.19-D.DWG	



C-71

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231EE
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.27-D	SHEET 1 OF 2
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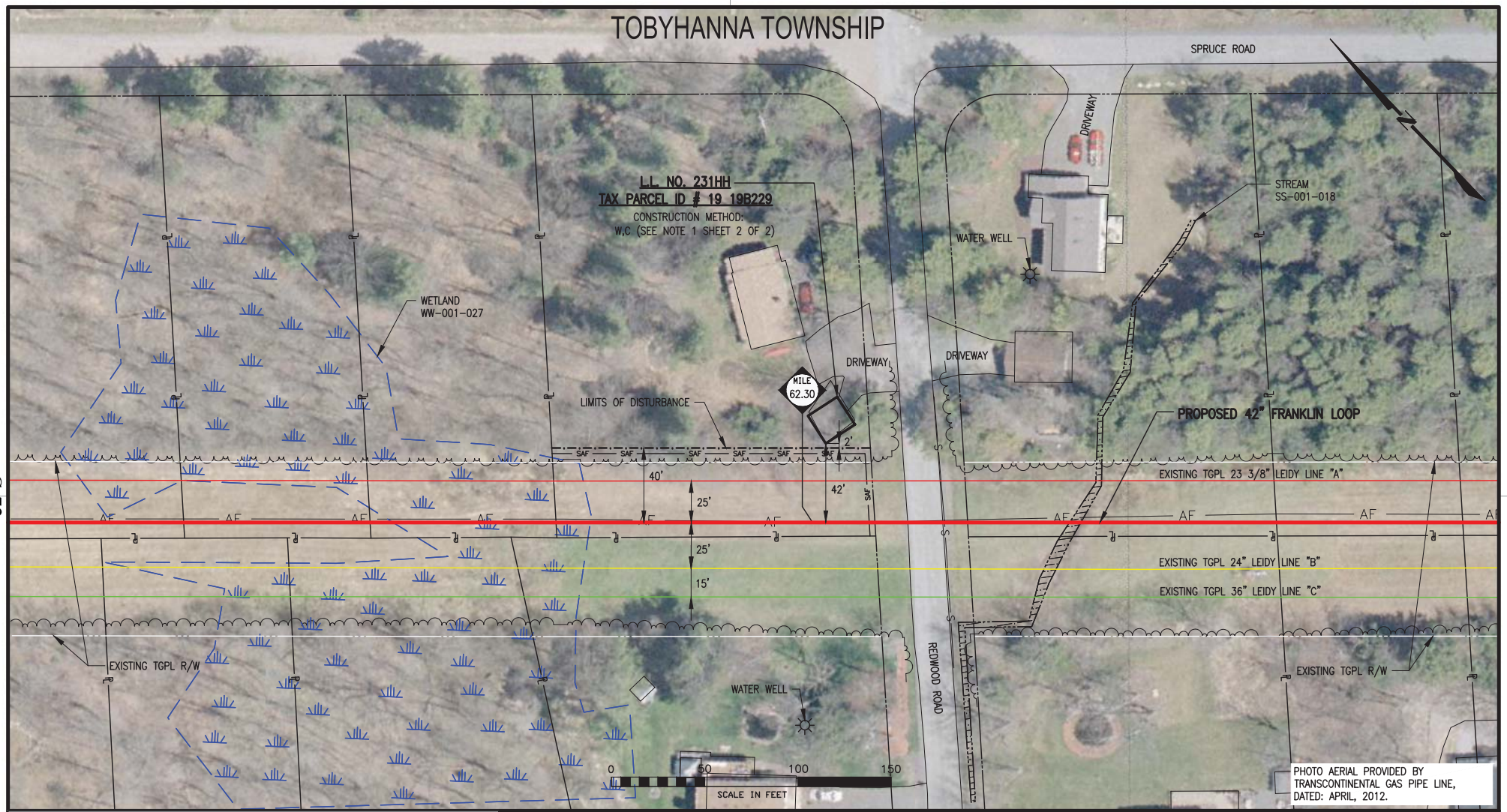
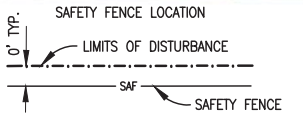


C-72

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



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DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231HH
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.30-D	SHEET 1 OF 2
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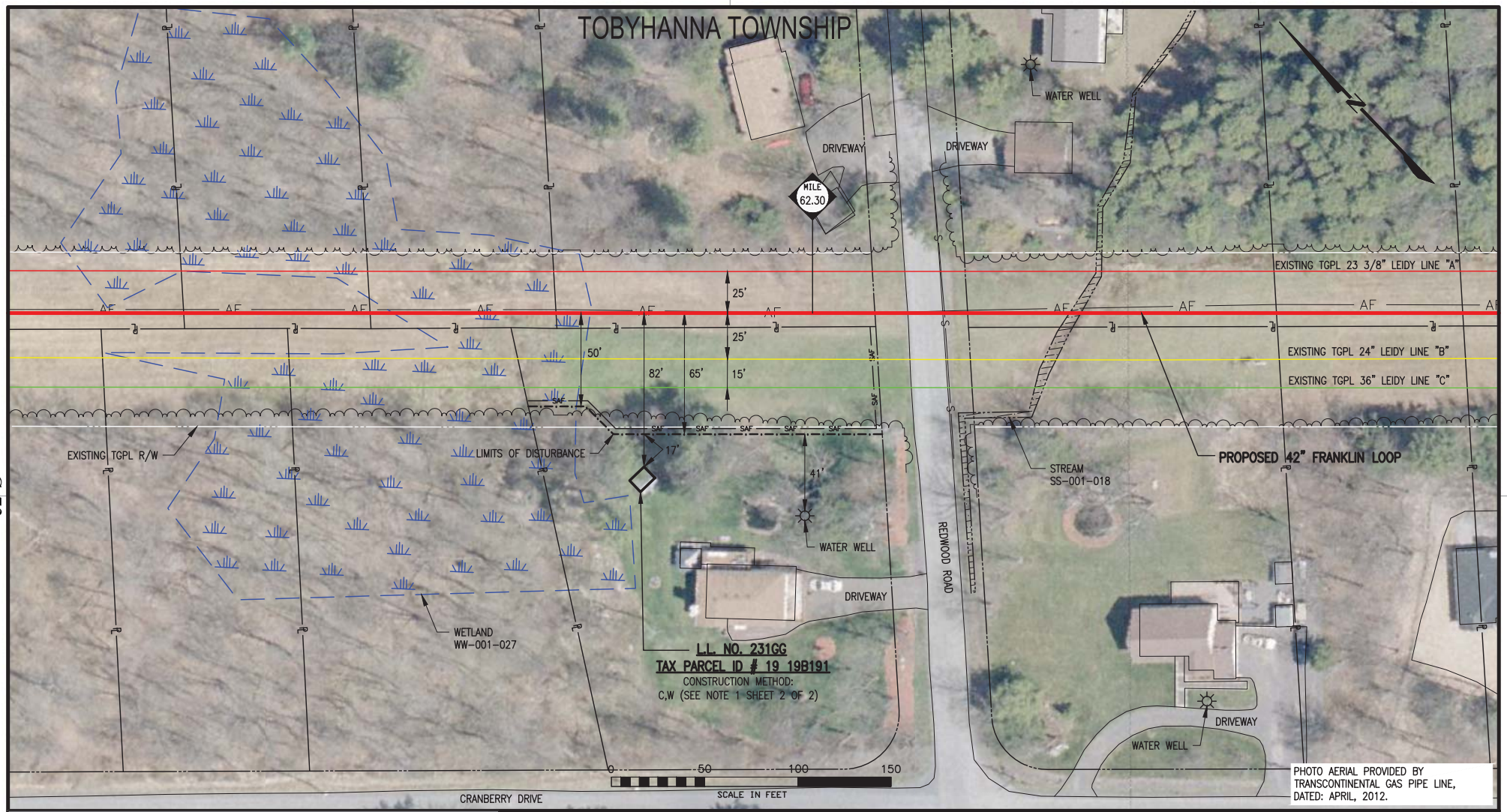
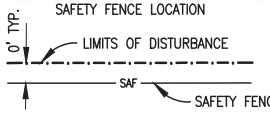


C-73

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

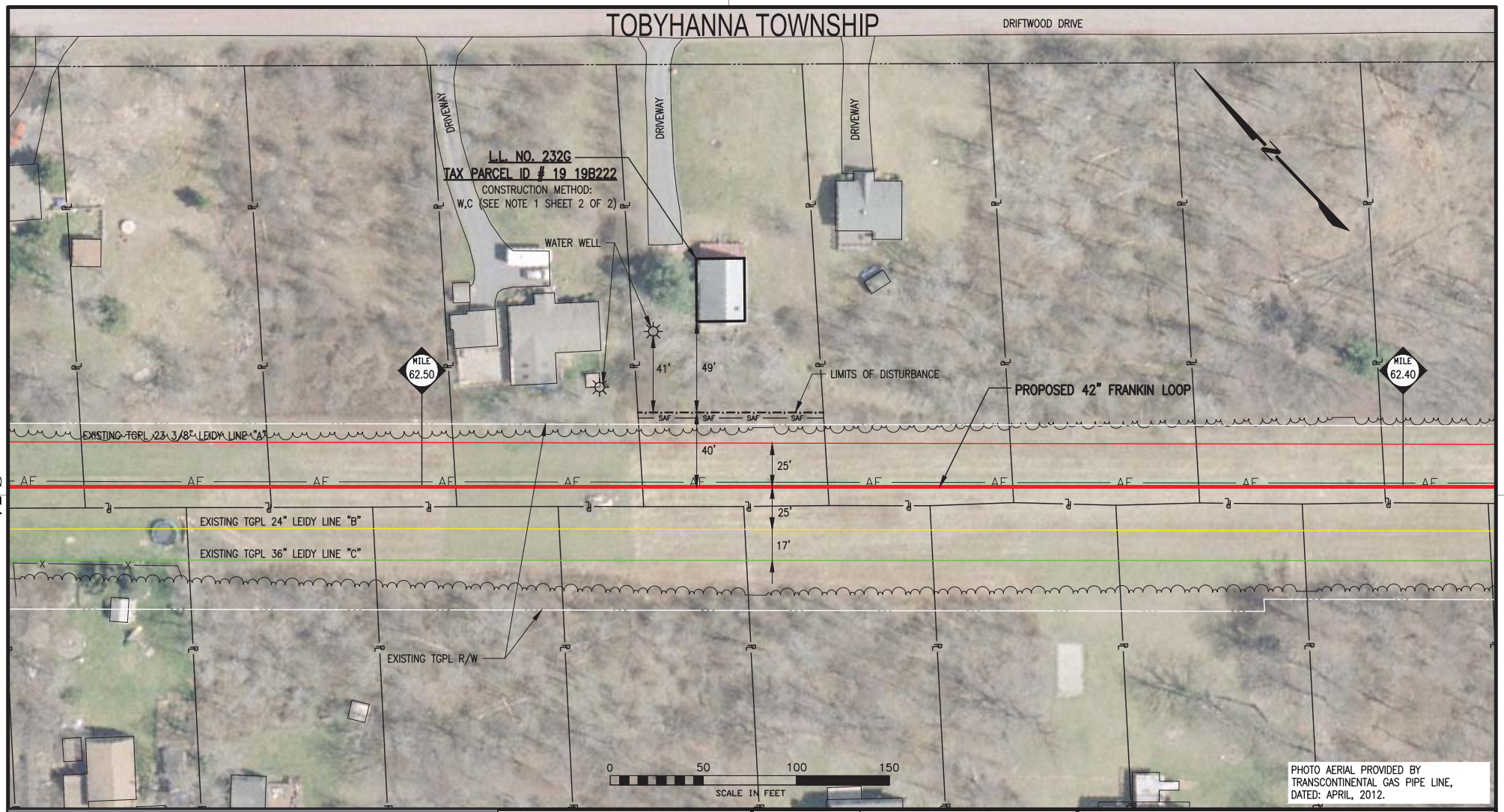
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 231GG
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.31-D	SHEET 1 OF 2
W.O: 1129991		1/21/2014 3:09pm mtho K:\20345 --Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.31-D.DWG	

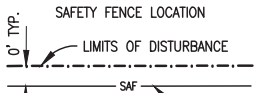


C-74

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

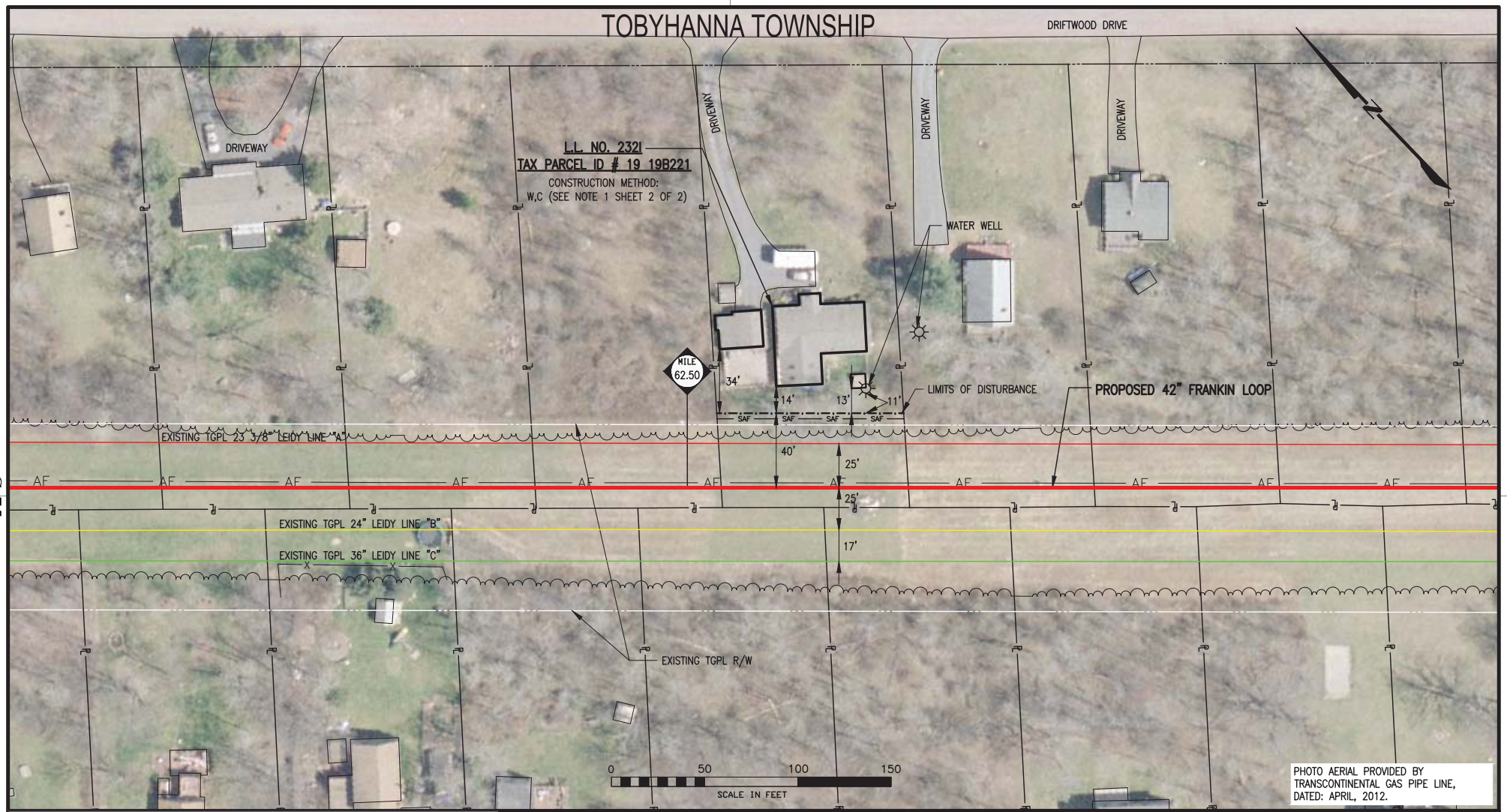
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 232G
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

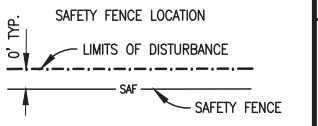
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.47-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 2:48pm ctland K:\20345 --Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.47-D.DWG	



C-75

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- O UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

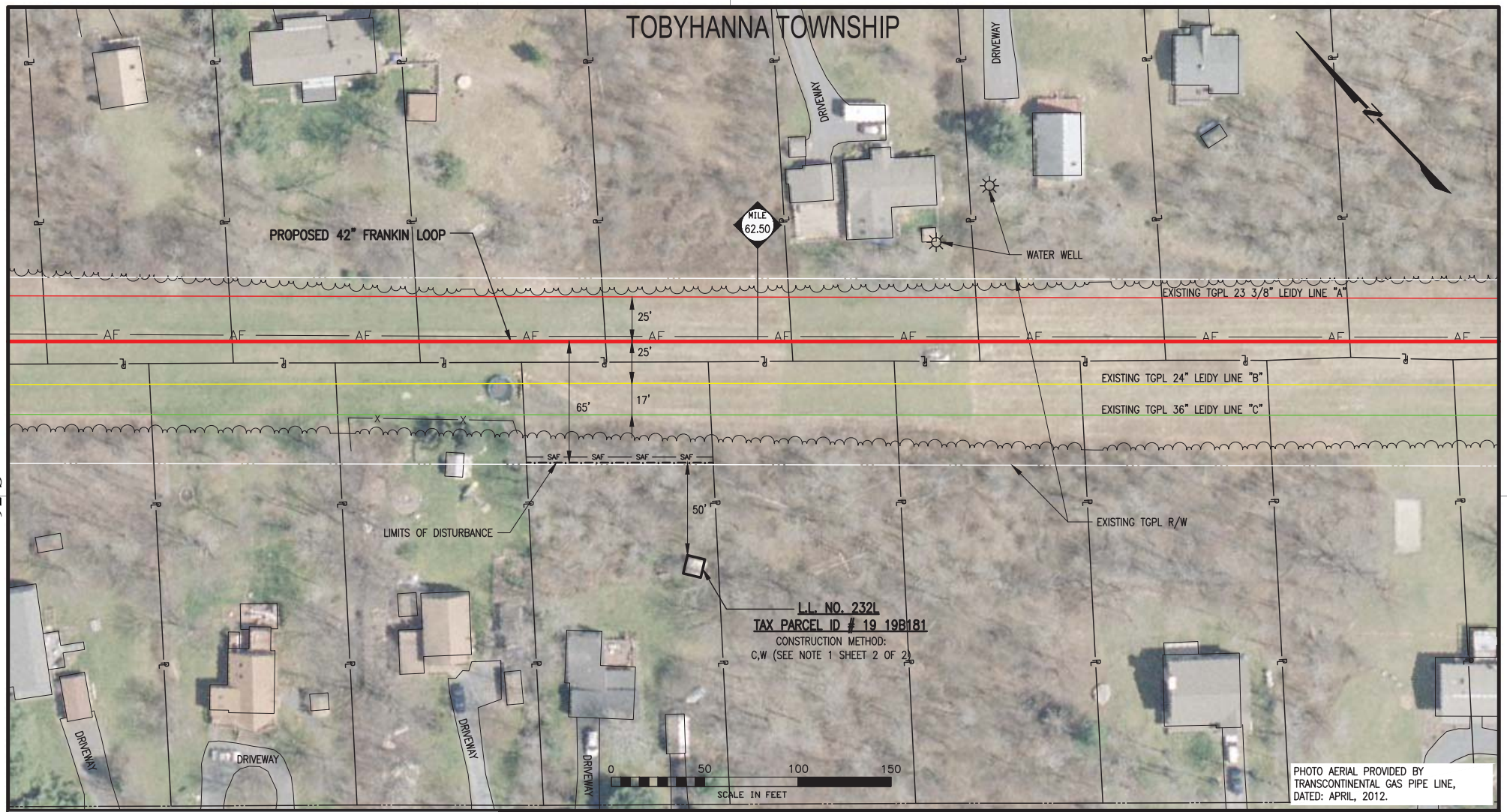
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 2321
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

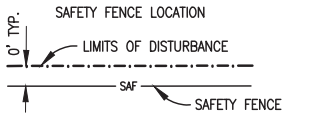
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.49-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 2:53pm ctland K:\20345 --Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.49-D.DWG	



C-76

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

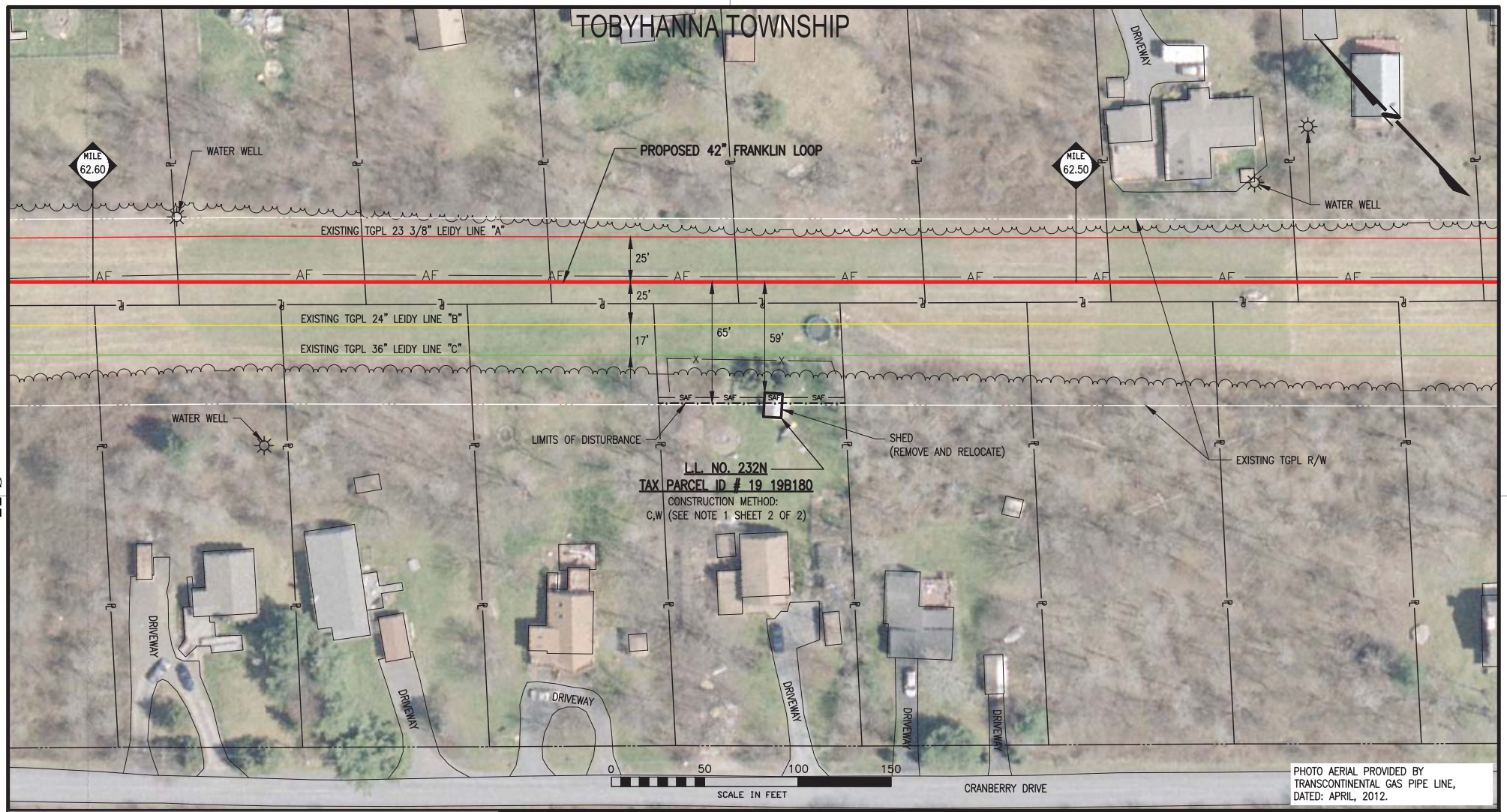
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 232L
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.50-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 3:05pm ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.50-D.DWG	

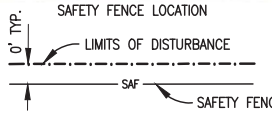


C-77

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

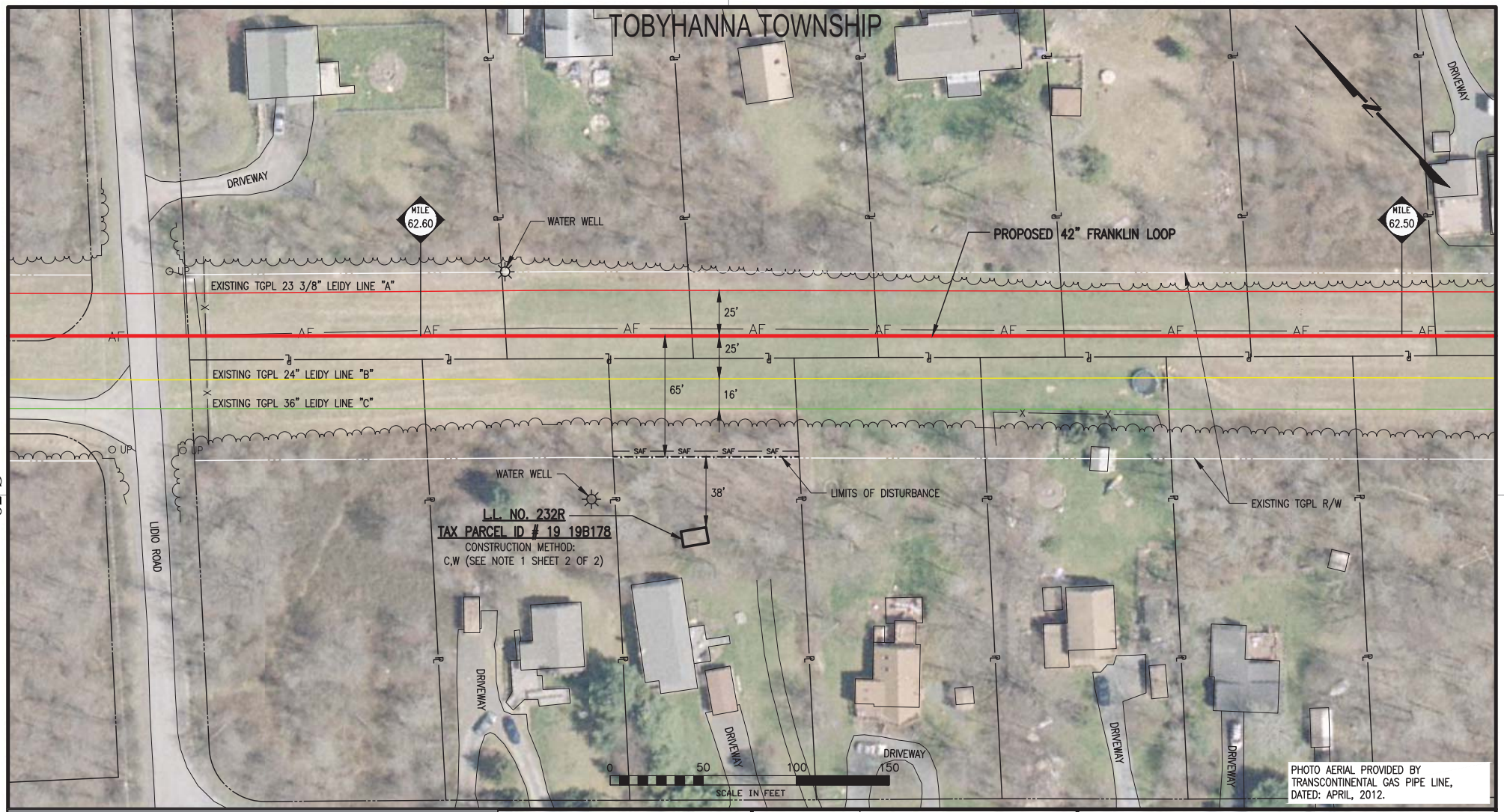
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 232N
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

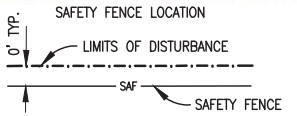
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.53-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 3:11 pm ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.53-D.DWG	



C-78

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

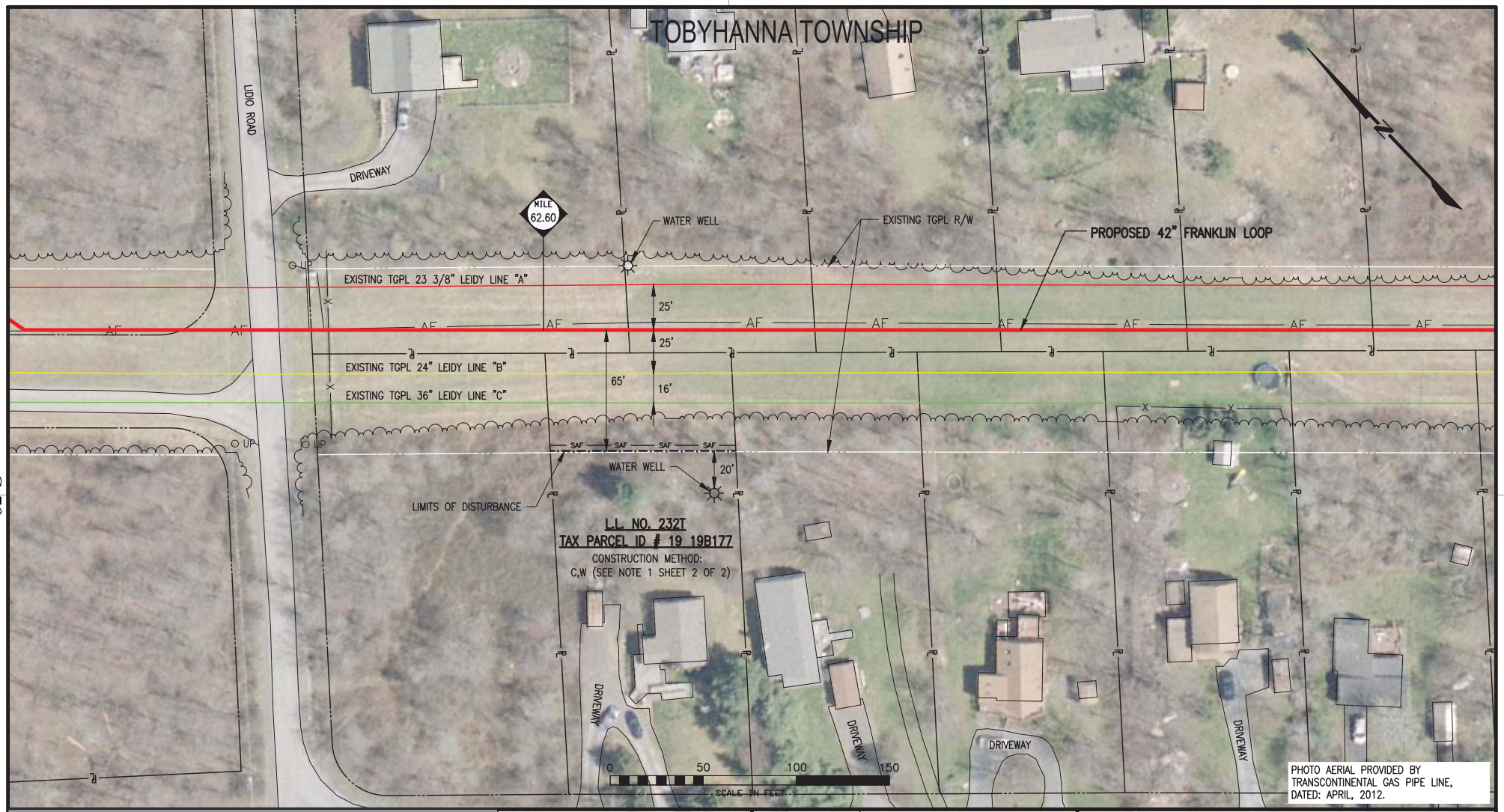
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 232R
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

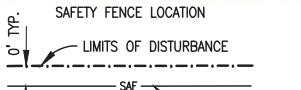
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.57-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 3:31pm ctland K:\20345 --Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.57-D.DWG	



C-79

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

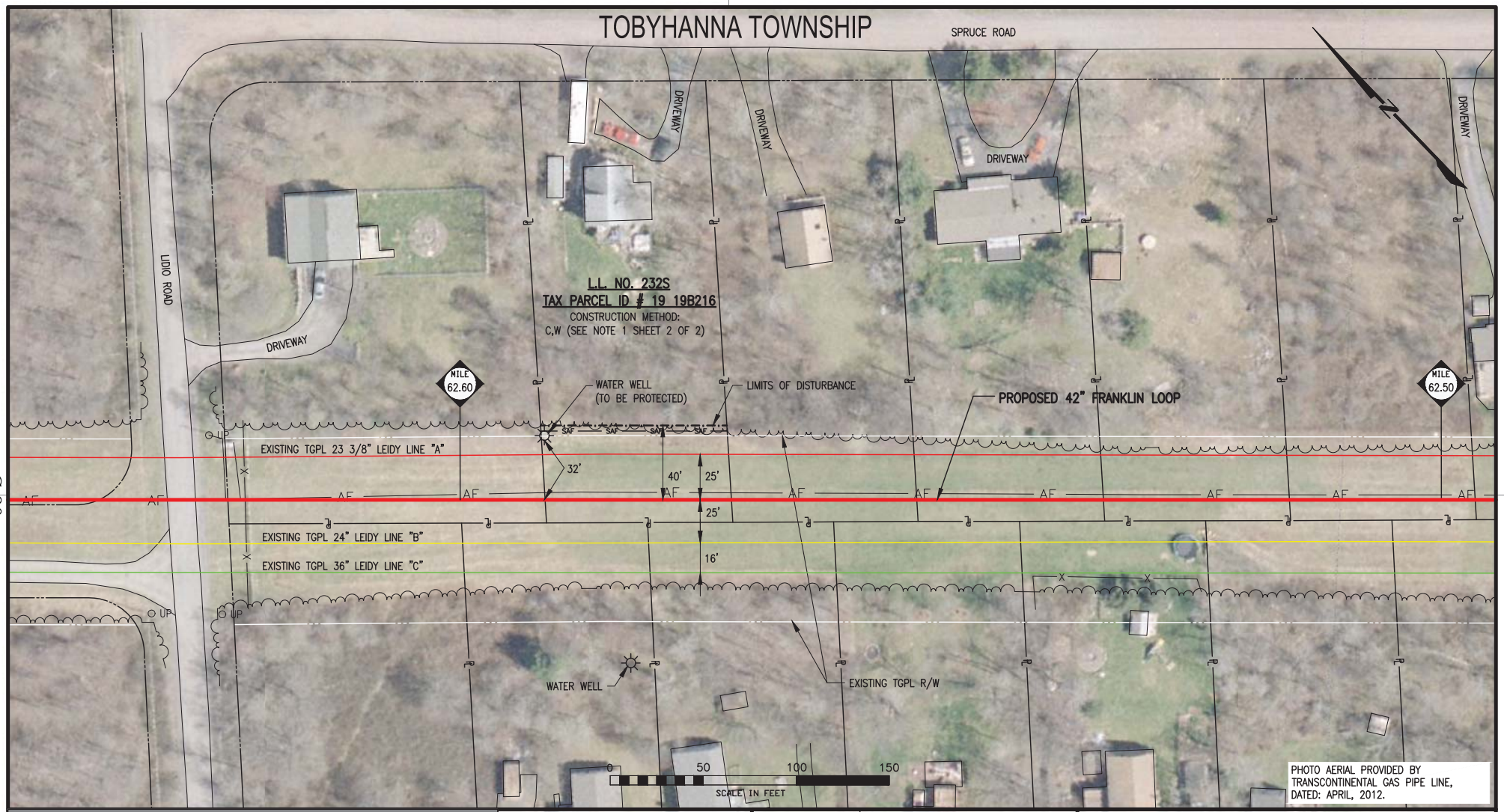
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH
1	9/18/13	WGM	ISSUED FOR FINAL REVIEW	1129991	JD	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	JD	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	JD	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 232T
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.58-D	SHEET 1 OF 2
W.O: 1129991		1/17/2014 2:49pm mtho K:\20345 -Franklin Loop\Mapping\Property Plats\RCP\25-06-1000_62.58-D.DWG	

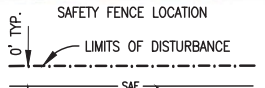


C-80

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- EXISTING FENCE
- SANITARY SEWER
- WATER LINE
- UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

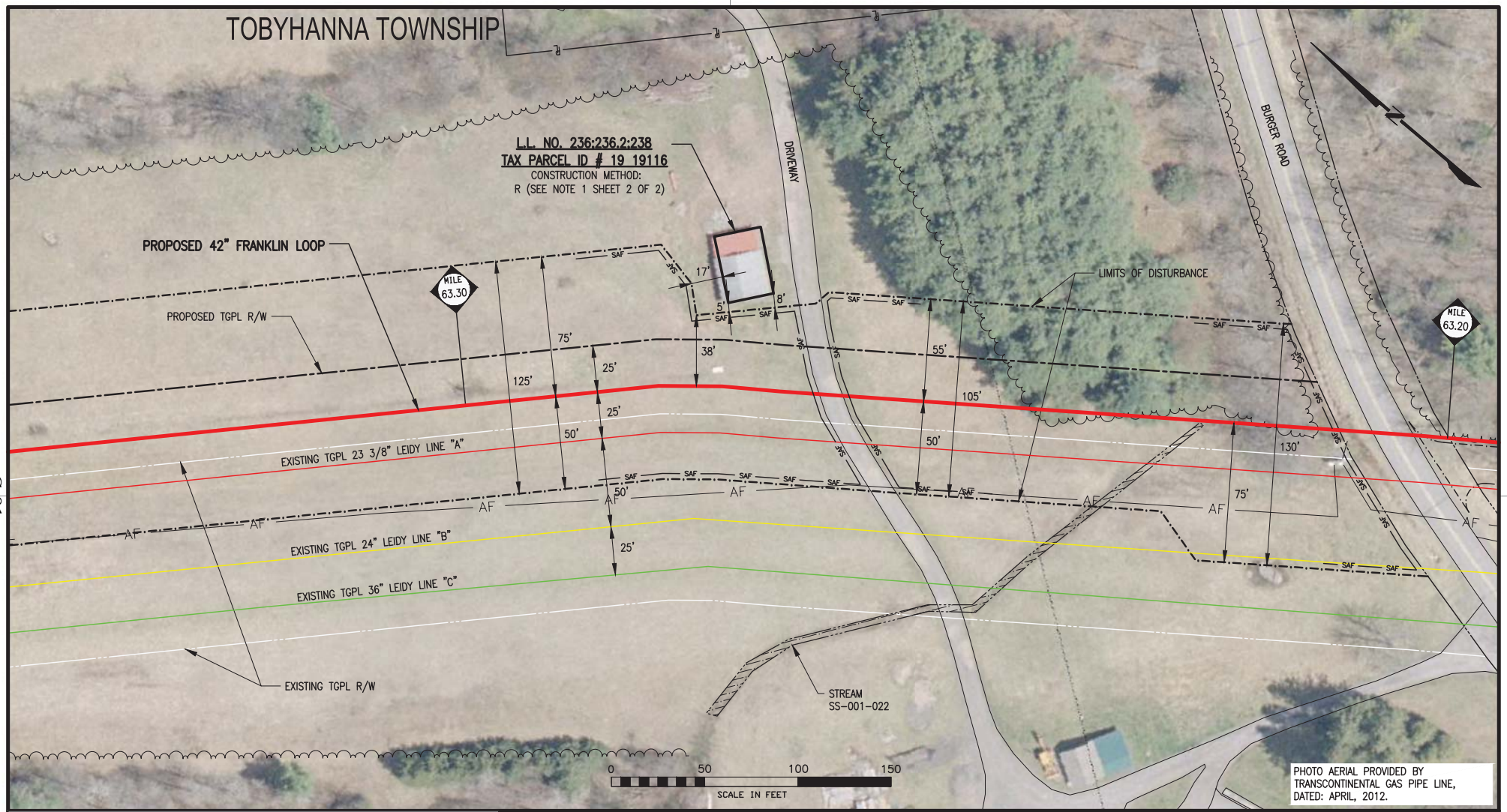
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 232S
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

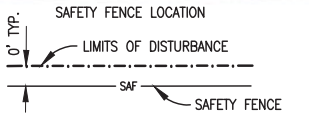
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/62.59-D	SHEET 1 OF 2
W.O.: 1129991		1/14/2014 3:45pm ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_62.59-D.DWG	



C-81

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

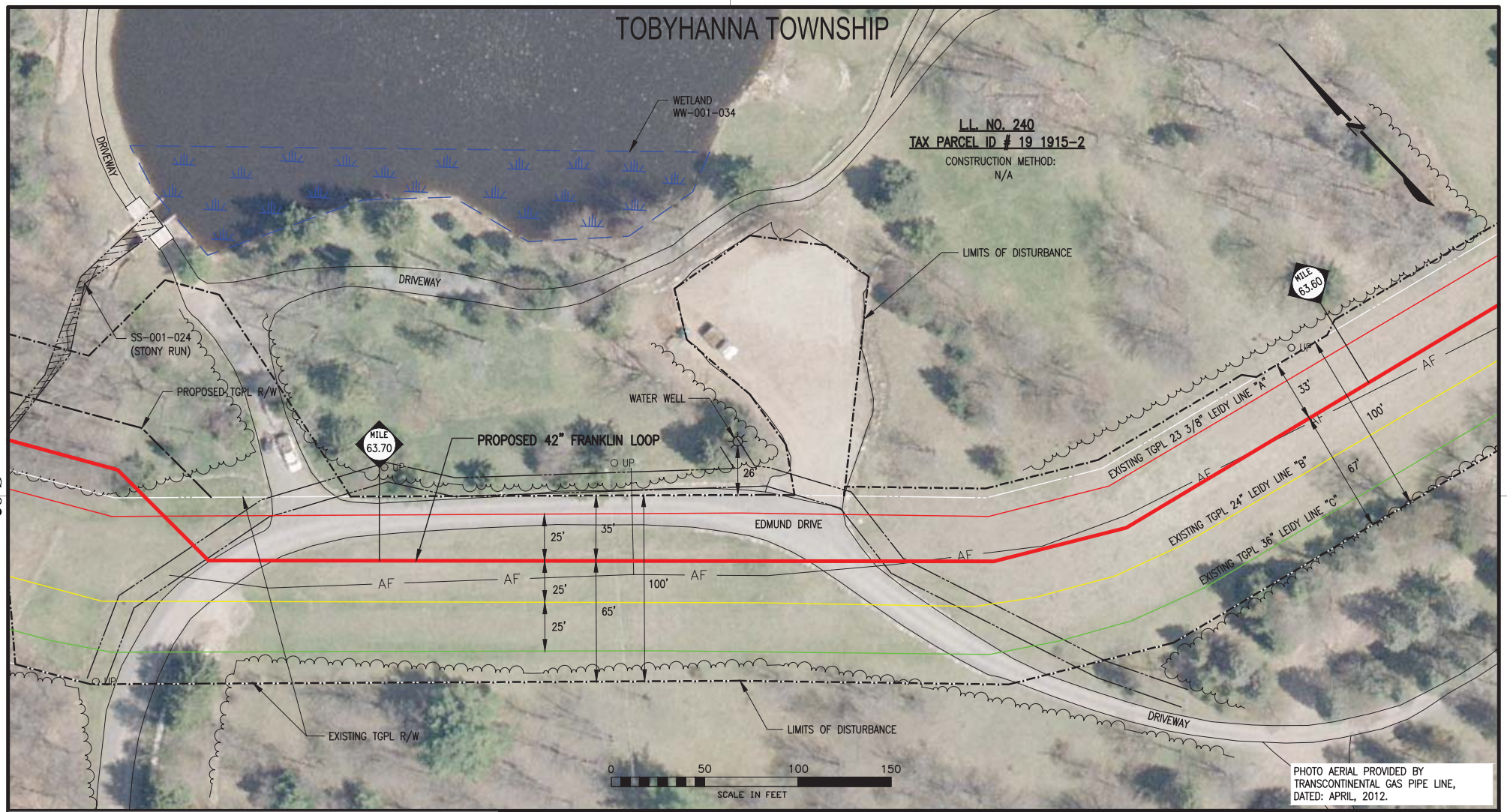
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 236;236.2;238
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/63.27-D	SHEET 1 OF 2
W.O. 1129991		1/14/2014 3:58pm ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_63.27-D.DWG	

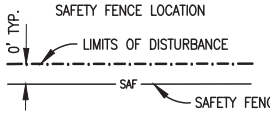


C-82

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

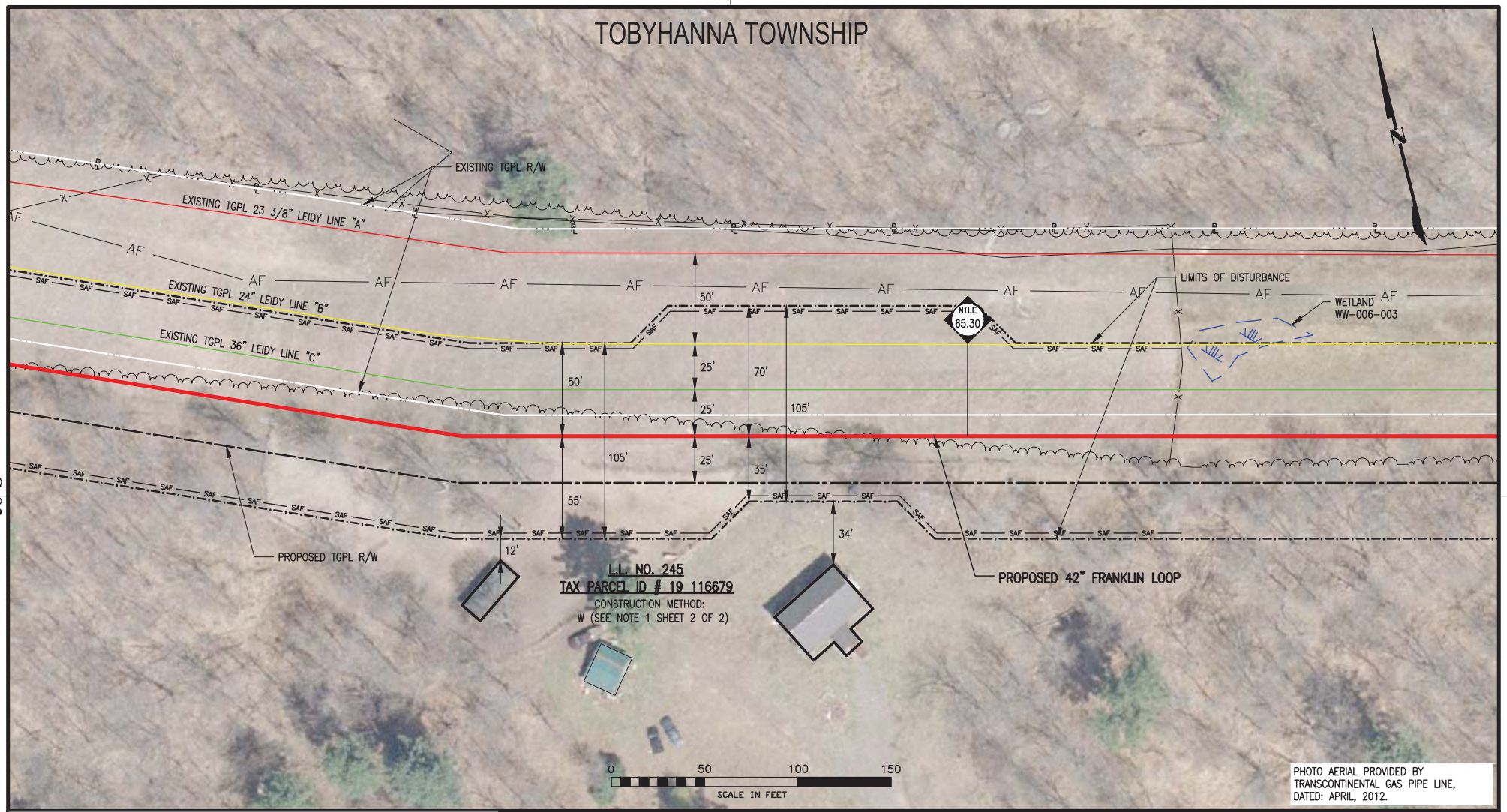
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 240
MONROE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/63.67-D	SHEET 1 OF 2
W.O.: 1129991		1/15/2014 7:08am K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_63.67-D.DWG	ctland

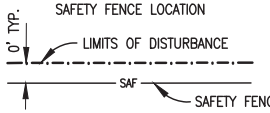


C-83

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 245
MONROE COUNTY, PENNSYLVANIA

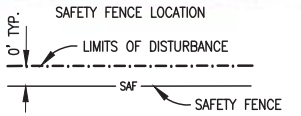
Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/65.31-D	SHEET 1 OF 2
W.O.: 1129991		1/15/2014 7:19am ctland K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_65.31-D.DWG	

C-84

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH
1	9/18/13	WGM	ISSUED FOR FINAL REVIEW	1129991	JD	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	JD	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	JD	MJH
4	1/17/14	WGM	ISSUED FOR SUPP FINAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 248
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

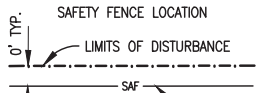
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/65.84-D	SHEET 1 OF 2
W.O. 1129991		1/18/2014 12:43pm mlho K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_65.84-D(Road).DWG	

C-85

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

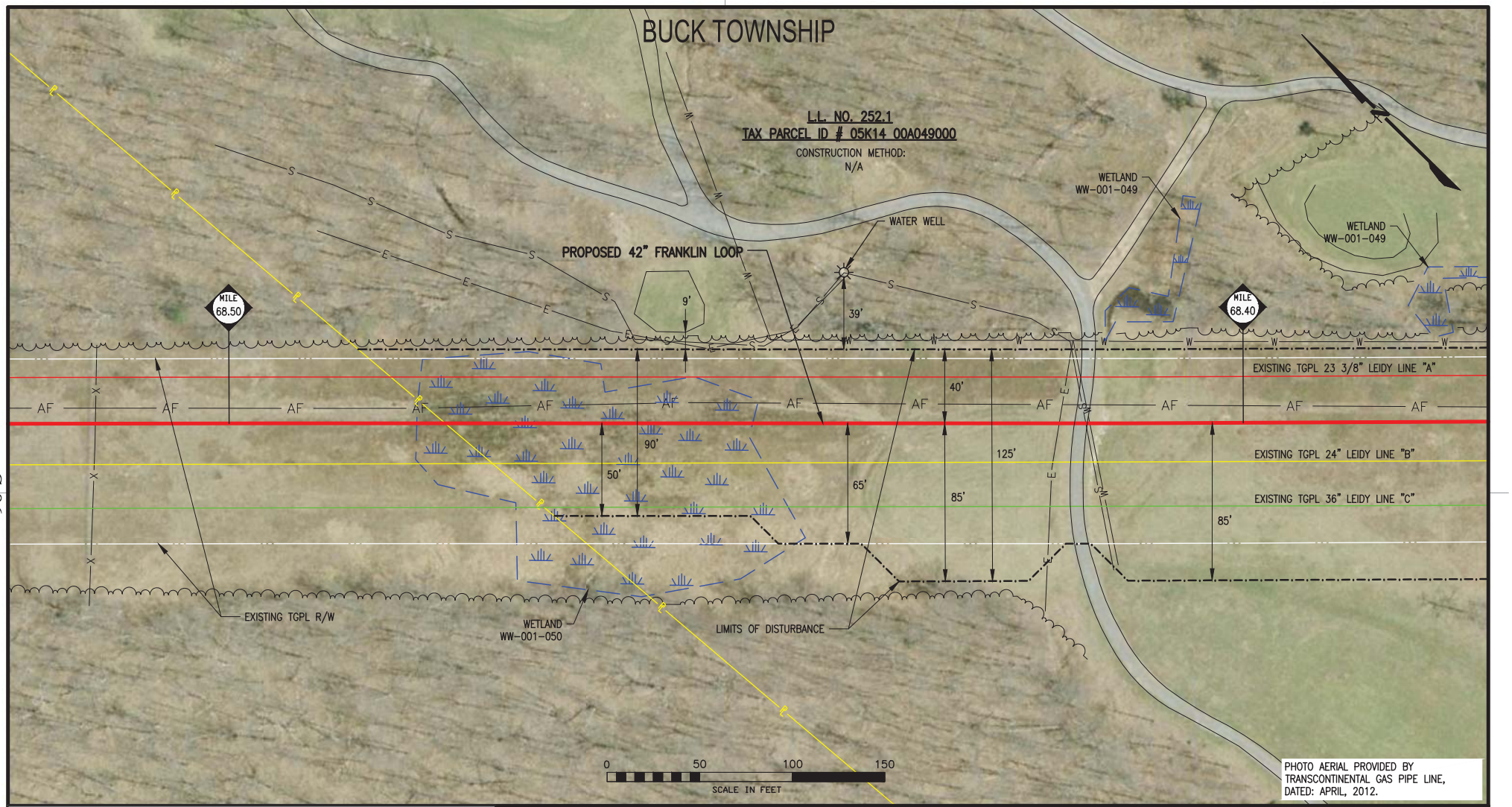
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH
2	9/16/13	WGM	ISSUED FOR FERC FILING	1129991	BE	MJH
1	8/30/13	WGM	REISSUED FOR FERC FILING	1129991	BE	MJH
0	8/7/13	WGM	ISSUED FOR SUPP PERMIT FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 251.1
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/67.86-D	SHEET 1 OF 2
W.O. 1129991		1/17/2014 7:35am mtho K:\20345 --Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_67.86-D(Road).DWG	

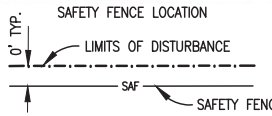


C-86

LEGEND

- PROPOSED 42" FRANKLIN LOOP
- EXISTING TGPL 23 3/8" LEIDY LINE "A"
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129991	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129991	BB	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129991	BB	MJH
3	9/30/13	WGM	REISSUED FOR FERC FILING	1129991	BB	MJH
4	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129991	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" FRANKLIN LOOP
FOR PROPERTY OF L.L. NO. 252.1
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/68.44-D	SHEET 1 OF 2
W.O: 1129991		1/27/2014 9:05am mlho K:\20345 -Franklin Loop\Mapping\Property Plats\ROP\25-06-1000_68.44-D.DWG	

Transcontinental Gas Pipe Line Company, LLC.

LEIDY SOUTHEAST PROJECT

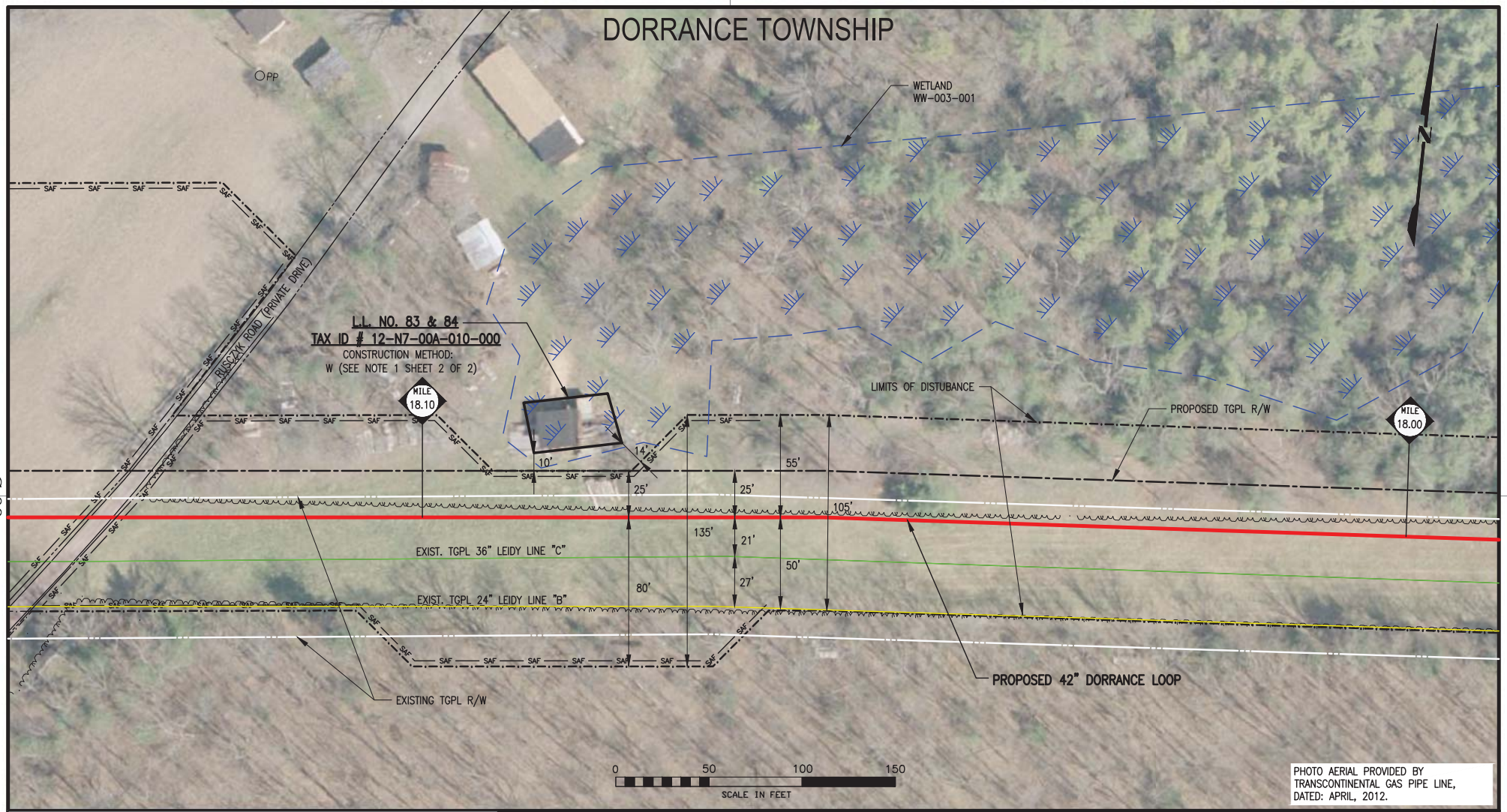
PROPOSED 42" DORRANCE LOOP

LUZERNE COUNTY, PENNSYLVANIA

RESIDENTIAL CONSTRUCTION PLAN

5.27 MI. 42" PIPELINE – M.P. 17.70 TO M.P. 22.97

DATE: 1-17-2014



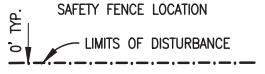
C-88

PHOTO AERIAL PROVIDED BY TRANSCONTINENTAL GAS PIPE LINE, DATED: APRIL, 2012.

LEGEND

- PROPOSED 42" DORRANCE LOOP
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

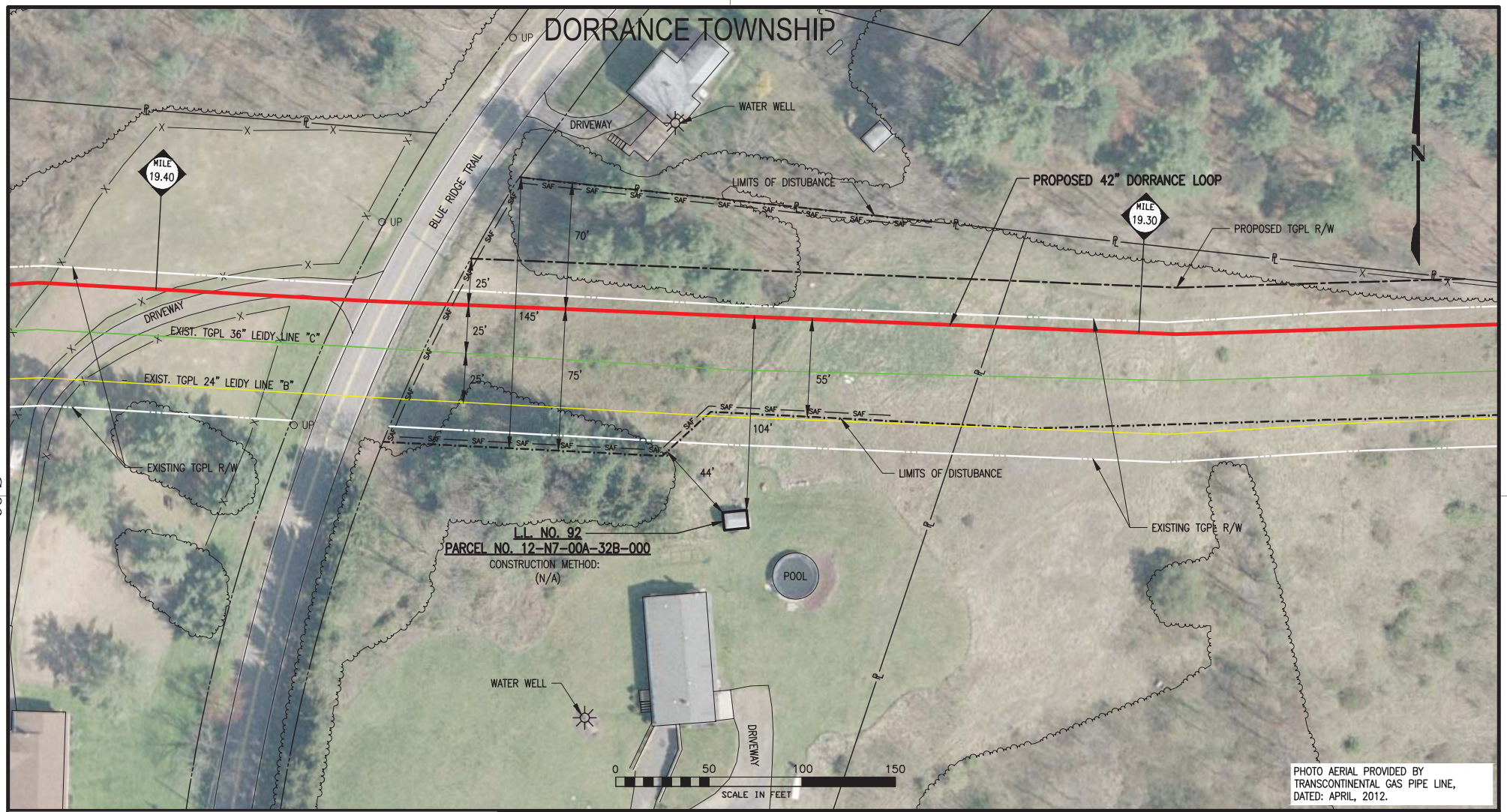
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129781	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JM	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 83 & 84
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

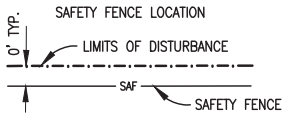
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/18.09-D	SHEET 1 OF 2
W.O.: 1129781		1/14/2014 8:12am wtland K:\20344 – Dorrance Loop\Mapping\Property Plats\RCP\25-06-1000_18.09-D.DWG	



C-89

LEGEND

- PROPOSED 42" DORRANCE LOOP
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

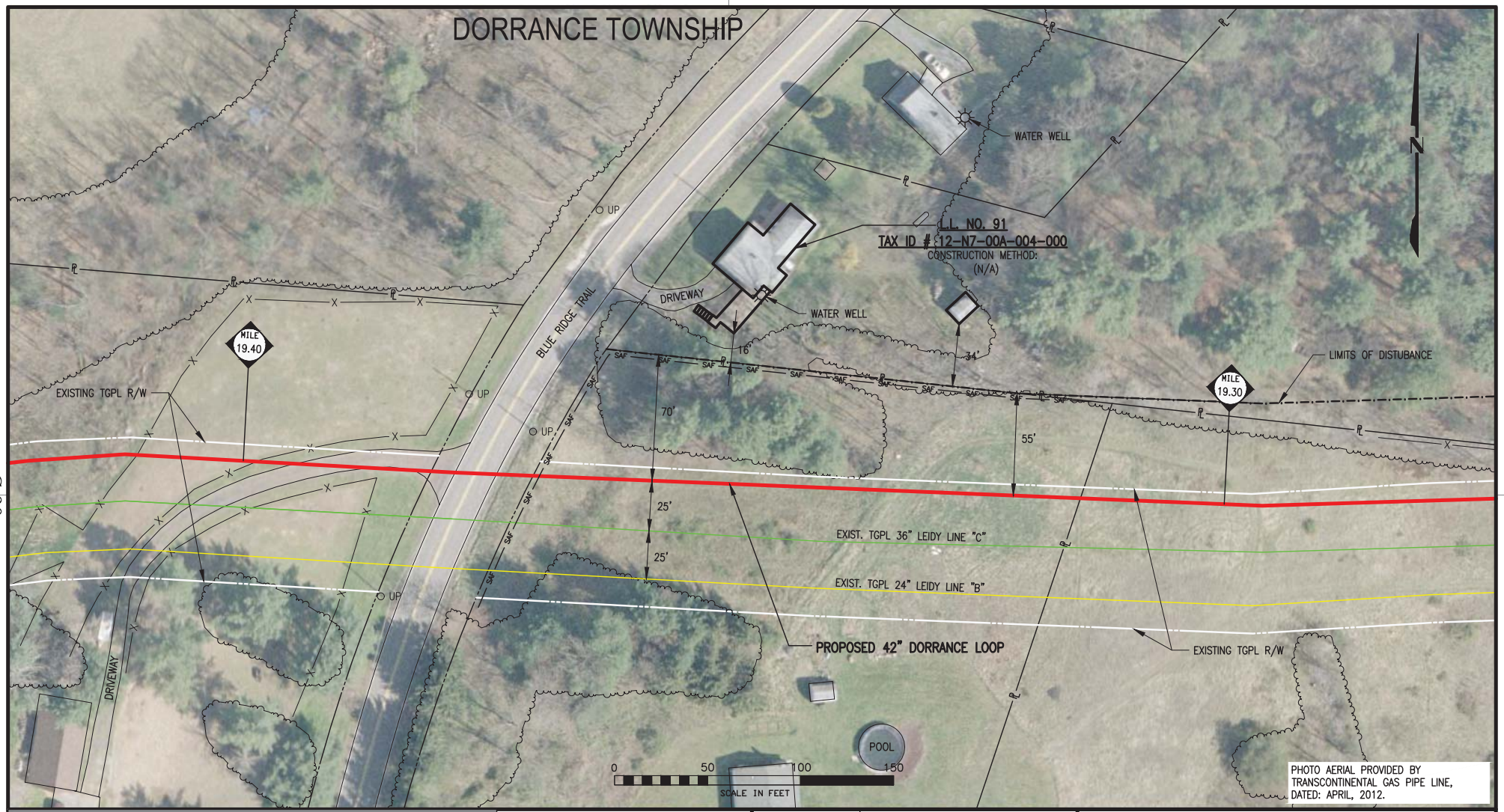
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129781	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JM	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 92
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

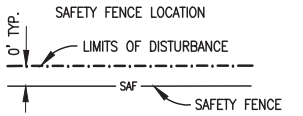
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/19.34-D	SHEET 1 OF 2
W.O. 1129781		1/14/2014 wtland K:\20344 – Dorrance Loop\Mapping\Property Plats\RCP\25-06-1000_19.34-D.DWG	



C-90

LEGEND

- PROPOSED 42" DORRANCE LOOP
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129781	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JM	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 91
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

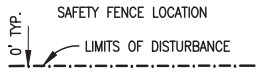
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/19.35-D	SHEET 1 OF 2
W.O: 1129781		1/14/2014 8:37:am K:\20344 – Dorrance Loop\Mapping\Property Plats\RCP\25-06-1000_19.35-D.DWG	wtland

C-91

LEGEND

- PROPOSED 42" DORRANCE LOOP
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE

SAFETY FENCE LOCATION



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

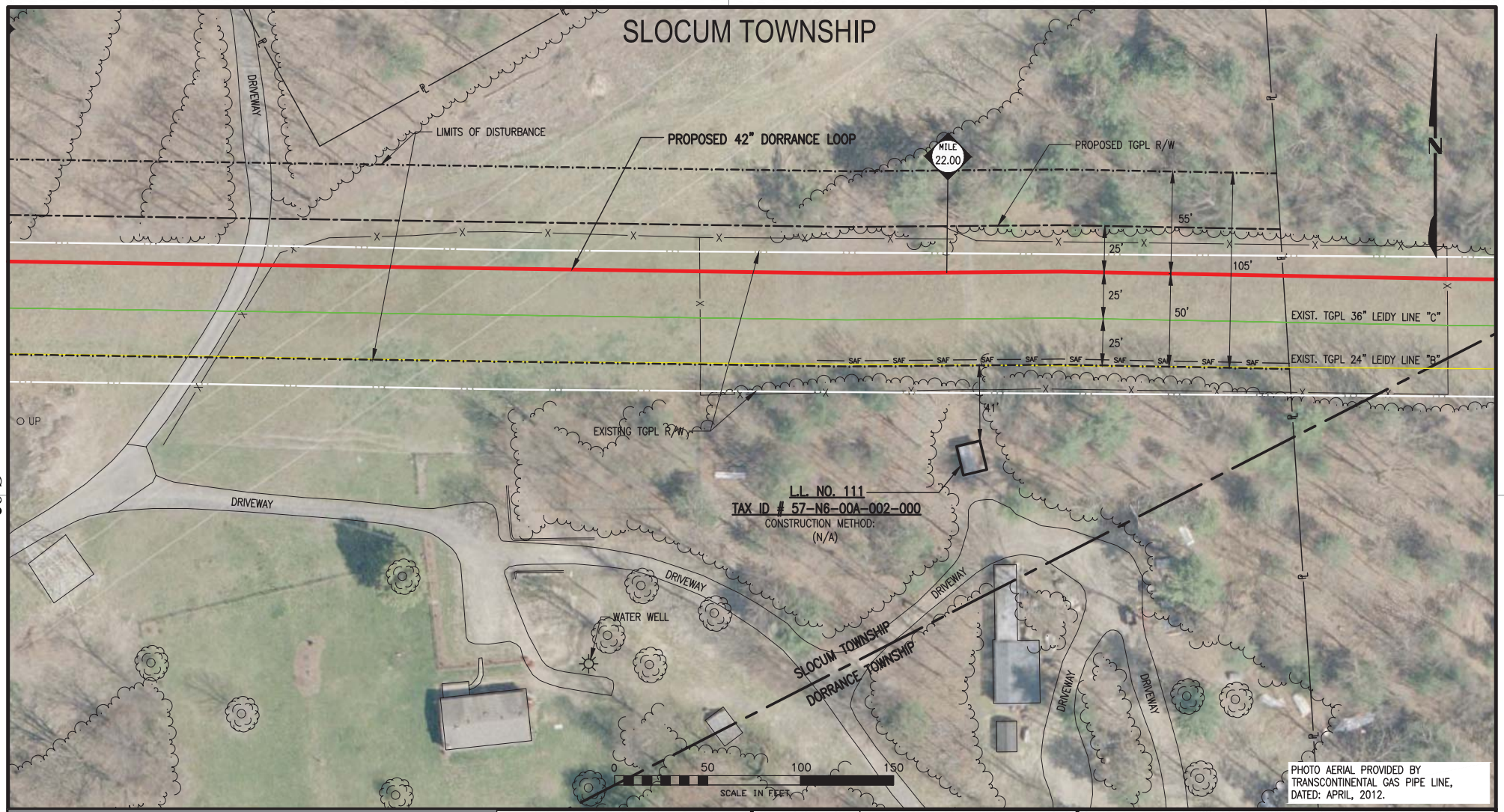
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH
1	8/19/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JD	MJH
2	8/16/13	WGM	ISSUED FOR FERC FILING	1129781	JD	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 97, 99 & 101
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

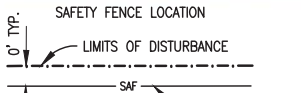
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/19.82-D	SHEET 1 OF 2
W.O: 1129781		1/16/2014 2:40pm mtho K:\20344 – Dorrance Loop\Mapping\Property Plats\RCP\KEEP 25-06-1000_19.82-D NOT IN PACKAGE.DWG	



C-92

LEGEND

- PROPOSED 42" DORRANCE LOOP
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

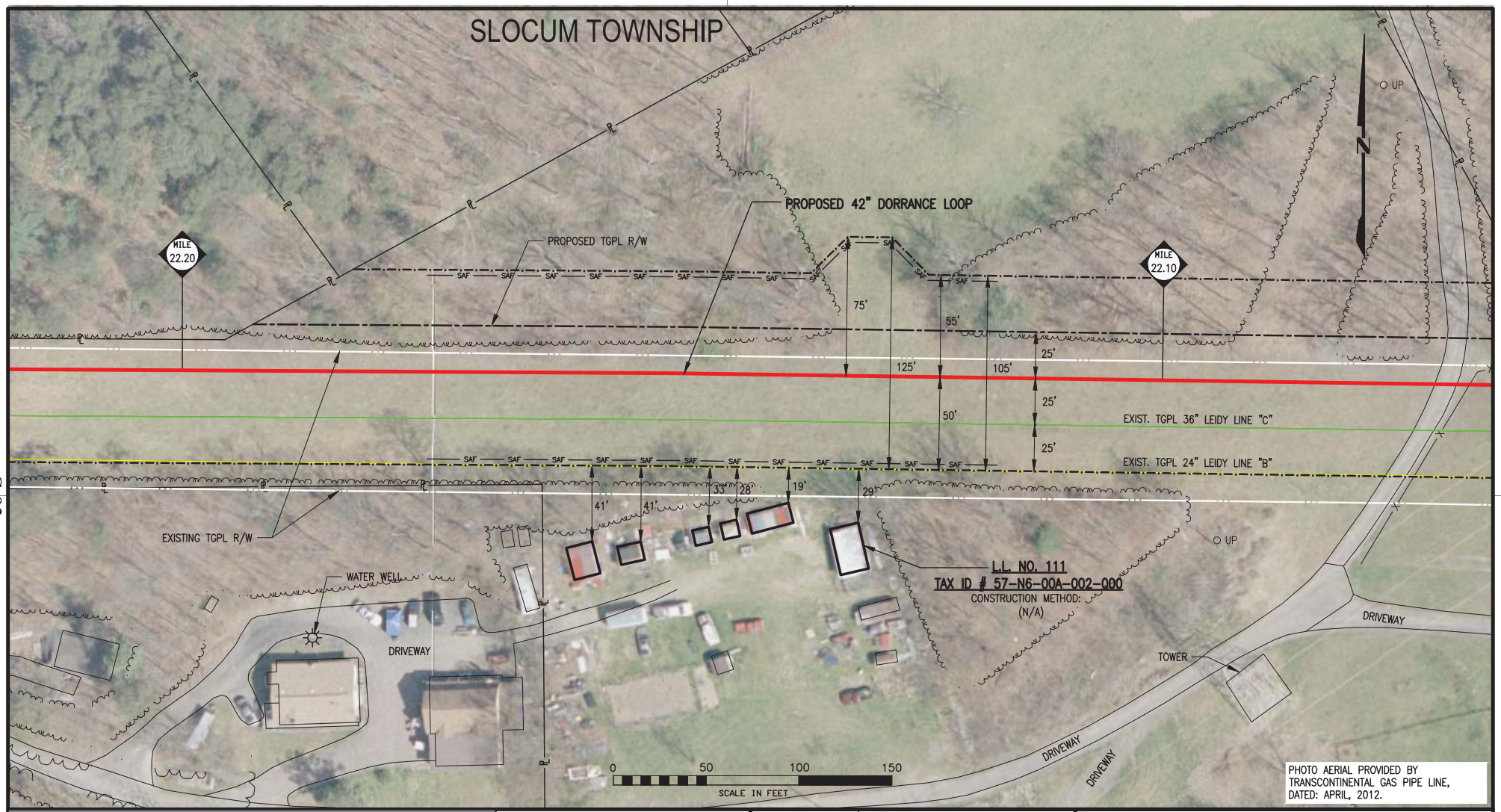
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129781	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JM	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 111
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

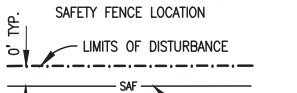
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-1000-06/22.00-D	SHEET 1 OF 2
W.O.: 1129781		R:40cm 1/14/2014 wtland K:\20344 – Dorrance Loop\Mapping\Property Plats\RCP\25-06-1000_22.00-D.DWG	



C-93

LEGEND

- PROPOSED 42" DORRANCE LOOP
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

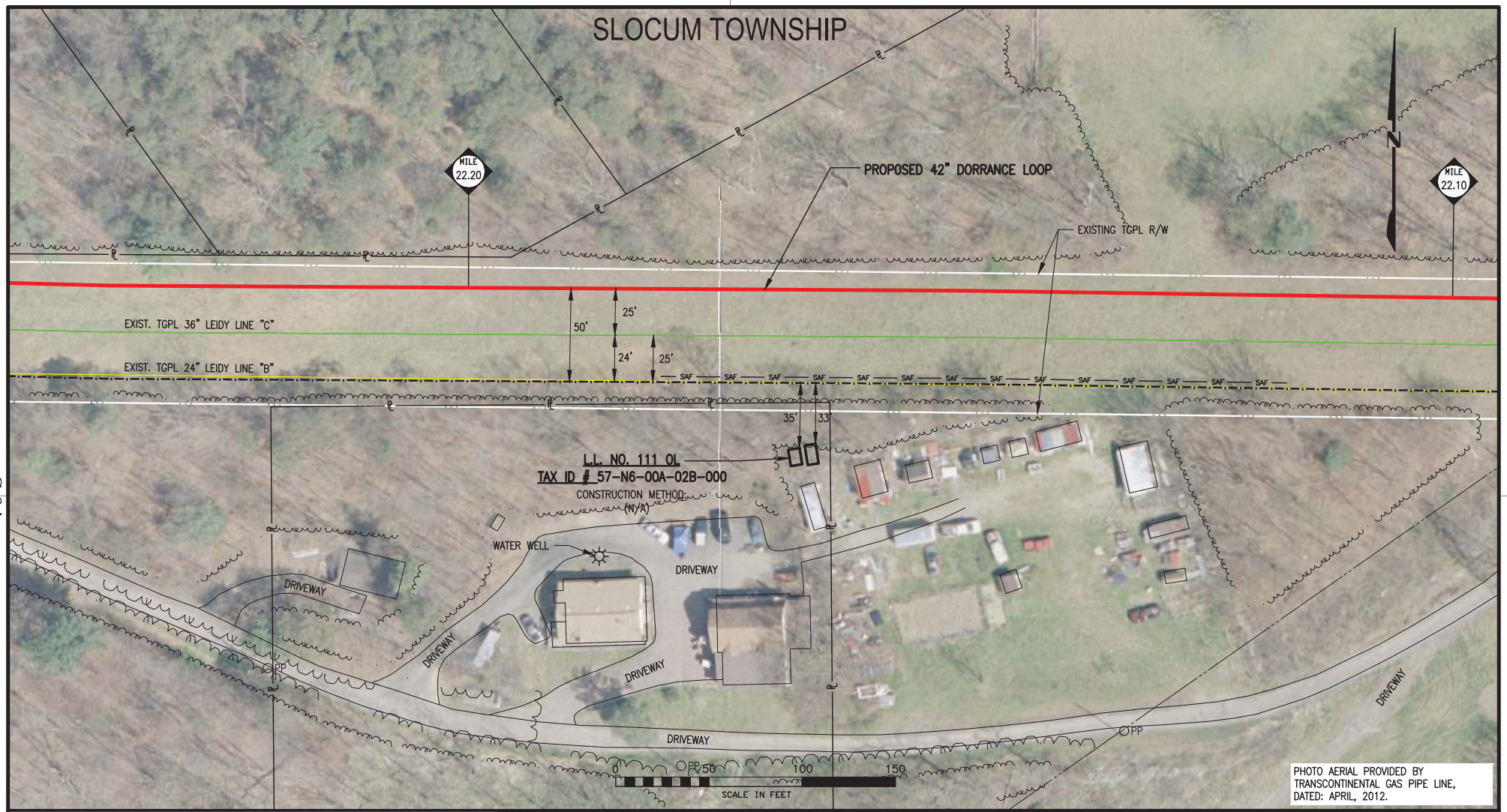
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	WGM	ISSUED FOR SUBMITTAL	1129781	BB	MJH
1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JM	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 111
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

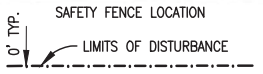
DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/22.15-D	SHEET 1 OF 2
W.O. 1129781		1/14/2014 wtland K:\20344 – Dorrance Loop\Mapping\Property Plats\RCP\25-06-1000_22.15-D.DWG	



C-64

LEGEND

- PROPOSED 42" DORRANCE LOOP
- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
- X — EXISTING FENCE
- S — SANITARY SEWER
- W — WATER LINE
- UP — UTILITY POLE



THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
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1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JM	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 111 OL
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14	DRAWING NUMBER: 25-06-1000/22.16-D	SHEET 1 OF 2
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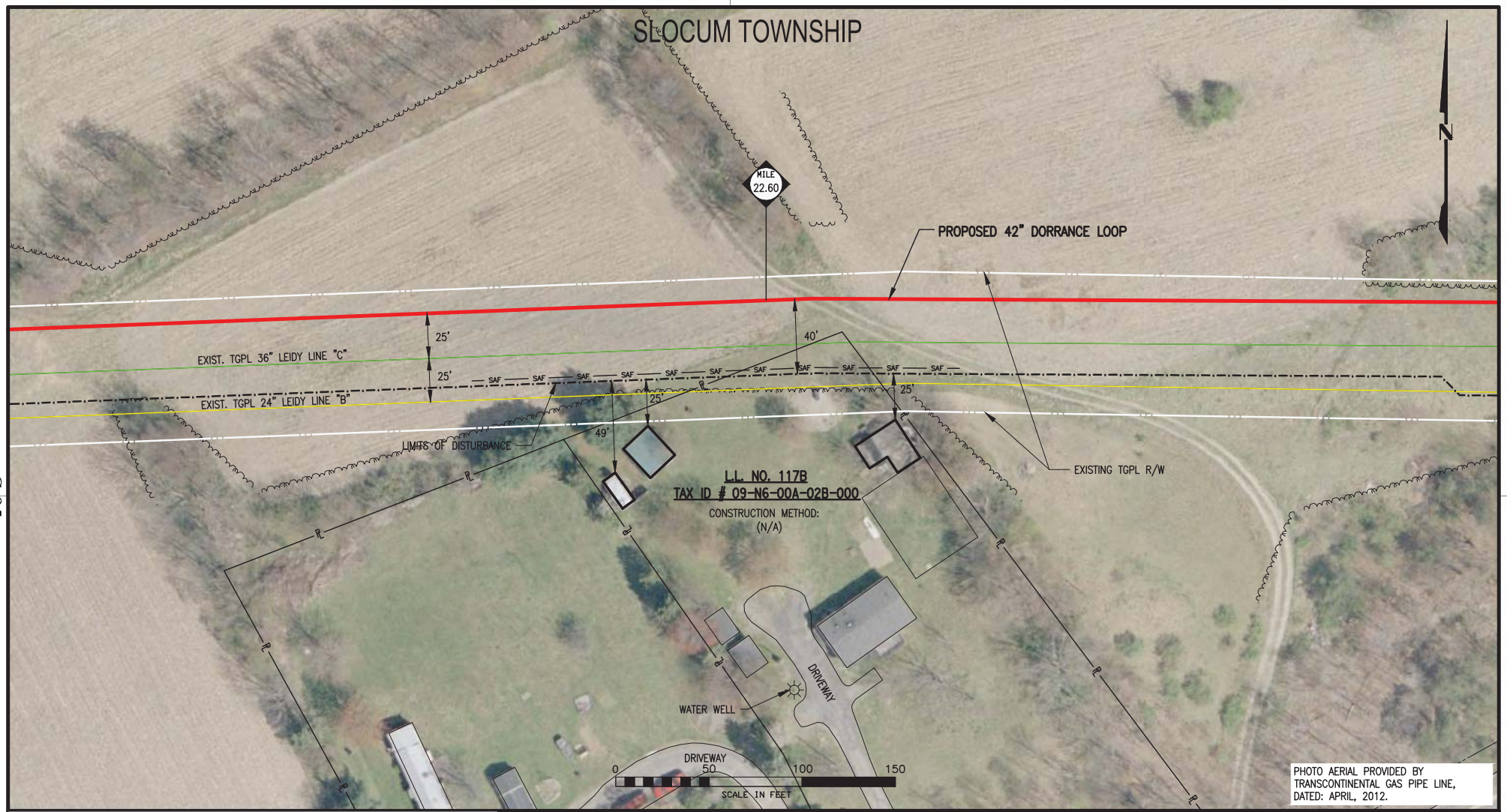

C-95

LEGEND

- PROPOSED 42" DORRANCE LOOP
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- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
- TREE LINE
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- W — WATER LINE
- UP — UTILITY POLE

THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

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2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 117B
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
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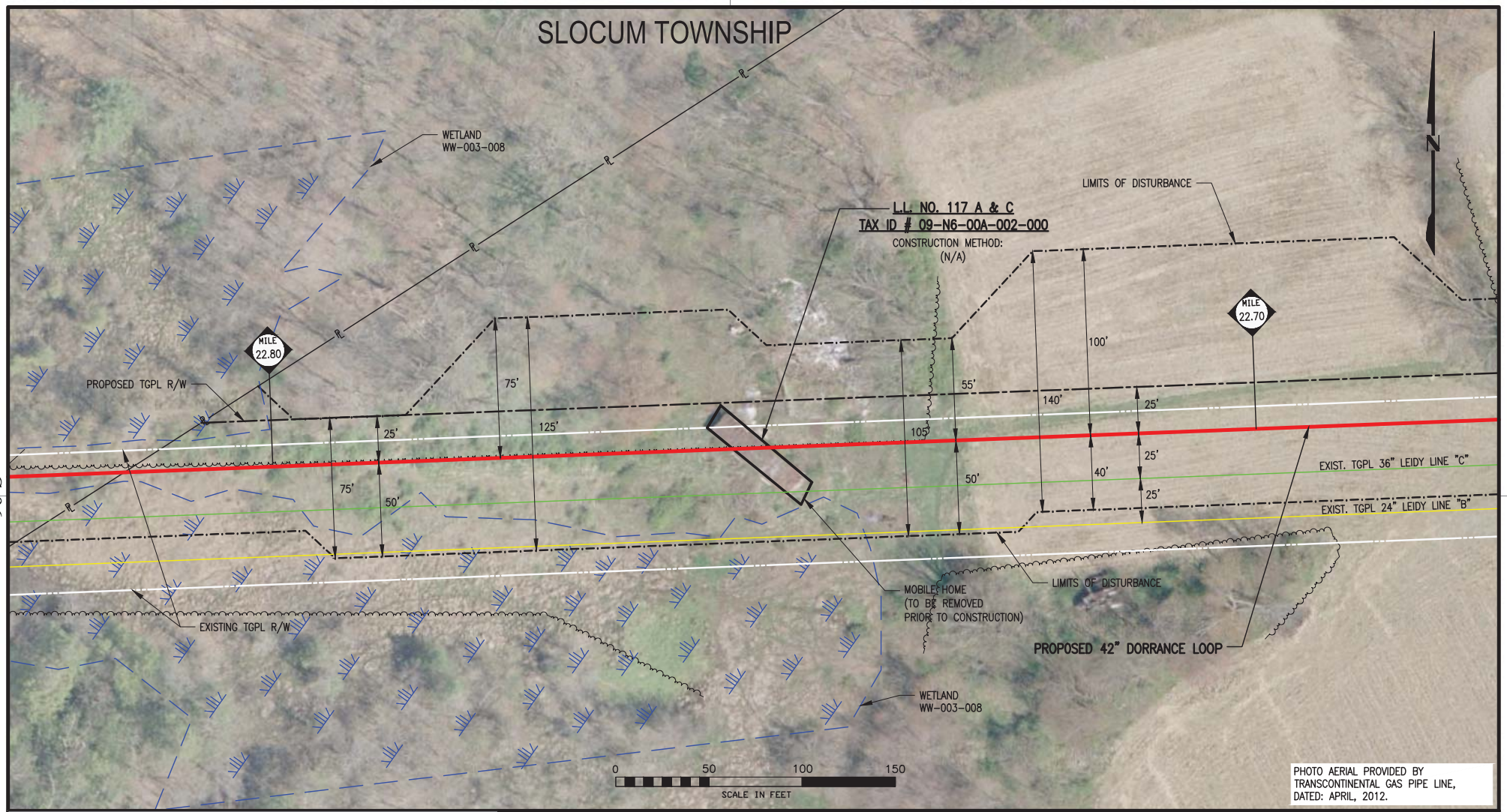

C-96

LEGEND

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- EXISTING TGPL 24" LEIDY LINE "B"
- EXISTING TGPL 36" LEIDY LINE "C"
- EXISTING TGPL R/W
- PROPOSED TGPL R/W
- PROPERTY LINE
- ROAD R/W
- LIMITS OF DISTURBANCE
- WETLAND
- SAF — CONSTRUCTION SAFETY FENCE
- RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
- SINGLE TREE
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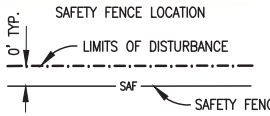

THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

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1	9/10/13	WGM	ISSUED FOR FINAL REVIEW	1129781	JM	MJH
2	9/18/13	WGM	ISSUED FOR FERC FILING	1129781	JM	MJH
3	1/17/14	WGM	ISSUED FOR SUPPLEMENTAL FILING	1129781	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
RESIDENTIAL CONSTRUCTION PLAN
PROPOSED 42" DORRANCE LOOP
FOR PROPERTY OF L.L. NO. 117 A & C
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGM	DATE: 8/03/13	ISSUED FOR BID:	SCALE: 1" = 50'
CHECKED BY: JD	DATE: 1/17/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 1/17/14		
W.O.: 1129781		DRAWING NUMBER: 25-1000-06/22.76-D	SHEET 1 OF 2

1/14/2014 8:53am wtland
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APPENDIX D

COMPREHENSIVE ROCK HANDLING PLAN FOR THE PRINCETON RIDGE SEGMENT OF THE SKILLMAN LOOP

Transcontinental Gas Pipe Line Company, LLC

COMPREHENSIVE ROCK HANDLING PLAN

LEIDY SOUTHEAST – SKILLMAN LOOP
PRINCETON RIDGE

Princeton, New Jersey

Prepared for:

Transcontinental Gas Pipe Line Company, LLC
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Prepared by:

335 Commerce Drive, Ste 300 Fort Washington, PA 19034
(215) 367-2500

May 2, 2014

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Transcontinental Gas Pipe Line Company, LLC (Transco) is planning to install approximately 6.18 miles of 42-inch gas transmission pipeline, known as the Skillman Loop, as part of the Leidy Southeast expansion project. Installation of the new pipeline will primarily be accomplished using conventional open-cut trench techniques. Pipeline trench depths are expected to extend approximately 8 feet below existing ground surface (bgs) to provide for a minimum 3 feet of cover in accordance with pipeline industry standards. Pipeline trench widths are expected to be approximately 6 feet.

The southern 1.3-mile portion of the proposed pipeline, termed the 'Princeton Ridge' area (see **Figure 1**), is known to contain boulders extending from existing ground surface to relatively shallow depths that will likely be encountered during the open-cut trench excavation for the pipeline. Transco proposes to utilize non-blasting techniques in excavating encountered boulders and shallow bedrock. This Comprehensive Rock Handling Plan (CRHP) provides guidance for the proper sizing (breaking), handling and removal of encountered boulders and shallow bedrock in support of the open-cut trench excavation in the Princeton Ridge area (Site).

Section 2.0 presents the approach used to develop this CRHP, while Section 3.0 summarizes the geologic setting of the Site. Section 4.0 provides the procedures and findings of the subsurface investigation completed at the Site. Section 5.0 provides industry methods for rock excavation, while Section 6.0 summarizes the evaluation of rock handling procedures. Section 7.0 summarizes the considerations for the existing pipeline associated with the above pipeline construction. Conclusions and recommendations established from the investigation findings and evaluation effort are presented in Section 8.0. Limitations of the completed investigation program are provided in Section 9.0.

To develop this CRHP, URS completed the following four (4) tasks:

- Review of Geologic Information,
- Subsurface Investigation,
- Evaluation of Rock Handling Procedures, and
- Considerations for Existing Pipeline.

URS reviewed published literature to understand the documented site-specific subsurface conditions that could be associated with the potential boulders and shallow bedrock. A summary of the geologic review is presented in Section 3.0.

URS completed a subsurface investigation at the Site to explore subsurface conditions and identify locations of potential boulders and shallow bedrock. Because conditions may exist in the subsurface environment that are not visible, the investigation approach utilized multiple industry-accepted techniques that could be implemented in complimentary fashion to better identify conditions that may be associated with the potential boulders and shallow bedrock. Procedures and results of the subsurface investigation are summarized in Section 4.0.

Based on the findings of the literature review and subsurface investigation, an evaluation of industry methods for rock excavation and site-specific rock handling procedures was completed and is presented in Sections 5.0 and 6.0, respectively.

The potential for the proposed pipeline construction to affect the integrity of the existing pipeline, which is approximately 20 feet offset from the proposed pipeline, was evaluated utilizing pipe stress analysis techniques. This analysis demonstrated that the anticipated stresses that would be generated during construction will be within acceptable limits. Procedures and results of the pipe stress analysis are presented in Section 7.0.

Published bedrock and surficial geologic information for the Site was reviewed and is summarized below.

3.1 BEDROCK GEOLOGY

The Site is situated within the Piedmont Physiographic province in New Jersey. It is underlain by rock formations belonging to the Juro-Triassic Newark Supergroup, specifically, the Lower Jurassic-Upper Triassic Passaic Formation and the Jurassic Diabase Formation. The Passaic formation underlying the Site consists of predominantly red beds of clayey siltstone, silty mudstone, clayey very fine-grained sandstone, and shale. In addition, beds of gray lake deposits can be found underlying the Site, which consist of gray to black silty mudstone, gray and greenish to purplish-gray clayey siltstone, black shale, and medium- to dark gray, clayey fine-grained sandstone.

The Site crosses a major sheet-like intrusion of dark greenish-gray to black, medium- to fine-grained diabase. The rocks of the Passaic Formation within approximately 1,000 ft stratigraphically above and approximately 650 feet stratigraphically beneath the diabase have thermally altered to hard, bluish gray or brittle black, very fine-grained hornfels. Both the Passaic and Diabase Formations are situated within the Newark Basin. **Figures 2A** through **2E** present bedrock geology at the Site.

3.2 SURFICIAL GEOLOGY

The topographic relief of the Site is characterized by low relief ridges, valleys, and gentle plains underlain by sedimentary rocks of the Newark Supergroup. Higher hills rising from the plains are underlain by diabase. The surfaces of these hills are littered with rounded and broken boulders which are the core stones in the residuum weathered from the diabase. Surficial deposits on this landscape include residuum (i.e., saprolite, grus, and rock rubble); colluvium accumulated on hillslopes; alluvium in stream channels, flood plains, and terraces; and windblown (eolian) sand and silt.

Overlying the diabase hill at the Site is sandy, silty diabase saprolite and rock rubble whose thickness can be as much as 20 feet. Granular, blocky rock rubble can be as thick as 10 feet. Also in this area is a poorly sorted (well-graded), chiefly compact and consistently firm diabase block colluvium with angular to subangular blocks of diabase whose thickness may range from 6 to 50 feet.

The Site is also underlain by weathered residuum of the Passaic Formation sedimentary rocks. The thickness ranges from less than 3 feet on ridges to as much as 10 feet where mixed with colluvium at the base of slopes. Residuum may or may not exhibit structure, and it typically grades downward to weathered bedrock. **Figures 3A** through **3E** present surficial geology at the Site.

URS completed a subsurface investigation at the Site to explore subsurface conditions and identify locations of potential boulders and shallow bedrock. Because conditions may exist in the subsurface environment that are not visible, the investigation approach utilized multiple industry-accepted techniques that could be implemented in complimentary fashion to more confidently identify conditions that may be associated with the boulders and shallow bedrock.

A continuous 'scan' of the subsurface environment using remote-sensing (geophysical) investigation techniques was completed along the proposed pipeline. Subsequently, a 'direct reading' of potential boulders and shallow bedrock inferred from the continuous geophysical scan was completed to confirm the presence/absence of the boulders and shallow bedrock to better measure these features and 'calibrate'/refine the geophysical survey findings.

4.1 PRELIMINARY TEST BORINGS

A total of ten (10) borings (borings B-1, B-2, B-3, B-4, B-A1, B-A2, B-A4, B-H1-1, B-H1-5 and B-H1-6) were completed as part of a preliminary subsurface exploration study. Approximate locations of the test borings are shown on **Figures 4A** through **4D**; a summary of test borings is presented in **Table 1**. Within each test boring, representative soil and rock samples were collected. The collected samples were transported to the URS geotechnical laboratory in Fort Washington, Pennsylvania for further examination and testing.

The test borings were completed by Uni-Tech Drilling Co., Inc. of Franklinville, New Jersey under subcontract to URS. The ten borings were completed between June 26 and August 23, 2013. The borings were completed using a track-mounted CME-55 ATV drill rig and hollow-stem auger (HSA) technique. Logs of the completed test borings are presented in **Appendix A**.

As shown on **Table 1**, none of the ten borings required rock coring before reaching 8 feet bgs (i.e., approximate bottom of the proposed pipeline trench), although potential boulders will likely exist shallower than 8 feet bgs at borings B-1 and B-A1 based on the sampling/drilling resistance encountered during the drilling (see test boring logs in **Appendix A**). In order to further develop a continuous subsurface profile, non-intrusive and continuous remote sensing techniques (i.e., geophysical survey) were implemented, which are described below.

4.2 GEOPHYSICAL SURVEY

Geophysical survey techniques were utilized as a 'baseline' for the subsurface investigation owing to their ability to provide continuous remote sensing ('scanning') along the proposed pipeline alignment. The geophysical survey techniques were selected to complement one another to effectively map potential boulders and shallow bedrock as well as to indirectly (i.e., non-destructively) measure the strength of potential boulders and shallow bedrock (i.e., P-wave velocity). The following three techniques were utilized for the geophysical survey:

- 2-Dimensional Electrical Resistivity Imaging (ERI),
- Seismic Refraction, and
- Ground Penetrating Radar.

The ERI survey was utilized to identify potential boulders and depth to bedrock. The seismic refraction survey was utilized to assess rippability of potential boulders and bedrock as well as to profile the top of bedrock to complement the ERI survey. The GPR survey was utilized to assess

dimensions of apparent boulders, if possible, and to complement the ERI survey. Global Positioning System (GPS) mapping was used to map exposed boulders. Each of these techniques is further described below.

Prior to the geophysical survey, Transco surveyed the Site and marked (staked) every 100-foot interval along the proposed pipeline alignment. The geophysical survey was referenced to the staked locations. Quantum Geophysics, Inc. (Quantum) of Phoenixville, Pennsylvania completed all geophysical surveys along the proposed pipeline alignment under subcontract to URS between October 1 and October 29, 2013. Details of the geophysical survey techniques, survey area selection, implementation, and findings are presented in **Appendix B**.

4.2.1 2-Dimensional Electrical Resistivity Imaging (ERI)

2-Dimensional Electrical Resistivity Imaging (ERI) was utilized to identify potential boulders and depth to bedrock. The ERI survey explores the subsurface response as an electric current, and is applied into the soil via two metal stakes (current electrodes). The passage of the current through the ground yields a voltage distribution which can be directly measured by two additional potential electrodes. The ground resistance is calculated as a function of the voltage. The amount of resistance is an indicator of material type, presence as well as saturation level of fluids, and the presence of buried objects.

The ERI survey is applicable to profiling top of rock, which is observed as a laterally continuous horizon characterized by a high-gradient (electrical resistivity increases significantly over a short depth interval). High electrical resistivity anomalies observed within the soil indicate potential boulders.

The data sets were inverted using the AGI program EarthImager2D. EarthImager2D divides the subsurface into a number of rectangular blocks and determines the individual resistivities of the rectangular blocks that will produce an apparent resistivity pseudo-section that agrees with the actual measurements. Several iterations of modeling are conducted to reduce the difference between the calculated and measured apparent resistivity values by adjusting the resistivity of the model blocks. The processed data were compiled into 450-foot profile sections, annotated in computer-aided design and drafting (CADD), and then plotted on 11 inches by 17 inches border sheets at a scale of 1 inch equals 30 feet.

Interpreted (potential) boulders and top-of-bedrock are presented in **Figures 2** through **16 in Appendix B**. Interpreted boulders potentially located above the proposed bottom of trench (i.e., 8-foot depth) were encountered at a total of 95 locations (summarized in **Table 3** of **Appendix B**). Interpreted top-of-bedrock potentially located above the proposed bottom of trench (i.e., 8-foot depth) were encountered at a total of 36 locations (summarized in **Table 4** of **Appendix B**).

4.2.2 Seismic Refraction

Seismic refraction was utilized to assess rippability of potential boulders and bedrock as well as to profile the top of bedrock to complement the ERI survey. The seismic refraction technique consists of emitting a seismic wave through the subsurface from a source at the surface level. Waves are refracted as they travel through the interface of different materials. The energy from the refracted waves returns to the surface and are sensed by geophones. Through the comparison of velocity of waves travelling along the surface and the velocity of refracted waves, a soil

layering profile can be created. Information collected from test borings can further calibrate the data acquired along the seismic refraction survey line.

In order to evaluate the rippability of boulders, the refraction survey was conducted on large boulders exposed at the ground surface. Two geophones were placed on the rock surface and a light tap was applied on the rock creating an energy wave that travels across the body mass. From the data obtained through the geophones, the wave (P-wave) velocity was calculated. Furthermore, using preliminary findings from the ERI survey described in Section 4.2.1, ten areas of potentially shallow bedrock (i.e., shallower than 8 feet bgs) with no apparent boulders in soils were selected for seismic refraction surveys to assess rippability of bedrock.

The P-wave (compressional wave) velocity information generated from the refraction survey for boulders and bedrock is summarized in **Tables 1** and **2** in **Appendix B**, respectively. As shown in **Table 1** in **Appendix B**, P-wave velocities measured at the four exposed boulders range from 12,700 to 18,500 feet per second (ft/sec) with an average value of 15,500 ft/sec. P-wave velocities measured for the bedrock range from 5,090 to 29,630 ft/sec as summarized in **Table 2** in **Appendix B**. According to Caterpillar's Handbook of Ripping (Reference 1), all boulders and most of bedrock (except weathered rock zone near bedrock surface) is anticipated to be non-rippable.

4.2.3 Ground Penetrating Radar (GPR)

GPR was utilized to assess dimensions of apparent boulders, if possible, and to complement the ERI survey. This method is based on dielectric properties, or the ability to sustain a static electric field, of materials. In-ground penetrating radar surveys electromagnetic waves that are transmitted into the ground. As these radio waves encounter contrasts in dielectric properties, some of the energy is reflected to the ground surface and captured by the surface receiver. The strength of reflected energy is dependent on the contrast of electrical properties; the variation in strength with time can be translated into 2-dimensional subsurface profiles.

A single pass along the proposed pipeline alignment with a 200 MegaHertz (MHz) Antenna was completed. The GPR data, for the most part, was not helpful and Quantum did not observe the type of response (specifically high-amplitude reflections) expected where boulders are known to exist. Quantum suspects that this is because of clayey soils near the surface, as reported in the boring logs (**Appendix A**). The only exception is between stations 8+50 and 9+50 where two high-amplitude, parabolic-shaped anomalies (one centered at station 9+20 and the other centered at station 9+27 suggestive of boulders) were observed approximately 1 to 2 feet bgs. Two to 3-foot diameter boulders were noted along the western edge of the right-of-way where these two anomalies are observed (see **Figure 17** in **Appendix B**). Also present between stations 8+50 and 9+50 are zones of discontinuous high-amplitude reflections suggestive of potential rock rubble fill perhaps from the previous excavation of the existing pipeline. GPR responses suggestive of small diameter boulders and rock fill are consistent with high electrical resistivity measurements indicating potential boulders in the ERI profiles (see **Figures 3** and **4** in **Appendix B**).

4.2.4 Global Positioning System (GPS) Mapping

A Leica Model G-14 GPS receiver operating on the Leica Smartnet satellite network was used to map exposed boulders and boulder fields. The G-14 employs real-time kinematic (RTK) data-

processing to guarantee correct results, accurate to 0.001 foot (horizontal and vertical). The GPS mapping results are shown in **Figures 1A** through **1E** in **Appendix B**.

4.3 CONFIRMATORY DRILL

To further assess the shallow-seated boulder and bedrock identified by the geophysical survey and calibrate/refine the geophysical survey findings, intrusive, 'direct-reading' geotechnical drilling utilizing an Ingersoll-Rand ECM 590 self-contained hydraulic crawler drill rig (so called 'air-track' rig) was implemented. The confirmatory drilling (CD) allows for 'quantitatively' measuring relative soil/boulder/bedrock stiffness/hardness via resistance of drilling tools during their penetration. Therefore, the CD effectively explores the presence, depth and thickness (for boulders only where feasible) of apparent shallow-seated boulders and bedrock.

CD locations were determined based on the findings of the geophysical survey that had been completed along the proposed pipeline alignment, specifically potential boulders and bedrock shallower than the planned bottom of pipeline trench, i.e., 8 feet bgs.

The CD was completed by Uni-Tech Drilling Co., Inc. of Franklinville, New Jersey under subcontract to URS. A total of 86 CD locations were completed between November 11 and 18, 2013. Locations and findings of the CD exploration are presented in **Table 2**. Logs of the completed CD exploration are presented in **Appendix C**.

As shown in **Table 2**, termination depths of the CD ranged from approximately 1 foot to 18 feet, with an average depth of approximately 10 feet. Where a boulder was encountered before reaching the termination depth of CD, top-of-boulder was encountered as shallow as at the existing ground surface and as deep as approximately 13 feet depth, with an average depth of approximately 4 feet. Thickness of boulder was encountered up to 5 feet. Where bedrock was encountered before reaching the termination depth of CD, top of bedrock was encountered as shallow as near the existing ground surface and as deep as approximately 13 feet depth, with an average depth of approximately 7 feet.

Interpreted (potential) boulders and top-of-bedrock information based on the ERI survey (see Section 4.2.1) were subsequently revised utilizing the above confirmatory investigation results, where warranted and presented in **Figures 2** through **16** in **Appendix B**.

4.4 GEOTECHNICAL LABORATORY TESTING

Geotechnical laboratory testing was completed on representative samples of the encountered soil materials collected from the preliminary test borings (described in Section 4.1). Results of the testing program are presented in **Appendix D** of this report.

Selected split-spoon soil samples were tested for physical properties including natural moisture content (ASTM D2216), grain-size distribution (ASTM D421/422) and plasticity by Atterberg limits (ASTM D-4318), to assist in classifying the encountered soils and evaluating stratigraphical continuity. Rock core samples collected from borings B-H1-1, B-H1-5 and B-H1-6 were tested for unconfined compressive strength (ASTM D 7012).

Soil testing results are summarized on pages D-1, D-2, D-10 and D-11. Grain-size distribution curves are presented on pages D-3 through D-9 and pages D-12 through D-14. Unconfined compressive strength test results on rock core specimens are summarized on pages D-10 and D-11.

4.5 SUMMARY OF SUBSURFACE INVESTIGATION FINDINGS

Based on review of the completed preliminary test boring results (Section 4.1), geophysical survey results (Section 4.2), confirmatory drill results (Section 4.3), and geotechnical laboratory testing results (Section 4.4), the proposed pipeline alignment can be divided into excavation zones as summarized in **Table 3**.

As shown in **Table 3**, in order to provide guidance to the Transco Contractor relative to the anticipated subsurface materials that will be encountered during the open-trench construction and associated schedule, the Site has been divided into four (4) excavation zones based on the anticipated subsurface materials during open-trench excavation to install the planned pipelines, which are:

- Zone A – Soil Only,
- Zone B – Soil and Shallow Bedrock,
- Zone C – Soil and Boulder, and
- Zone D – Soil, Shallow Bedrock and Boulder.

In summary, as presented in **Table 3**, the Site is comprised of the following excavation zones based on the subsurface investigation findings:

- Approximately 1,400 feet of pipeline construction (approximately 20%) would encounter soil only (Zone A);
- Approximately 1,300 feet of pipeline construction (19%) would encounter shallow bedrock (Zone B);
- Approximately 3,100 feet of pipeline construction (46%) would encounter boulder (Zone C); and
- Approximately 1,100 feet of pipeline construction (15%) would encounter both shallow bedrock and boulder (Zone D).

5.1 OVERVIEW

Several industry-proven methods are commonly utilized to excavate/remove rock and boulders for open-trench construction. All of the methods function by converting or 'sizing' the intact rock or boulder into smaller, more manageable pieces that can be safely handled and transported. The suitability/efficacy of each method depends on several factors including the compressive strength, hardness and 'massiveness' (presence of weaker secondary features) of the rock or boulder, available workspace, site constraints, adjacent/surrounding land use, schedule and cost-efficiency. Within the construction industry, these methods are typically grouped into the following categories:

- Ripping – utilizes specialized tools that tear or shear the rock mass;
- Hydraulic Breaking – utilizes specialized tools that apply compressive or tensile loads in excess of the rock's inherent strength to effectively break the rock mass into smaller pieces;
- Splitting Using Expansive Grouts – utilizes expansive grout materials to split the rock mass; and
- Blasting – Not Proposed at the Site.

Additional discussion of each of these rock removal methods is provided below including considerations for assessing the applicability and efficacy of each method.

5.2 RIPPING

Ripping consists of using tractors or similar equipment with an attached mechanical tooth ('ripper') or teeth that are lowered and dragged through the mass to be ripped. Once ripping is completed, loosened material is removed by excavators.

'Rippability' is an industry-standard term applied to the suitability of a rock mass to be broken into smaller pieces by ripping methods. Seismic velocity is a property relating to the propagation of compression or similar waves through dense media and, as such, is an industry-proven method used to measure the relative density of rock. Caterpillar Inc. of Peoria, Illinois has published 'rippability charts' in its 'Handbook of Ripping' to assist in the selection and use of their equipment to rip rock. Example rippability charts with related tractor types and seismic velocities are provided in **Figure 5**.

Seismic (P-Wave) velocities measured for exposed boulders and bedrock at the Site are summarized in **Tables 1** and **2** of **Appendix B**. As shown in **Tables 1** and **2** of **Appendix B**, P-Wave velocities for the exposed boulders range from 12,700 to 18,500 ft/sec, with an average velocity of 15,500 ft/sec. P-Wave velocities for bedrock range from 5,090 ft/sec to 29,630 ft/sec. Due to high P-wave velocities of boulder and bedrock, the use of ripping to accomplish the open-trench excavation is anticipated to be limited.

5.3 HYDRAULIC BREAKING

Rock breaking is most commonly performed using hydraulically-driven breakers/hammers fitted on excavators that, for trenching, typically will sit on the side of the trench. Breaking is essentially achieved through rapid-cycle impact loading imposed by the breaker or hammer that acts to crush or shear the rock material into smaller particles.

The carrier size, weight and lift capacity depend on the selected breaker/hammer size. The size of the trench opening is, in turn, often dictated by the size of the breaker/hammer since the trench side slopes need to accommodate its width. The placement of the equipment must also consider loading of the excavated material so that the excavator or other equipment (carrier) to which the breaker/hammer is attached has adequate swing stability to remove material from the work area.

5.4 SPLITTING USING EXPANSIVE GROUTS

This method consists of fracturing (splitting) rock through the use of a one-component mortar placed (loaded) in a row of holes drilled into the rock mass. As the mortar expands inside the holes, high tensile stresses develop within the rock body between the holes causing it to crack preferentially along the row of holes. This method is therefore best-suited for projects where blasting is not feasible. Products such as Da-mite® Rock Splitting Mortar are available at different grades. Rock temperature and loading hole diameter define which mortar grade should be used.

The loading hole pattern is established based on the rock formation and access. After the mortar is placed into the holes, fracturing typically occurs within a few hours, although very hard rock may require up to 72 hours to crack. After the fracturing process is completed, excavation with impact tools can be used to facilitate the separation of material for loading and hauling. Multiple, successive rows of mortar splitting may be necessary to size larger rock volumes, and thus may be very time-consuming but still possibly desirable.

6.1 OVERVIEW

To explore subsurface conditions and identify locations of potential boulder and shallow bedrock along the Site, URS completed an investigation comprised of multiple industry-accepted techniques that were implemented in complimentary fashion to more confidently identify conditions that may be encountered during the pipeline construction and are discussed in Section 4. Several industry-proven methods that are commonly utilized to excavate/remove rock and boulders for the open-trench construction are also discussed in Section 5.

Based on the discussions in Sections 4 and 5, proposed pipeline construction procedures will consist of the following four (4) activities, which are:

- Preparation,
- Trenching,
- Pipeline Installation and
- Restoration.

Details of the above four (4) activities as well as the details of boulder and bedrock excavations are described below.

6.2 PREPARATION

Preparation will include removing surface features that could hinder or obstruct the pipeline construction. Two crews will methodically traverse the right-of-way (ROW) locating the center line of the existing pipeline and recording the precise location. Boulders observed above the existing and proposed pipeline will be carefully removed. Low hanging limbs and trees that could obstruct or interfere with the work will also be removed.

A large backhoe will then install a wooden mat bridge on the ROW where a travel lane, parking area or lay down area are required for installing the proposed pipeline. This travel lane will be approximately 20 feet wide and will cover the existing pipeline in most areas.

A 50-foot wide work corridor will be maintained except for a few larger areas where cross-overs or work side changes will be necessary.

6.3 TRENCHING

Once the wooden mat bridge is installed, the trench for the proposed pipeline will be excavated to remove boulders and shallow bedrock. This ‘pre-excavation’ will prepare approximately 6-foot wide and 8-foot deep open-cut trench as well as approximately 12-foot wide and 8-foot deep bell hole ditch (where welds are made) for pipeline installation.
The pre-excavation will be completed using two crews. Each crew will be equipped with two excavators that will complete the following:

- The first excavator will excavate the trench and place excavated materials in a ‘bedding box’ staged on the mat road.

- The second excavator will remove the material from the bedding box, sort material and re-place the suitable soils as backfill back into the trench. Unsuitable material (e.g., boulders, excavated rock) will be removed from the work area.

A rock drill will accompany each crew. In areas where solid rock is encountered, the rock drill will pattern drill the rock. Expansive grout will be placed in the drilled holes to fracture the rock. A hydraulic hammer will break the rock to manageable sizes. The trench will be re-excavated at the time of pipeline installation.

6.3.1 Excavating Boulders

Based on the P-wave velocities measured for the four exposed boulders (see Section 4.2.2), all boulders are anticipated to be non-rippable. Boulders, if encountered during the 'pre-excavation' trenching, will be excavated, re-sized, and transported off-site as described below:

- **Case A – If volume of boulder is less than 4 cubic yard (CY)** – Boulder will be removed from trench by an excavator. Removed boulders will be loaded into a dump truck or onto a flat-bed trailer and transported off-site.
- **Case B – If boulder is greater than 4 CY in volume and breakable by a hydraulic hammer** – A hydraulic hammer will break the boulder in-situ and an excavator will remove re-sized boulder particles from the trench. Removed boulders will be loaded into a dump truck or onto a flat-bed trailer and transported off-site.
- **Case C – If boulder is greater than 4 CY in volume and not breakable by a hydraulic hammer** – 'Pre-drilling' (i.e., creating perforations through the boulder) will be completed to create a weak joint/interface to facilitate breaking and re-sizing the boulder in-situ by a hydraulic hammer. An excavator will remove re-sized boulder particles from the trench and removed boulders will be loaded into a dump truck or onto a flat-bed trailer and transported off-site.
- **Case D – If boulder is greater than 4 CY in volume and not breakable by a combined use of pre-drilling and a hydraulic hammer** – Expansive grouting techniques will be utilized to split (fracture) the boulder in-situ. After the splitting process is completed, excavation with a hydraulic hammer can be used to facilitate the separation of material for loading and hauling. An excavator will remove re-sized boulders from the trench and removed boulders will be loaded into a dump truck or onto a flat-bed trailer and transported off-site.

6.3.2 Excavating Bedrock

Based on the P-wave velocities measured for the bedrock (see Section 4.2.2), most bedrock encountered is anticipated to be non-rippable. Shallow bedrock, if encountered during the 'pre-excavation' trenching, will be excavated, re-sized, and transported off-site as described below:

- **Case A – If bedrock is breakable by a hydraulic hammer** – A hydraulic hammer will break the bedrock and an excavator will remove broken rock from the trench. Removed rock will be loaded into a dump truck or onto a flat-bed trailer and transported off-site.

- **Case B – If bedrock is not breakable by a hydraulic hammer** – 'Pre-drilling' (i.e., creating perforations through the bedrock) will be completed to create a weak joint/interface to facilitate breaking and re-sizing the rock by a hydraulic hammer. An excavator will remove broken rock from the trench and removed rock will be loaded into a dump truck or onto a flat-bed trailer and transported off-site.
- **Case C – If bedrock is not breakable by a combined use of pre-drilling and a hydraulic hammer** – Expansive grouting techniques will be utilized to split (fracture) the bedrock. After the splitting process is completed, excavation with a hydraulic hammer can be used to facilitate the separation of material for loading and hauling. An excavator will remove broken rock from the trench and removed rock will be loaded into a dump truck or onto a flat-bed trailer and transported off-site.

6.4 PIPELINE INSTALLATION

At the time of pipeline installation, the 'pre-excavated' and backfilled trench will be re-excavated. The material excavated will be suitable for re-use as trench backfill. Pipe joints will be welded in place and coated. The pipe will then be padded (surrounded) with selected or imported soil. The trench will then be backfilled and the ground surface will be graded to the existing ground surface.

6.5 RESTORATION

After the pipe installation is completed, a restoration crew will restore the right-of-way in accordance with the restoration plan.

7.1 OVERVIEW OF EXISTING PIPELINE

Transco's existing 36-inch steel pipeline runs parallel to the proposed pipeline and the proposed pipeline will cross over the existing pipeline near Mile Post (M.P.) 1777.6. The existing 36-inch pipe has a wall thickness of 0.500 inches and is X-52 Yield.

To evaluate the effects of the proposed pipeline construction on the integrity of the existing pipeline, pipe stress analysis (PSA) was completed based on proposed construction techniques and conservatively-modeled subsurface conditions. Details of the PSA are discussed below.

7.2 SUBSURFACE INVESTIGATION ALONG EXISTING PIPELINE

To assess the potential for subsurface conditions to adversely affect the existing pipeline during the proposed pipeline construction, subsurface conditions along the existing pipe, specifically the potential presence of a boulder or shallow rock adjacent to or contacting the existing pipe, were investigated using non-intrusive geophysical techniques.

A trial geophysical survey was completed along the existing pipeline (with approximate offset of 3 feet from the edge of the existing pipe). The trial geophysical survey was conducted on November 4, 2013 using a seismic method termed multi-channel analysis of surface waves (MASW) and GPR with a 400 MHz antenna. The electrical resistivity imaging (ERI) techniques survey successfully used along the proposed pipe was excluded because the existing metal pipe attracts electrical current and therefore affects electrical resistivity measurements.

Based on review of the trial survey results, the MASW appeared to indicate more meaningful results than the GPR. A MASW survey was subsequently completed along the entire existing pipeline at the Site and is further discussed below.

7.2.1 MASW Survey of Existing Pipeline

Quantum completed the MASW survey along the existing pipeline alignment (with approximately 3 +/- feet offset west of the centerline) under subcontract to URS between November 11 and November 15, 2013. Details of the MASW survey techniques, implementation, and findings are presented in **Appendix B**.

As described in **Appendix B**, site conditions impacted the quality of the data such that shear wave velocity (V_s) profiles could be obtained only along the following five (5) sections:

Existing Pipeline Stations	Equivalent Proposed Pipeline Stationing
597+02 to 601+85	0+00 to 4+83 (483 feet)
605+40 to 607+60	8+40 to 10+60 (220 feet)
613+00 to 614+00	16+00 to 17+00 (100 feet)
616+30 to 617+00	19+30 to 20+00 (70 feet)
648+62 to 652+17	51+81 to 55+36 (355 feet) – Total 1,228 feet

Shear wave velocity (V_s) profiles could be obtained for only eighteen (18) percent of the existing pipeline length (1,228 feet over the total length of the existing pipeline, 6,820 feet) and each Vs

profile is provided in **Figures 28** through **32** of **Appendix B**. Accordingly, reasonably conservative subsurface conditions were utilized during the PSA, which is described below.

7.3 PIPE STRESS ANALYSIS

Stress Engineering Services, Inc. (SES) calculated stresses in the existing adjacent pipeline considering overburden stresses associated with construction of the new pipeline using finite element analysis (FEA). The existing line is a 36-inch × 0.500-inch WT, Grade X52 steel pipe having a Maximum Allowable Operating Pressure (MAOP) of 800 psi. The FEA work examined a range of variables that included variations in burial depth, soil type, position of the wooden bridge over the existing pipeline, internal pressure, distance between the existing pipeline and new pipeline ditch, and the potential impact of rock interacting with pipeline.

A combination of two-dimensional (2D) and three-dimensional (3D) FEA models were used to evaluate the stresses in the buried pipe. The results of the 2D model indicate that soil stiffness, lateral position of the wooden bridge, and the presence of an infinitely stiff rock with a localized contact area would have the largest impact on the development of stresses in the existing pipeline. Using results of the 2D model, additional analyses were conducted using a 3D model that permitted an assessment of load variations along the length of the pipeline.

Based on the information provided to SES and the load cases considered, the modeling results generated by this study indicate that the proposed installation activities are unlikely to generate unacceptable conditions on the existing pipeline per ASME B31.8. A complete pipe stress analysis report (Princeton Ridge Overburden Assessment) is presented in **Appendix E**.

8.1 CONCLUSIONS

An investigation was completed at the Site to explore subsurface conditions that may include shallow-seated boulders and bedrock. The investigation approach utilized several proven and industry-accepted methods, which fell into one of three general categories including 'geologic setting', 'remote sensing' and 'direct reading and measurement'.

Methods were selected based on feasibility to implement, proven reliability, and the degree to which the method findings or 'data sets' as a whole could effectively compliment (i.e., build upon) one another and maximize the level of confidence regarding accuracy of the findings.

Based on evaluation of the collected data sets, the Site has been divided into the following four (4) different zones based on the subsurface materials that are expected to be encountered during the 'pre-excavation' trenching for the pipeline:

- Zone A – Soil Only – approximately 1,400 feet length (20%) of open trench,
- Zone B – Soil and Shallow Bedrock – approximately 1,300 feet length (19%) of open trench,
- Zone C – Soil and Boulder – approximately 3,100 feet length (46%) of open trench, and
- Zone D – Soil, Shallow Bedrock and Boulder – approximately 1,100 feet length (15%) of open trench.

Recommendations for excavating within the four different zones are provided in the following section.

8.2 RECOMMENDATIONS

Consistent with the findings of our completed subsurface investigation and the planned method of construction (described in Section 6), we recommend the following be incorporated into the project design and implementation:

- Boulders observed above the existing pipeline should be carefully removed.
- Prior to placing the timber mat bridge above the existing pipeline (to provide a construction access/platform), pipe cover should be measured to verify a minimum pipe cover (3 feet) is in place above the existing pipeline. Where the pipe cover is measured less than 3 feet, especially where boulders may have been removed, selected soil fill should be added to maintain the minimum 3 feet cover.
- To maintain the greatest degree of safety, the Transco Contractor should utilize the bridge or 'air gap' method (see Section 7) during the pipeline construction.
- The Transco Contractor should plan and sequence the pre-excavation trenching work (see Section 6.3) by prioritizing the excavation zones in the following order such as (1) Zone D, (2) Zone B and Zone C, and (3) Zone A in consideration of potentially extensive time that may be required to conduct pre-drilling and expansive grouting with subsequent hydraulic breaking.

- Staging areas for bedding boxes and construction access roads for off-site disposal of unsuitable material (e.g., re-sized boulder and bedrock) should be planned and coordinated by the Transco Contractor in accordance with the pre-scheduled excavation zones described above.
- Considering the volume of boulders and shallow bedrock expected to be encountered during the 'pre-excavation' (see Section 6.3), a significant volume of selected or imported soils will likely need to be transported to the Site to backfill the open-trench after the 'pre-excavation'. The Transco Contractor should plan and coordinate staging areas for the selected or imported soils as well as associated construction access roads.
- The potential for significant boulders or shallow bedrock zones to be encountered during the 'pre-excavation' not already addressed in the subsurface investigation findings (Section 4) is believed to be low. However, the Transco Contractor should develop a contingency excavation plan that presents measures for removing boulders or rock should an unexpected localized boulder/shallow bedrock zone be encountered at the Site.

In summary, URS believes the proposed pipeline can be safely installed in a manner that does not affect the integrity of the existing pipeline provided the above recommendations are implemented in conjunction with standard industry practices during the pipeline installation.

The subsurface investigation work completed by URS for this project was performed in accordance with reasonable and accepted engineering practices. No warranty or guarantee, either written or implied, is applicable to this work. The findings, conclusions and recommendations presented in this report are based on the assumption that the subsurface conditions do not deviate appreciably from those disclosed by the geophysical survey, test borings, confirmatory drill and the other exploration methods and are subject to confirmation or revision upon review by URS of the final plans and specifications covering pertinent details of the proposed construction. The conclusions and recommendations are also based on the premise of competent field engineering, monitoring and testing during construction.

This report has been prepared solely for use by Transcontinental Gas Pipe Line Company, LLC for the design of this particular project. Any reuse of this report, particular by third parties, without the express permission of URS is solely at their own risk.

TABLE 1
Summary of Test Borings
Transco LSE Skillman Loop - Princeton Ridge
Rock Handling Plan
Princeton, New Jersey

Boring No.	Termination Depth (ft)	Soil Drilling (ft)	Rock Coring (ft)	Ground Surface Elevation (ft)	Approximate Top-of-Bedrock Elevation (ft)
B-1	15.0	15.0	-	253.0	NE
B-2	15.0	15.0	-	331.5	NE
B-3	14.3	14.3	-	308.2	NE
B-4	13.2	13.2	-	232.1	NE
B-A1	15.0	15.0	-	339.6	NE
B-A2	13.7	13.7	-	190.0	NE
B-A4	13.4	13.4	-	265.2	NE
B-H1-1	75.0	10.0	65.0	240.2	230.2
B-H1-5	125.0	17.5	107.5	191.5	174.0
B-H1-6	75.0	8.0	67.0	182.5	174.5
TOTAL	**374.6**	**135.1**	**239.5**		

Notes:
NE = Not Encountered.

Table 2 - Summary of Confirmatory Drill (Page 1 of 5)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

Confirmatory Drill No.	Station	Boulder			Bedrock	EOCD	Notes
		TOB (ft, bgs)	BOB (ft, bgs)	Thickness (ft)	TOR (ft,bgs)	(ft,bgs)	
92	1+70				3.5	10.0	Soil with shale fragments from GS to 3.0' bgs.
91	2+25				3.0	11.0	Weathered rock from 1' to 3' bgs. Hornfells from 10' bgs.
90	3+12	2.5	5.0	2.5	11.9	14.0	Groundwater at approximately 9' bgs.
		7.0	9.0	2.0			
89	Not Drilled - See Notes to the right						NOT DRILLED DUE TO WET AND SOFT GROUND SURFACE CONDITIONS WHICH COULD CAUSE POTENTIAL RUTTING ON PRIVATE PROPERTIES
88	Not Drilled - See Notes to the right						
87	Not Drilled - See Notes to the right						
86	Not Drilled - See Notes to the right						
85	Not Drilled - See Notes to the right						
84	Not Drilled - See Notes to the right						
83	Not Drilled - See Notes to the right						
82	Not Drilled - See Notes to the right						
81	12+55	0.5	NM	NM		0.8	Boulder could not be penetrated due to its hardness. CD terminated at 0.8' bgs.
80	14+05	2.0	2.3	0.3		9.0	Wet cuttings encountered at approximately 8' bgs.
79	15+75					11.0	Hard wood encountered from 1.8' to to 4.4' bgs then soft wood from 4.4' to 8.0'.
78	16+67	2.8	3.5	0.7		9.0	Soil with rock fragments at 2.0', 4.0' and 7.0' bgs.
77	16+90	6.8	8.0	1.2		9.0	Soil with rock fragments at 6.7' bgs.
76	17+51	7.0	7.4	0.4		9.0	Hard drilling at 2.5' bgs.
75	17+93	2.0	3.2	1.2		9.0	Boulder material became softer at 4.5' bgs. Rock fragments encountered at 5' and 6.8' bgs.
		3.8	5.0	1.2			
74	18+44					8.5	Rock fragments encountered at 1.5' and between 3.8' and 5.0' bgs.
73	19+67	0.1	1.9	1.8		9.0	Soil with rock fragments between 2.5' and 3.0' bgs.
		2.0	2.5	0.5			
72	19+98	0.8	3.5	2.7		9.0	Boulder material became softer at 2.9' and 5.8' bgs.
		4.0	7.0	3.0			
71	20+42	0.2	NM	NM		1.8	Boulder could not be penetrated due to its hardness. CD terminated at 1.8' bgs.
70	20+85	7.5	7.8	0.3		10.0	Soil with rock fragments encountered at GS and 4.0' bgs.
69	21+30	7.0	9.0	2.0		13.5	Soil with rock fragments encountered at 1.5', 3.5', 6.5' and 12.7' bgs.
		13.0	13.5	0.5			

Table 2 - Summary of Confirmatory Drill (Page 2 of 5)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

Confirmatory Drill No.	Station	Boulder			Bedrock	EOCD	Notes
		TOB (ft, bgs)	BOB (ft, bgs)	Thickness (ft)	TOR (ft,bgs)	(ft,bgs)	
68	21+74	0.0	5.0	5.0		13.0	Boulder material became softer at 4.8' and 8.5' bgs.
		7.0	10.0	3.0			
67	22+21	0.3	2.3	2.0	5.0	10.0	
66	23+13	5.9	8.0	2.1	9.0	11.0	Soil with rock fragments encountered from 1.5' to 2.5' and from 3.5' to 4.0' bgs.
65	23+61	4.0	5.9	1.9		9.0	Hard rock fragments encountered at 0.8' bgs.
65A	23+83				1.3	11.0	Soil with rock fragments encountered at 1.2' bgs. Softer rock encountered between 9.5' and 9.8' bgs.
64	24+13	2.0	2.3	0.3	6.1	8.8	Soil seams encountered between boulders at 2.3' and at 3.9' bgs. Bedrock became slightly softer between 7.5' and 8.0' bgs.
		2.5	3.9	1.4			
		4.0	4.8	0.8			
63	24+68				7.0	8.5	Weathered rock encountered at 6.7' bgs.
62	25+58					9.0	Harder drilling observed at 2.0' bgs.
61	25+91	1.0	1.8	0.8		10.0	
		3.1	5.7	2.6			
60	26+90	0.0	2.0	2.0		8.5	
59	27+05					8.5	Harder drilling observed at 1.1' and at 5.9' bgs.
58	27+83	4.8	7.8	3.0		12.0	Soil with rock fragments encountered at 2.5' and 9.0' bgs. Harder drilling observed at 11.0' bgs.
57	28+26	2.1	3.5	1.4		10.0	
		6.2	7.0	0.8			
		8.0	9.0	1.0			
56	29+50				5.1	8.0	Cobble encountered at 2.8' bgs. Weathered rock encountered at 5.0' bgs.
55	29+88	2.0	2.7	0.7	4.0	11.0	Softer material encountered between 9.8' and 10.2' bgs.
54	30+25				5.9	9.0	Weathered rock encountered at 5.1' bgs. Slightly softer rock encountered at 8.8' bgs.
53	30+48				1.2	9.3	Slightly softer rock encountered at 6.8' and at 8.8' bgs. Rock became harder at 9.0' bgs.
52	30+67				5.2	8.2	Soil with rock fragments encountered at 3.5' bgs. One-inch-thickness soil seam encountered at 6.5' bgs.
51	30+88	3.1	5.1	2.0	7.7	9.0	Soil with rock fragments encountered from GS to 3' bgs.
50	31+08				6.0	9.0	Cobbles encountered at 2.0' and 4.0' bgs.
49	31+35	5.1	6.5	1.4	8.0	10.0	Soil with rock fragments encountered at GS. Cobble encountered between 1.2' and 1.3' bgs.
48	31+60	3.8	5.0	1.2	8.1	13.0	
47	31+88				5.0	8.8	Soil with rock fragments encountered at 3.0' bgs. Weathered rock encountered at 4.0' bgs
46	34+65	0.0	2.3	2.3	5.3	9.0	

Table 2 - Summary of Confirmatory Drill (Page 3 of 5)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

Confirmatory Drill No.	Station	Boulder			Bedrock	EOCD	Notes
		TOB (ft, bgs)	BOB (ft, bgs)	Thickness (ft)	TOR (ft,bgs)	(ft,bgs)	
45	34+90	0.0	0.5	0.5	4.8	8.0	
		3.0	4.0	1.0			
44	35+38	4.5	5.0	0.5	8.0	10.5	Dense soil encountered at GS. Soil with rock fragmetns encountered between 2.0' and 4.0' bgs.
43	36+07	0.0	1.0	1.0	6.5	9.0	
42	36+64				5.8	9.3	Dense soil encountered at 4.0' bgs. Softer rock encountered at 7.9' and 9.0' bgs.
41	37+06				2.1	8.2	Weathered rock encountered at 1.5' bgs.
40	37+48				7.5	9.0	Dense soil encountered between 3.0' and 4.0' bgs.
39	37+90				5.3	8.5	
38	38+53	0.2	1.8	1.6	7.8	10.3	Coarse gravel or small cobble encountered at 4.0' bgs.
		2.4	3.8	1.4			
37	38+93	2.1	3.8	1.7	6.5	9.5	Three-inch-thickness soft material encountered at 7.8' bgs.
36	39+15	3.5	4.0	0.5	5.5	9.0	Cobble encountered at 1.0' bgs.
35A	39+28	2.0	3.0	1.0	8.6	10.0	One-inch-thickness soil seam encountered at 8.0' and 8.5' bgs.
		5.3	8.0	2.7			
		8.1	8.5	0.4			
35	39+75	6.2	7.8	1.6	8.1	9.5	
34	40+55	1.5	2.7	1.2	8.5	10.0	Weathered rock encountered at 8.0' bgs. Comparatively softer bedrock encountered.
33	41+45	1.0	1.1	0.1	10.0	11.0	Soil with rock fragments encountered from 2.0' to 5.0' bgs. Weathered rock encountered at 9.0' bgs.
32	42+08	0.0	1.8	1.8	3.8	9.5	
31	42+45	2.0	4.8	2.8		14.0	
		11.0	13.5	2.5			
30	42+88	0.5	1.8	1.3	6.5	12.5	
		2.0	2.3	0.3			
29	43+69				0.5	13.0	
28	44+06	4.5	4.8	0.3	9.2	11.5	
		6.6	6.9	0.3			
		7.5	8.5	1.0			
27	44+44	4.0	5.7	1.7		11.8	
		10.5	11.0	0.5			

Table 2 - Summary of Confirmatory Drill (Page 4 of 5)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

Confirmatory Drill No.	Station	Boulder			Bedrock	EOCD	Notes
		TOB (ft, bgs)	BOB (ft, bgs)	Thickness (ft)	TOR (ft,bgs)	(ft,bgs)	
26	45+13	1.5	2.2	0.7		11.0	Harder drilling observed at 5.0' bgs. Soil with rock fragments encountered between 6.0' and 7.0' bgs.
		9.5	10.0	0.5			
25	45+47				7.8	13.5	
24	45+98					11.0	Harder drilling observed between 4.5' and 7.0' bgs.
23	46+41					10.0	
22	46+84	2.0	2.5	0.5		11.0	
21	47+27					11.0	
20	48+25	2.5	2.8	0.3		10.0	
19	49+06	6.8	9.0	2.2	10.5	11.0	
18	49+44					10.0	
17	49+82	1.8	2.5	0.7		12.0	
16	51+37				12.5	18.0	
15	51+84					17.0	Soil with rock fragments encountered at 17.0' bgs. Harder drilling observed at 15.5' bgs.
14	52+31					16.0	Harder drilling observed from 4.7' to 7.0' bgs.
13	52+78					16.0	
12	53+25	2.0	2.5	0.5		17.0	
11	53+72	1.7	2.7	1.0	10.5	10.5	
10	54+65				10.5	12.0	Groundwater encountered at approximately 10.5' bgs.
9	55+20	2.3	6.7	4.4		10.0	Weathered rock encountered at 9.0' bgs.
8	56+20				11.5	11.5	Harder drilling observed at 1.5' bgs. Weathered rock encountered at 8.0' bgs.
7	56+40				9.0	9.1	Weathered rock encountered at 8.8' bgs.
6	57+00					7.5	Hard drilling observed at 7.0' bgs.
5	57+40				9.0	10.0	Weathered rock encountered at 7.5' bgs.
4	57+90	0.0	1.7	1.7	7.5	10.0	Weathered rock encountered at 6.5' bgs.
3	58+60				7.5	10.0	Weathered rock encountered at 5.9' bgs.
2	59+31	2.0	2.8	0.8	8.5	10.0	Weathered rock encountered at 6.0' bgs.
		3.8	6.0	2.9			
1	59+88	5.0	6.3	1.3	8.3	10.0	

Table 2 - Summary of Confirmatory Drill (Page 5 of 5)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

Confirmatory Drill No.	Station	Boulder			Bedrock	EOCD	Notes
		TOB (ft, bgs)	BOB (ft, bgs)	Thickness (ft)	TOR (ft,bgs)	(ft,bgs)	
Minimum		*0.0*	*0.5*	*0.1*	*0.5*	*0.8*	
Maximum		*13.0*	*13.5*	*5.0*	*12.5*	*18.0*	
Average		*3.6*	*5.0*	*1.4*	*6.9*	*10.3*	

Notes:

TOB = Top of Boulder
BOB = Bottom of Boulder
TOR = Top of Rock
CD = Confirmatory Drill
EOCD = End of Confirmatory Drill
bgs = Below Existing Ground Surface
NM = Not Measurable
GS = Ground Surface

Table 3 - Excavation Zone Classification (Page 1 of 4)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

LOCATION				EXCAVATION ZONE*				NOTES
No.	Begin Station	End Station	Distance (ft)	**Zone A** Soil Only/ Length (ft)	**Zone B** Bedrock/ Length (ft)	**Zone C** Boulders/ Length (ft)	**Zone D** Boulders and Bedrock/ Length (ft)	
1	00+00	02+60	260		260			
2	02+60	03+10	50			50		
3	03+10	03+30	20				20	Confirmatory drill could not be completed due to access restraints. Rubble rock fill may be present in the vicinity of Sta. 8+70.
4	03+30	03+45	15		15			
5	03+45	03+65	20	20				
6	03+65	06+00	235		235			
7	06+00	06+85	85	85				
8	06+85	07+10	25		25			
9	07+10	07+40	30	30				
10	07+40	08+00	60		60			
11	08+00	08+55	55	55				
12	08+55	09+15	60			60		
13	09+15	11+90	275	275				
14	11+90	11+95	5			5		
15	11+95	12+40	45	45				
16	12+40	12+70	30			30		
17	12+70	13+80	110	110				
18	13+80	14+30	50			50		
19	14+30	15+35	105	105				
20	15+35	16+10	75			75		Construction debris may be present.
21	16+10	16+25	15	15				
22	16+25	18+35	210			210		
23	18+35	18+90	55	55				
24	18+90	19+00	10		10			
25	19+00	22+65	365			365		
26	22+65	23+00	35	35				
27	23+00	23+70	70			70		
28	23+70	24+35	65				65	
29	24+35	25+10	75		75			

Table 3 - Excavation Zone Classification (Page 2 of 4)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

LOCATION				EXCAVATION ZONE*				NOTES
No.	Begin Station	End Station	Distance (ft)	**Zone A** Soil Only/ Length (ft)	**Zone B** Bedrock/ Length (ft)	**Zone C** Boulders/ Length (ft)	**Zone D** Boulders and Bedrock/ Length (ft)	
30	25+10	25+20	10	10				
31	25+20	26+25	105			105		
32	26+25	26+80	55	55				
33	26+80	27+10	30			30		
34	27+10	27+35	25	25				
35	27+35	28+70	135			135		
36	28+70	29+30	60	60				
37	29+30	29+70	40		40			
38	29+70	30+10	40				40	
39	30+10	30+70	60		60			
40	30+70	30+95	25				25	
41	30+95	31+20	25		25			
42	31+20	31+70	50			50		
43	31+70	31+95	25		25			
44	31+95	32+25	30	30				Confirmatory drill could not be completed between Sta. 31+95 and Sta. 34+60 due to access restraints.
45	32+25	32+45	20			20		
46	32+45	35+05	260				260	
47	35+05	35+80	75			75		
48	35+80	36+05	25		25			
49	36+05	36+75	70				70	
50	36+75	37+35	60		60			
51	37+35	37+55	20			20		
52	37+55	38+30	75		75			
53	38+30	39+25	95				95	
54	39+25	39+80	55			55		
55	39+80	40+10	30	30				
56	40+10	41+00	90			90		
57	41+00	41+55	55				55	
58	41+55	42+25	70				70	

Table 3 - Excavation Zone Classification (Page 3 of 4)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

LOCATION				EXCAVATION ZONE*				NOTES
No.	Begin Station	End Station	Distance (ft)	**Zone A** Soil Only/ Length (ft)	**Zone B** Bedrock/ Length (ft)	**Zone C** Boulders/ Length (ft)	**Zone D** Boulders and Bedrock/ Length (ft)	
59	42+25	42+60	35			35		
60	42+60	43+10	50				50	
61	43+10	43+30	20	20				
62	43+30	43+85	55		55			
63	43+85	44+80	95			95		
64	44+80	45+00	20	20				
65	45+00	45+25	25			25		
66	45+25	45+55	30				30	
67	45+55	47+75	220			220		
68	47+75	48+10	35	35				
69	48+10	54+90	680			680		
70	54+90	55+10	20	20				
71	55+10	55+20	10			10		
72	55+20	55+70	50	50				
73	55+70	55+75	5			5		
74	55+75	56+00	25	25				
75	56+00	57+80	180			180		
76	57+80	58+10	30				30	
77	58+10	58+70	60		60			
78	58+70	59+15	45	45				
79	59+15	59+25	10		10			
80	59+25	59+90	65				65	
81	59+90	60+15	25				25	Confirmatory drill could not be completed due to access restraints.
82	60+15	61+50	135			135		
83	61+50	62+50	100				100	
84	62+50	62+75	25			25		
85	62+75	63+05	30		30			
86	63+05	63+30	25			25		
87	63+30	63+85	55				55	

Table 3 - Excavation Zone Classification (Page 4 of 4)
Transco LSE Skillman Loop - Princeton Ridge
Princeton, New Jersey

LOCATION				EXCAVATION ZONE*				NOTES
No.	Begin Station	End Station	Distance (ft)	**Zone A** Soil Only/ Length (ft)	**Zone B** Bedrock/ Length (ft)	**Zone C** Boulders/ Length (ft)	**Zone D** Boulders and Bedrock/ Length (ft)	
88	63+85	64+30	45		45			Confirmatory drill could not be completed due to access restraints.
89	64+30	65+70	140			140		
90	65+70	66+55	85		85			
91	66+55	67+20	65	65				
92	67+20	67+30	10			10		
93	67+30	67+60	30	30				
94	67+60	67+95	35			35		
95	67+95	68+20	25	25				
	Total Length		**6,820**	**1,375**	**1,275**	**3,115**	**1,055**	
	(%)		**100%**	**20%**	**19%**	**46%**	**15%**	

Notes:

* Excavation Zone is classified based on potential subsurface material that will likely be encountered from existing ground surface to eight feet depth (i.e., proposed pipeline invert depth) during the proposed open-trench excavation based on the subsurface investigation findings.

The figures and appendices that were filed with Transco's *Comprehensive Rock Handling Plan for the Princeton Ridge segment of the Skillman Loop* that was filed on May 6, 2014 are too voluminous to include in this EA, but can be viewed on the FERC website at http://www.ferc.gov. Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the" Docket Number" field (i.e., CP13-551). Be sure to select the appropriate date range. The plan can be found under Accession No. 20140506-5178.

APPENDIX E

ADDITIONAL TEMPORARY EXTRA WORKSPACES BY MILEPOST

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
Skillman Loop				
Mercer, NJ				
SK-01A	1776.8	0.10	Developed Open Space/Deciduous Forest	Sewer Line Crossing
SK-01	1777.58	0.19	Developed Open Space/Deciduous Forest	Crossover/PI
SK-02	1777.59	0.02	Developed Open Space/Deciduous Forest	Crossover/PI
SK-03	1777.95	0.01	Developed Open Space	PI
SK-04	1777.99	0.01	Developed Open Space	PI
SK-04A	1778.05	0.03	Developed Open Space	Stream Crossing
SK-05	1778.07	0.01	Developed Open Space	Road Crossing
Somerset, NJ				
SK-06	1778.1	2.50	Cultivated Crops	Truck Turn Around/Road Crossing/Crossover/PI
SK-07	1778.1	0.97	Cultivated Crops	Topsoil Segregation/Road Crossing/Crossover/PI
SK-08	1778.29	0.04	Deciduous Forest	Stream Crossing
SK-09	1778.31	0.04	Deciduous Forest	Stream Crossing
SK-10	1778.37	0.02	Wetland - PEM	Wetland Crossing
SK-11	1778.4	0.04	Deciduous Forest	Stream Crossing
SK-12	1778.45	0.04	Mixed Forest	Stream Crossing
SK-13	1778.6	0.10	Deciduous Forest	PI
SK-14	1778.55	0.25	Deciduous Forest	HDD Stringing/Stream Crossing/PI
SK-15	1778.68	0.15	Pasture/Hay	Stream Crossing
SK-16	1778.68	1.31	Pasture/Hay	Topsoil Segregation/HDD Exit
SK-16A	1778.86	0.12	Pasture/Hay	Topsoil Segregation/HDD Exit
SK-16B	1779.28	0.15	Deciduous Forest	HDD Entry
SK-16C	1779.28	0.70	Deciduous Forest/Developed Open Space	HDD Entry
SK-16D	1779.85	0.41	Cultivated Crop	HDD Equipment Offloading/Topsoil Segregation
SK-16E	1779.95	0.66	Cultivated Crop	Topsoil Segregation/HDD Exit
SK-27	1779.95	0.30	Cultivated Crop	Topsoil Segregation/ HDD Exit
SK-28	1780.01	0.16	Cultivated Crop	Topsoil Segregation
SK-29	1780.08	0.30	Cultivated Crop	Topsoil Segregation/Crossover
SK-30	1779.99	0.37	Cultivated Crop	HDD Stringing/Topsoil Segregation/Crossover/PI
SK-31	1780.23	0.01	Wetland - PEM	Wetland Crossing
SK-32	1789.25	0.14	Deciduous Forest	Stream Crossing
SK-33	1780.29	0.67	Pasture/Hay	Road Crossing/Stream Crossing/Topsoil Segregation
SK-35	1780.48	0.19	Pasture/Hay	Road Crossing/Topsoil Segregation
SK-37	1780.55	1.44	Pasture/Hay	Topsoil Segregation/Road Crossing
SK-38	1781	0.08	Developed Low Intensity/Residential/Deciduous Forest	Road Crossing/Topsoil Segregation/PI

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
SK-39	1781.01	0.16	Developed Low Intensity/Residential/Deciduous Forest	Topsoil Segregation/PI
SK-40	1781.05	0.23	Mixed Forest	Stream Crossing
SK-41	1781.1	0.14	Mixed Forest	Stream Crossing
SK-42	1781.42	0.04	Evergreen Forest/Developed Open Space	Road Crossing
SK-43	1781.43	0.03	Developed Open Space	Road Crossing
SK-44	1781.45	0.10	Evergreen Forest/Developed Open Space	Road Crossing/Crossover/PI
SK-45	1781.55	0.24	Developed Low Intensity/Residential	Topsoil Segregation/Road Crossing
SK-46	1781.65	0.13	Developed Low Intensity/Residential	Topsoil Segregation
SK-47	1781.7	0.07	Developed Low Intensity/Residential	Topsoil Segregation
SK-48	1781.73	0.23	Developed Low Intensity/Residential	Topsoil Segregation
SK-49	1781.79	0.08	Developed Low Intensity/Residential	Road Crossing
SK-50	1781.8	0.03	Developed Open Space/Mixed Forest	Road Crossing
SK-51	1782.01	0.03	Developed Open Space	Road Crossing
SK-52	1782.02	0.02	Developed Open Space/Deciduous Forest	Road Crossing
SK-53	1782.05	0.06	Deciduous Forest	Road Crossing/Stream Crossing
SK-55	1782.09	0.29	Developed Open Space	Topsoil Segregation/Stream Crossing
SK-56	1782.18	0.02	Developed Low Intensity/Residential	Road Crossing
SK-57	1782.18	0.02	Developed Open Space/Deciduous Forest	Road Crossing
SK-58	1782.2	0.04	Developed Low Intensity/Residential/Developed Open Space	Road Crossing
SK-59	1782.2	0.02	Developed Low Intensity/Residential/Mixed Forest	Road Crossing
SK-61	1782.29	0.14	Developed Low Intensity/Residential/Deciduous Forest	Road Crossing/Topsoil Segregation
SK-62	1782.35	0.22	Developed Low Intensity/Residential	Road Crossing/Topsoil Segregation
SK-63	1782.45	0.01	Wetland - PEM	Wetland Crossing
SK-64	1782.55	0.07	Pasture/Hay	Topsoil Segregation
SK-65	1782.58	0.14	Wetland - PEM	Wetland Crossing
SK-66	1782.67	1.20	Pasture/Hay	Railroad Crossing/Topsoil Segregation/Truck Turn Around/Crossover/PI
SK-67	1782.68	1.77	Pasture/Hay	Railroad Crossing/Topsoil Segregation/Truck Turn Around/Crossover/PI
SK-68	1782.77	0.02	Commercial/Industrial/Transportation/ Mixed Forest	Road Crossing
SK-69	1782.76	0.66	Mixed Forest/Cultivated Crops	Road Crossing/Railroad Crossing/Topsoil Segregation/Truck Turn Around
SK-70	1782.79	0.38	Mixed Forest/Cultivated Crops	Road Crossing
SK-71	1782.9	0.54	Evergreen Forest	Truck Turn Around/Railroad Crossing

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
Skillman Loop Total	--	*18.66*	--	--
Pleasant Run Loop				
Somerset, NJ				
PR-01	0.25	0.13	Pasture/Hay/Scrub Shrub Upland	Topsoil Segregation
PR-02	0.38	0.01	Pasture/Hay	Stream Crossing
PR-03	0.40	0.01	Pasture/Hay	Stream Crossing
PR-04	0.39	0.42	Pasture/Hay	Topsoil Segregation/Stream Crossing
PR-05	0.50	0.33	Pasture/Hay	Topsoil Segregation
PR-06	0.60	0.08	Cultivated Crops	Topsoil Segregation
PR-07	0.62	0.04	Cultivated Crops/Developed Open Space	Stream Crossing
PR-08	0.64	0.21	Cultivated Crop	Topsoil Segregation
PR-09	0.64	0.04	Developed Open Space	Stream Crossing
PR-10	0.70	0.06	Mixed Forest/Developed Open Space	Stream Crossing
PR-11	0.73	0.06	Mixed Forest/Developed Open Space	Stream Crossing
PR-13	0.78	0.80	Cultivated Crops	Topsoil Segregation/Foreign Line Crossing
PR-14	0.95	0.03	Mixed Forest	PI
PR-15	0.95	0.22	Developed Open Space	PI/Topsoil Segregation
PR-16	1.00	0.14	Mixed Forest	PI/Stream Crossing
PR-17	1.03	0.73	Cultivated Crops	Topsoil Segregation/Stream Crossing/PI
PR-21	1.20	0.64	Developed Open Space/Low Intensity/Residential	PI/Stream Crossing/Side Slope/Road Crossing
PR-22	1.29	0.30	Developed Open Space/Mixed Forest	Truck Turn Around/PI/Topsoil Segregation/Staging Area/Crossover
Hunterdon, NJ				
PR-26	1.38	0.09	Mixed Forest	Road Crossing
PR-27	1.39	0.16	Developed Open Space	Stream Crossing/Road Crossing
PR-28	1.45	0.08	Developed Open Space	Stream Crossing
PR-30	1.49	0.15	Mixed Forest	Road Crossing/Topsoil Segregation
PR-31	1.49	0.33	Developed Open Space	Road Crossing/Topsoil Segregation
PR-32	1.60	0.23	Developed Open Space	Road Crossing/Stream Crossing
PR-33	1.60	0.29	Scrub Shrub Uplands	Road Crossing
PR-35	1.68	0.09	Scrub Shrub Uplands	Stream Crossing
PR-36	1.73	0.05	Developed Open Space	Road Crossing/Stream Crossing
PR-38	1.74	0.15	Developed Open Space	Road Crossing
PR-39	1.74	0.32	Developed Open Space	Road Crossing/Topsoil Segregation
PR-40	1.85	0.99	Mixed Forest/Developed Open Space/Cultivated Crop	Road Crossing/Topsoil Segregation
PR-41	1.89	0.08	Mixed Forest	Side Slope
PR-42	2.01	0.16	Cultivated Crop	Topsoil Segregation
PR-43	2.08	0.68	Cultivated Crop	Topsoil Segregation

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
PR-44	2.28	0.09	Pasture/Hay	Topsoil Segregation
PR-45	2.29	0.10	Pasture/Hay	Stream Crossing
PR-46	2.31	0.17	Pasture/Hay	Topsoil Segregation
PR-47	2.36	0.10	Pasture/Hay	Topsoil Segregation
PR-48	2.38	0.75	Pasture/Hay	Topsoil Segregation
PR-49	2.60	0.06	Scrub Shrub Uplands	Side Slope/Stream Crossing
PR-50	2.63	0.03	Wetland - PEM	Wetland Crossing
PR-51	2.65	0.30	Developed Low Intensity/Residential	Road Crossing/Topsoil Segregation
PR-52	2.73	0.37	Pasture/Hay	Stream Crossing/Road Crossing/Topsoil Segregation
PR-53	2.81	0.04	Pasture/Hay	Stream Crossing
PR-54	2.83	0.49	Developed Low Intensity/Residential	Stream Crossing
PR-55	2.88	0.15	Developed Low Intensity/Residential	Crossover/PI
PR-56	2.95	0.13	Wetland - PEM	Wetland Crossing
PR-57	3.18	0.02	Developed Open Space	Stream Crossing
PR-58	3.21	0.18	Developed Low Intensity/Residential/Deciduous Forest	Road Crossing/Topsoil Segregation/Stream Crossing
PR-59	3.21	0.13	Developed Low Intensity/Residential/Developed Open Space	Topsoil Segregation/Road Crossing/Stream Crossing
PR-60	3.28	0.11	Mixed Forest	Road Crossing/Stream Crossing/PI
PR-61	3.28	0.17	Developed Open Space	Road Crossing/Stream Crossing/PI
PR-63	3.35	0.09	Developed Low Intensity/Residential	Stream Crossing
PR-64	3.39	0.38	Developed Low Intensity/Residential	Stream Crossing/Topsoil Segregation/Hydrostatic Test Withdrawal/Discharge
PR-65	3.60	0.04	Developed Open Space	Stream Crossing
PR-66	3.63	0.28	Pasture/Hay	Stream Crossing/Topsoil Segregation
PR-67	3.65	0.04	Pasture/Hay	Stream Crossing
PR-68	3.71	0.30	Developed Open Space	Topsoil Segregation
PR-69	3.91	0.09	Developed Open Space	Road Crossing
PR-68A	3.93	0.26	Developed Open Space	Road Crossing
PR-70	4.05	0.25	Developed Open Space/Pasture/Hay	Topsoil Segregation
PR-71	4.17	0.16	Developed Open Space/Mixed Forest	Stream Crossing
PR-72	4.23	0.05	Mixed Forest	Stream Crossing
PR-73	4.38	0.10	Mixed Forest	Stream Crossing
PR-74	4.45	0.06	Developed Open Space	Stream Crossing
PR-75	4.46	0.13	Mixed Forest	Stream Crossing
PR-76	4.49	0.09	Developed Open Space	Stream Crossing
PR-77	4.91	0.23	Developed Open Space/Mixed Forest	Stream Crossing/Topsoil Segregation
PR-78	4.92	0.10	Developed Open Space/Mixed Forest	Stream Crossing
PR-79	4.98	0.10	Developed Open Space/Mixed Forest	Stream Crossing
PR-80	4.99	0.16	Mixed Forest	Stream Crossing

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
PR-81	5.04	0.03	Developed Open Space/Mixed Forest	Stream Crossing
PR-82	5.06	0.05	Mixed Forest	Stream Crossing
PR-83	5.07	0.02	Commercial/Industrial/Transportation	Stream Crossing
PR-84	5.12	0.11	Pasture/Hay	Road Crossing/Stream Crossing/Topsoil Segregation
PR-84A	5.20	0.26	Pasture/Hay	Road Crossing/Topsoil Segregation
PR-84B	5.26	0.33	Pasture/Hay	Topsoil Segregation/Crossover/PI
PR-84C	5.26	0.33	Pasture/Hay	Topsoil Segregation/Crossover/PI
PR-85	5.35	0.23	Pasture/Hay	Topsoil Segregation
PR-85A	5.41	0.05	Wetland - PEM	Wetland Crossing
PR-86	5.45	0.50	Developed Open Space/Pasture/Hay/Deciduous Forest	Topsoil Segregation/Side Slope/Stream Crossing
PR-87	5.53	0.02	Developed Open Space	Stream Crossing
PR-88	5.58	0.81	Pasture/Hay	Topsoil Segregation/Crossover/PI/Stream Crossing
PR-89	5.59	0.58	Pasture/Hay	Topsoil Segregation/Crossover/PI/Stream Crossing
PR-89A	5.73	0.06	Pasture/Hay	Stream Crossing
PR-90	5.78	0.13	Developed Low Intensity/Residential	Stream Crossing/Topsoil Segregation
PR-91	5.79	0.28	Developed Low Intensity/Residential	Stream Crossing/Topsoil Segregation
PR-93	5.88	0.06	Developed Low Intensity/Residential	Road Crossing
PR-94	5.90	0.04	Developed Low Intensity/Residential/Mixed Forest	Road Crossing
PR-95	5.93	0.27	Pasture/Hay	Topsoil Segregation
PR-96	6.05	0.24	Developed Open Space	Topsoil Segregation
PR-97	6.12	0.03	Mixed Forest	Stream Crossing/PI
PR-98	6.17	0.03	Mixed Forest/Grassland	Stream Crossing/PI
PR-99	6.19	0.09	Developed Open Space/Pasture/Hay	Topsoil Segregation/Stream Crossing
PR-100	6.21	0.44	Pasture/Hay	Topsoil Segregation
PR-101	6.31	0.25	Pasture/Hay	Topsoil Segregation
PR-102	6.39	0.33	Pasture/Hay	Topsoil Segregation
PR-103	6.47	0.24	Pasture/Hay	Topsoil Segregation/Stream Crossing
PR-104	6.55	0.12	Pasture/Hay	Topsoil Segregation/Stream Crossing
PR-104A	6.63	0.02	Developed, Low Intensity/Residential	Spoil Storage
PR-105	6.67	0.14	Developed Open Space	Topsoil Segregation/Road Crossing
PR-106	6.79	0.07	Developed Open Space/Mixed Forest	Spoil Storage
Pleasant Run Loop Total	--	*20.56*	--	--
Franklin Loop				
Monroe, PA				

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
FR-1	57.88	0.09	Developed Open Space	Crossover
FR-2	57.93	0.12	Developed Open Space	Topsoil Segregation
FR-3	58.29	0.56	Developed Open Space	Hydrostatic Test Withdrawal/Discharge
FR-4	58.35	0.28	Mixed Forest	Stream Crossing
FR-5	58.36	0.44	Developed Open Space	Stream Crossing
FR-6	58.42	0.20	Developed Open Space	Stream Crossing
FR-7	58.43	0.14	Mixed Forest	Stream Crossing
FR-9	58.55	0.13	Mixed Forest	Stream Crossing/P.I.
FR-10	58.54	0.32	Mixed Forest/Developed Open Space	Stream Crossing/P.I.
FR-11	58.65	0.21	Mixed Forest/Developed Open Space	Stream Crossing/P.I.
FR-12	58.70	0.23	Mixed Forest	Stream Crossing/Wetland Crossing
FR-13	58.88	0.09	Wetland-PEM	Wetland Crossing
FR-14	58.93	0.11	Mixed Forest	Wetland Crossing
FR-15	59.00	0.02	Wetland-PEM	Wetland Crossing
FR-16	59.05	0.02	Wetland-PEM	Wetland Crossing
FR-17	59.21	0.17	Developed Open Space	Wetland Crossing
FR-18	59.26	0.21	Wetland - PSS	Wetland Crossing
FR-19	59.39	0.28	Developed Open Space	Wetland Crossing
FR-20	59.40	0.08	Mixed Forest	Stream Crossing
FR-21	59.49	0.09	Mixed Forest	Stream Crossing
FR-21A	59.55	0.23	Developed Open Space	Wetland Crossing
FR-22	59.63	0.21	Mixed Forest	Truck Turn Around/Road Crossing
FR-22A	59.65	0.12	Mixed Forest	Road Crossing
FR-23	59.67	0.21	Developed Open Space	Road Crossing
FR-23A	59.69	1.38	Mixed Forest	Truck Turn Around/Road Crossing
FR-24	59.75	0.45	Mixed Forest/Wetland -PSS	Truck Turn Around/Road Crossing
FR-24A	59.75	0.08	Developed Open Space	Truck Turn Around/Road Crossing
FR-25	59.76	0.03	Developed Open Space	Wetland Crossing
FR-26	59.77	0.71	Wetland - PSS	Wetland Crossing
FR-27	60.16	0.76	Mixed Forest	Truck Turn Around/Wetland Crossing
FR-28	60.79	0.06	Mixed Forest	Side Slope
FR-29	60.91	0.71	Developed Open Space	Stream Crossing/Truck Turn Around/Hydrostatic Test Withdrawal/Discharge
FR-30	60.92	0.04	Mixed Forest	Stream Crossing/Truck Turn Around
FR-31	60.97	0.19	Mixed Forest	Stream Crossing/Truck Turn Around
FR-32	61.07	0.11	Mixed Forest	Stream Crossing/Truck Turn Around/PI
FR-33	61.08	0.02	Wetland - PEM	Wetland Crossing
FR-34	61.09	0.23	Mixed Forest	Crossover/PI
FR-35	61.25	0.03	Wetland - PEM	Wetland Crossing
FR-35A	61.63	0.07	Wetland - PEM	Wetland Crossing
FR-36	61.69	0.15	Mixed Forest	Road Crossing/ Cross Over/ PI

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
FR-37	61.70	0.09	Developed Open Space	PI/Crossover
FR-38	61.75	0.06	Mixed Forest	Road Crossing
FR-39	61.75	0.06	Developed Open Space	Road Crossing
FR-40	61.88	0.18	Mixed Forest	PI/Crossover
FR-41	61.89	0.09	Developed Open Space	PI/Crossover
FR-42	61.98	0.01	Mixed Forest/Developed Open Space	Road Crossing
FR-43	62.00	0.03	Mixed Forest/Developed Open Space	Road Crossing
FR-44	62.31	0.04	Wetland - PEM	Wetland Crossing
FR-45	62.37	0.04	Deciduous Forest	Wetland Crossing
FR-46	62.63	0.18	Deciduous Forest	Crossover/PI
FR-47	62.63	0.12	Deciduous Forest\Developed Open Space	Crossover/PI
FR-48	62.85	0.03	Wetland - PEM	Wetland Crossing
FR-49	62.88	0.04	Wetland - PEM	Wetland Crossing
FR-50	63.03	0.10	Mixed Forest	Stream Crossing
FR-51	63.10	0.10	Mixed Forest	Stream Crossing
FR-52	63.15	0.03	Wetland - PEM	Wetland Crossing
FR-53	63.19	0.03	Developed Open Space	Road Crossing
FR-54	63.20	0.07	Developed, Low Intensity/Residential	Road Crossing
FR-54A	63.29	0.34	Pasture/Hay	Topsoil Segregation/Crossover/PI
FR-55	63.45	0.10	Wetland - PEM	Topsoil Segregation/Crossover/PI
FR-55A	63.65	0.22	Developed Open Space	Spoil Storage
FR-56A	63.68	0.14	Developed Open Space	Crossover/PI
FR-56B	63.65	0.11	Developed Open Space	Crossover/PI
FR-56	63.75	0.10	Deciduous Forest	Stream Crossing
FR-57	64.00	0.78	Developed Open Space/Deciduous Forest	Crossover/Wetland Crossing/PI
FR-58	64.15	0.52	Wetland - PSS	Wetland Crossing
FR-59	64.43	0.59	Deciduous Forest	Wetland Crossing
FR-60	64.76	0.13	Deciduous Forest	Side Slope
FR-61	64.77	0.39	Developed Open Space	Side Slope
FR-62	64.83	0.14	Deciduous Forest	Side Slope
FR-63	64.91	0.09	Developed Open Space	Stream Crossing
FR-65	64.95	0.32	Developed Open Space	Stream Crossing/Road Crossing
FR-66	64.99	0.06	Deciduous Forest	Road Crossing
FR-67	65.03	0.07	Deciduous Forest	Road Crossing
FR-68	65.45	0.41	Developed Open Space/Deciduous Forest	Stream Crossing Hydrostatic Test Withdrawal/Discharge
FR-69	65.45	0.12	Deciduous Forest	Stream Crossing
Luzerne, PA				
FR-70	65.49	0.41	Wetland - PEM/Deciduous Forest	Stream Crossing
FR-71	65.49	0.01	Wetland - PEM	Wetland Crossing
FR-71A	65.55	0.03	Wetland - PEM	Wetland Crossing
FR-73	65.83	0.14	Developed Open Space	Stream Crossing
FR-74	65.89	0.11	Wetland - PFO	Wetland Crossing
FR-75	66.51	0.09	Developed Open Space	Road Crossing

APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
FR-76	66.51	0.08	Deciduous Forest	Road Crossing
FR-77	66.53	0.08	Deciduous Forest	Road Crossing
FR-78	66.53	0.24	Developed Open Space	Road Crossing
FR-79	66.77	0.06	Developed Open Space	Side Slope
FR-80	66.80	0.17	Deciduous Forest	Truck Turn Around
FR-81	66.83	0.03	Wetland - PEM	Wetland Crossing
FR-82	66.88	0.04	Developed Open Space	Wetland Crossing
FR-83	67.75	0.10	Developed Open Space	Stream Crossing
FR-84	67.77	0.09	Deciduous Forest	Stream Crossing
FR-85	67.81	0.05	Developed Open Space	Stream Crossing
FR-86	67.85	0.17	Developed Open Space	Stream Crossing
FR-87	67.91	0.10	Deciduous Forest	Stream Crossing
FR-88	68.05	0.25	Developed Open Space/Deciduous Forest	Stream Crossing/Crossover/PI
FR-89	68.06	0.21	Developed Open Space/Deciduous Forest	Stream Crossing/Crossover/PI
FR-90	68.12	0.03	Wetland - PEM	Wetland Crossing
FR-91	68.15	0.21	Developed Open Space	Topsoil Segregation
FR-92	68.23	0.21	Developed Open Space	Topsoil Segregation
FR-93	68.35	0.20	Developed Open Space	Topsoil Segregation
FR-94	68.41	0.04	Developed Open Space	Topsoil Segregation
FR-95	68.45	0.06	Wetland - PEM	Wetland Crossing
FR-96	68.50	0.30	Deciduous Forest	Crossover/Wetland Crossing/PI
FR-97	68.52	0.20	Developed Open Space	Crossover/PI
Franklin Loop Total	--	*19.22*	--	--
Dorrance Loop				
Luzerne, PA				
DO-1	18.45	0.10	Mixed Forest	Stream Crossing
DO-2	18.55	0.06	Mixed Forest	Road Crossing
DO-3	18.56	0.03	Mixed Forest	Road Crossing
DO-4	18.57	0.06	Mixed Forest	Road Crossing
DO-5	18.57	0.03	Developed Open Space	Road Crossing
DO-6	18.69	0.38	Pasture/Hay	Stream Crossing/ Topsoil Segregation
DO-7	18.81	0.05	Wetland PEM	Wetland Crossing
DO-8	18.91	0.21	Mixed Forest/Pasture/Hay	Topsoil segregation/Stream Crossing
DO-9	19.02	0.17	Mixed Forest/Pasture/Hay	Topsoil segregation/Stream Crossing
DO-10	19.11	0.06	Mixed Forest	Stream Crossing
DO-9.1	19.31	0.04	Mixed Forest	Road Crossing
DO-12	19.32	0.09	Mixed Forest/Developed Open Space	Road Crossing
DO-13	19.35	0.23	Pasture/Hay/ Mixed Forest	Stream Crossing/Road Crossing/Topsoil Segregation
DO-10.1	19.39	0.02	Pasture/Hay	Road Crossing
DO-14	19.45	0.19	Mixed Forest	Stream Crossing
DO-15	19.83	0.07	Mixed Forest/Developed Open Space	Road Crossing

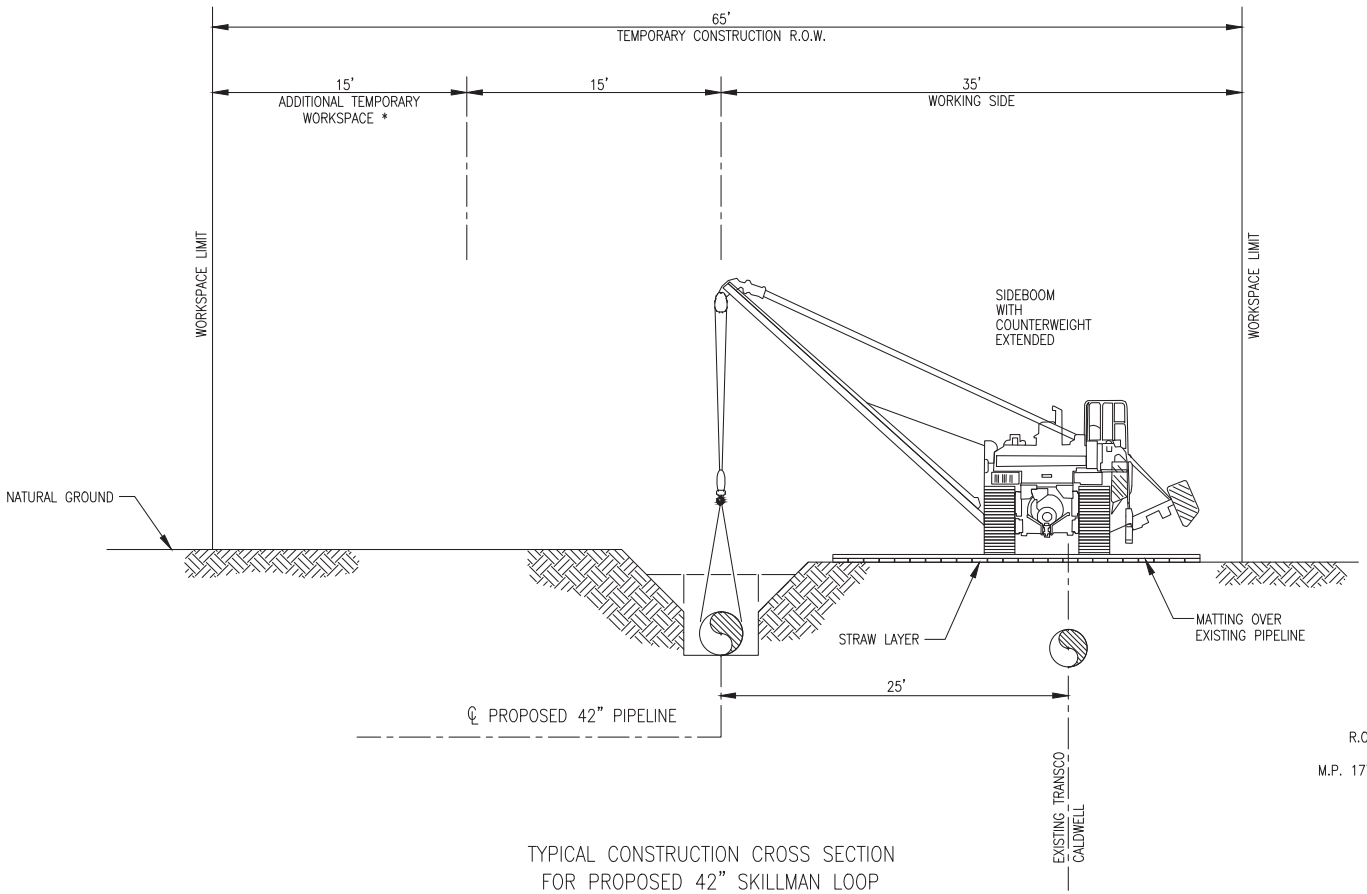
APPENDIX E

Additional Temporary Extra Workspaces by Milepost

Facility/State, County/ATWS Number	Approximate MP	Acres	Existing Land Use Type	Description
DO-16	19.85	0.07	Mixed Forest/Developed Open Space	Road Crossing
DO-17	19.90	0.07	Mixed Forest	Road Crossing
DO-18	20.20	0.07	Mixed Forest	Side Slope
DO-19	20.20	0.04	Developed Open Space	Side Slope
DO-20	20.29	0.13	Mixed Forest	Side Slope
DO-21	20.28	0.13	Developed Open Space	Side Slope
DO-22	20.38	0.11	Mixed Forest	Side Slope
DO-23	20.38	0.06	Developed Open Space	Side Slope
DO-24	20.80	0.18	Mixed Forest	Stream Crossing
DO-25	20.80	0.14	Mixed Forest	Stream Crossing
DO-26	20.85	0.05	Wetland-PEM	Wetland Crossing
DO-27	20.89	0.46	Mixed Forest/Developed Open Space	Road Crossing/Hydrostatic Test Withdrawal/Discharge
DO-28	20.91	0.04	Developed Open Space	Road Crossing
DO-29	20.92	0.05	Mixed Forest/Developed Open Space	Road Crossing
DO-30	20.92	0.04	Developed Open Space	Road Crossing
DO-31	21.60	0.03	Wetland-PEM	Wetland Crossing
DO-32	21.76	0.02	Mixed Forest/Developed Open Space	Stream Crossing
DO-33	21.79	0.02	Mixed Forest/Developed Open Space	Stream Crossing
DO-34	21.80	0.10	Mixed Forest	Stream Crossing
DO-35	22.15	0.02	Developed Open Space	Topsoil Segregation
DO-36	22.28	0.08	Mixed Forest/Developed Open Space	Road Crossing
DO-37	22.27	0.03	Developed Open Space	Road Crossing
DO-38	22.29	0.05	Developed Open Space	Side Slope/Road Crossing
DO-39	22.30	0.03	Wetland-PEM	Wetland Crossing
DO-40	22.35	0.21	Mixed Forest/Cultivated Crops	Stream Crossing
DO-42	22.39	0.32	Cultivated Crops	Stream Crossing/Road Crossing/Topsoil Segregation
DO-43	22.42	0.05	Mixed Forest	Road Crossing
DO-44	22.45	0.05	Developed Open Space	Road Crossing
DO-45	22.52	0.28	Cultivated Crops	Topsoil Segregation
DO-46	22.61	0.13	Cultivated Crops	Topsoil Segregation
DO-47	22.65	0.03	Cultivated Crops	Topsoil Segregation
DO-48	22.68	0.18	Cultivated Crops	Topsoil Segregation
DO-49	22.75	0.07	Mixed Forest	Drag Section
DO-50	22.80	0.12	Wetland-PEM	Wetland Crossing
DO-51	22.89	0.09	Mixed Forest	Road Crossing
DO-52	22.90	0.04	Developed Open Space	Road Crossing
DO-53	22.92	0.07	Mixed Forest/Developed Open Space	Road Crossing
Dorrance Loop Total	--	*5.45*	--	--
Total	--	**63.89**	--	--

APPENDIX F

TYPICAL CONSTRUCTION CROSS SECTIONS



R.O.W SEGMENT

M.P. 1776.79 – 1776.87

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

F-1

ALTHOUGH, NOT PICTORIALLY REPRESENTED ON THE DRAWING, SPOIL MAY BE PLACED WITHIN THE LIMITS OF THE CONSTRUCTION CORRIDOR OR BENEATH THE EQUIPMENT MATS ON AN AS-NEEDED BASIS.

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

MUSTANG OF NEW JERSEY, INC.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-1	SHEET 1
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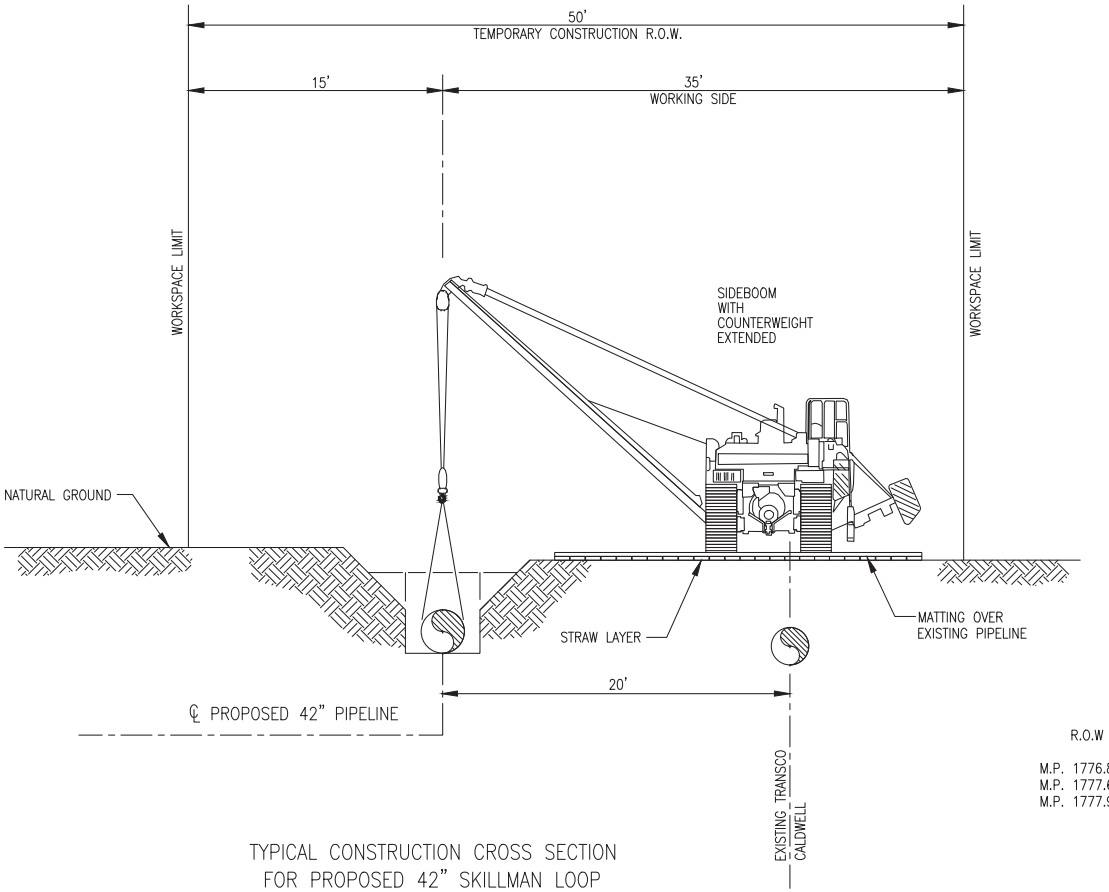

R.O.W SEGMENT

M.P. 1776.87 – 1777.58
M.P. 1777.61 – 1777.96
M.P. 1777.98 – 1778.06

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

F-2

ALTHOUGH, NOT PICTORIALLY REPRESENTED ON THE DRAWING, SPOIL MAY BE PLACED WITHIN THE LIMITS OF THE CONSTRUCTION CORRIDOR OR BENEATH THE EQUIPMENT MATS ON AN AS-NEEDED BASIS.

MUSTANG OF NEW JERSEY, INC.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-2	SHEET 1
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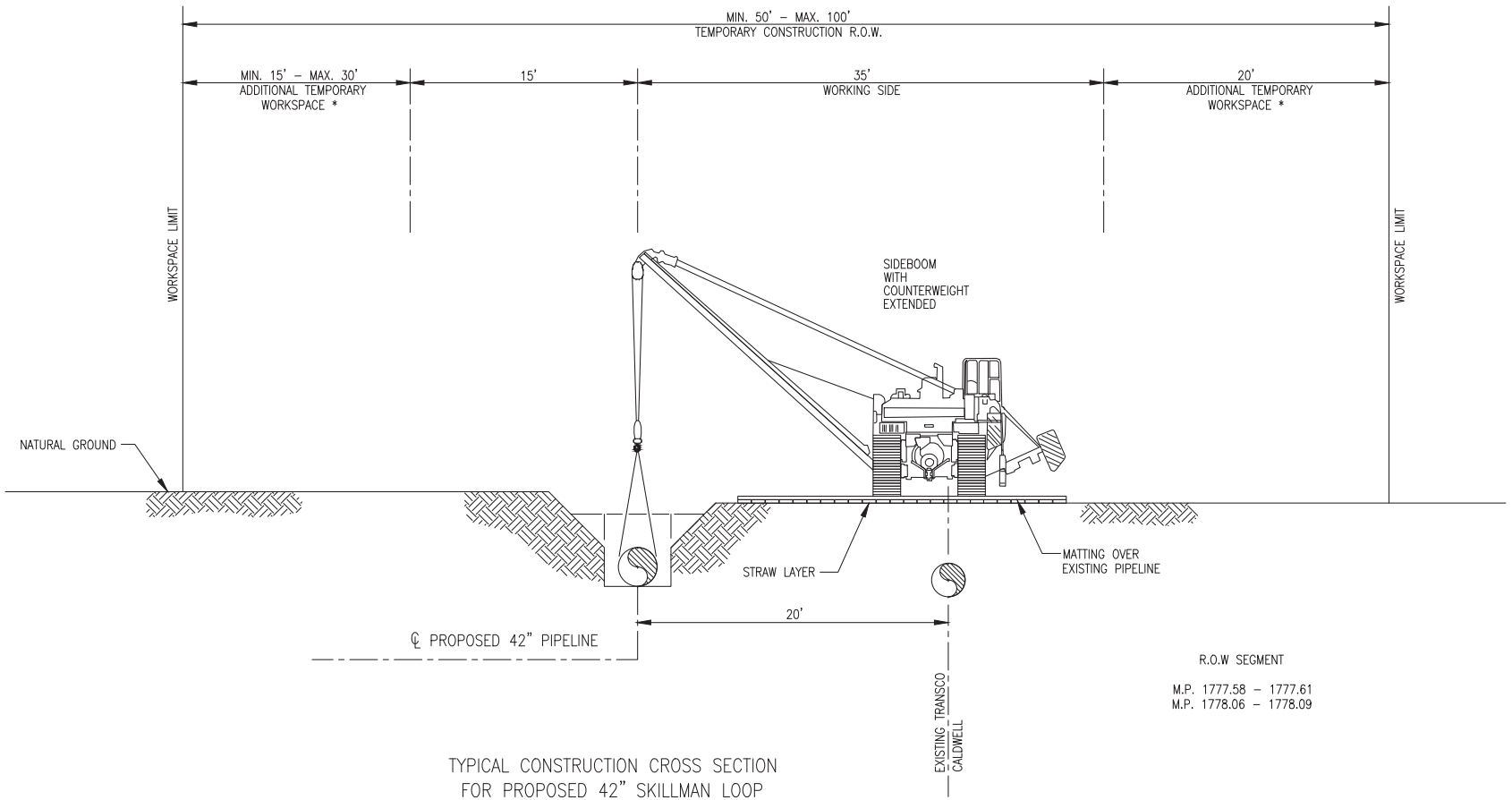

R.O.W SEGMENT

M.P. 1777.58 – 1777.61
M.P. 1778.06 – 1778.09

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

ALTHOUGH, NOT PICTORIALLY REPRESENTED ON THE DRAWING, SPOIL MAY BE PLACED WITHIN THE LIMITS OF THE CONSTRUCTION CORRIDOR OR BENEATH THE EQUIPMENT MATS ON AN AS-NEEDED BASIS.

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

MUSTANG OF NEW JERSEY, INC.

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
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1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-3	SHEET 1
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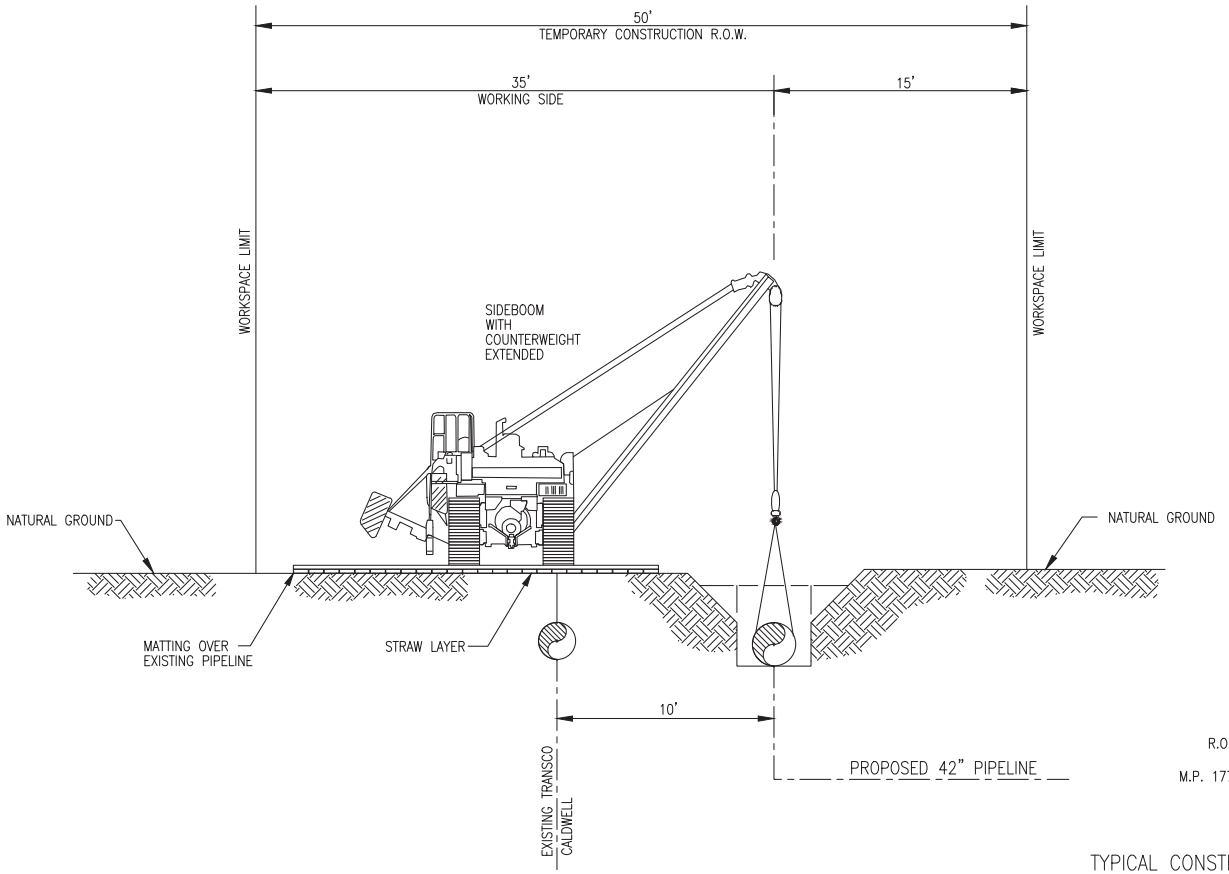
F-3



R.O.W. SEGMENT

M.P. 1777.96 – 1777.98

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

ALTHOUGH, NOT PICTORIALLY REPRESENTED ON THE DRAWING, SPOIL MAY BE PLACED WITHIN THE LIMITS OF THE CONSTRUCTION CORRIDOR OR BENEATH THE EQUIPMENT MATS ON AN AS–NEEDED BASIS.

MUSTANG OF NEW JERSEY, INC.

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-4	SHEET 1
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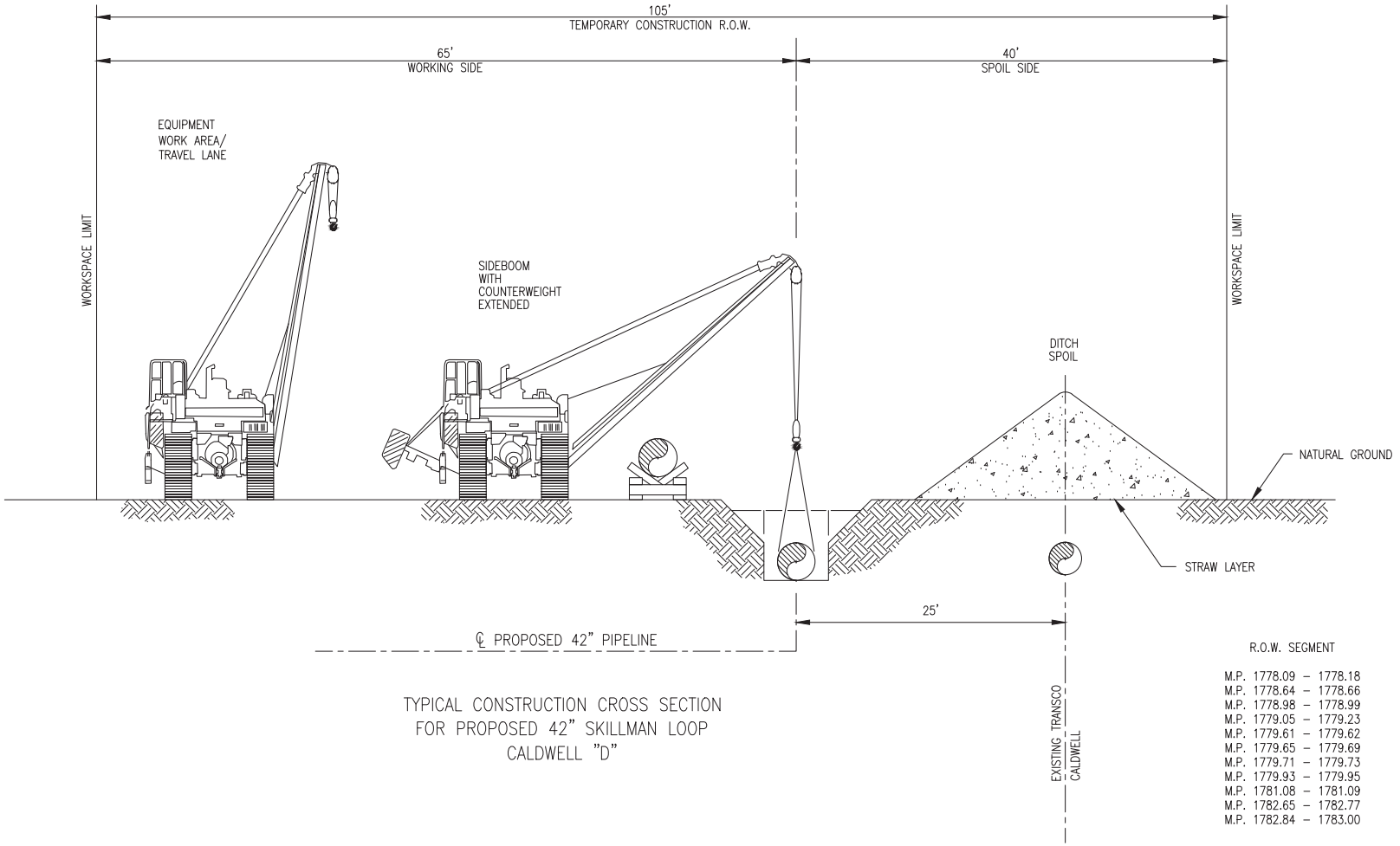
F-4



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

R.O.W. SEGMENT

M.P. 1778.09 – 1778.18
M.P. 1778.64 – 1778.66
M.P. 1778.98 – 1778.99
M.P. 1779.05 – 1779.23
M.P. 1779.61 – 1779.62
M.P. 1779.65 – 1779.69
M.P. 1779.71 – 1779.73
M.P. 1779.93 – 1779.95
M.P. 1781.08 – 1781.09
M.P. 1782.65 – 1782.77
M.P. 1782.84 – 1783.00

F-5

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

MUSTANG OF NEW JERSEY, INC.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-5	SHEET 1
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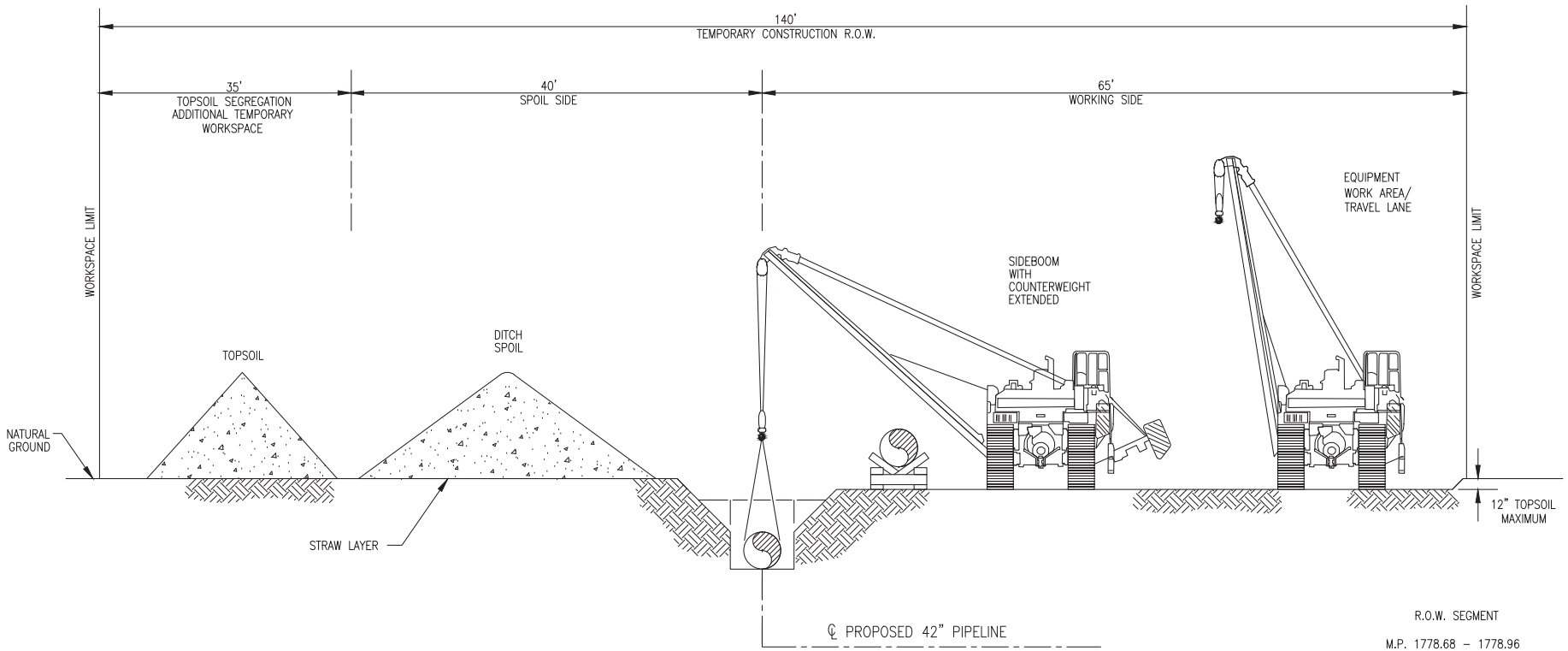

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

F-6

MUSTANG OF NEW JERSEY, INC.

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
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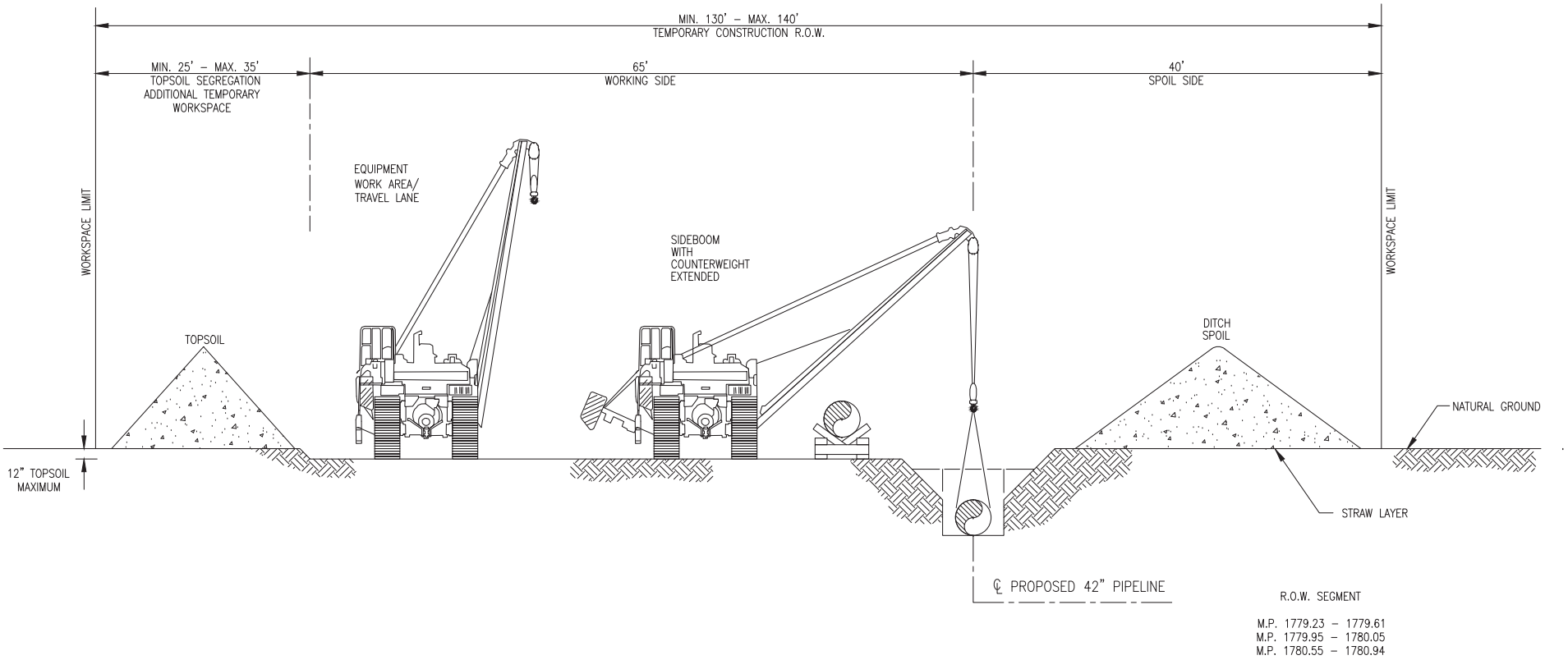


R.O.W. SEGMENT

M.P. 1779.23 – 1779.61
M.P. 1779.95 – 1780.05
M.P. 1780.55 – 1780.94

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

F-7

DRAWING NO.	REFERENCE TITLE

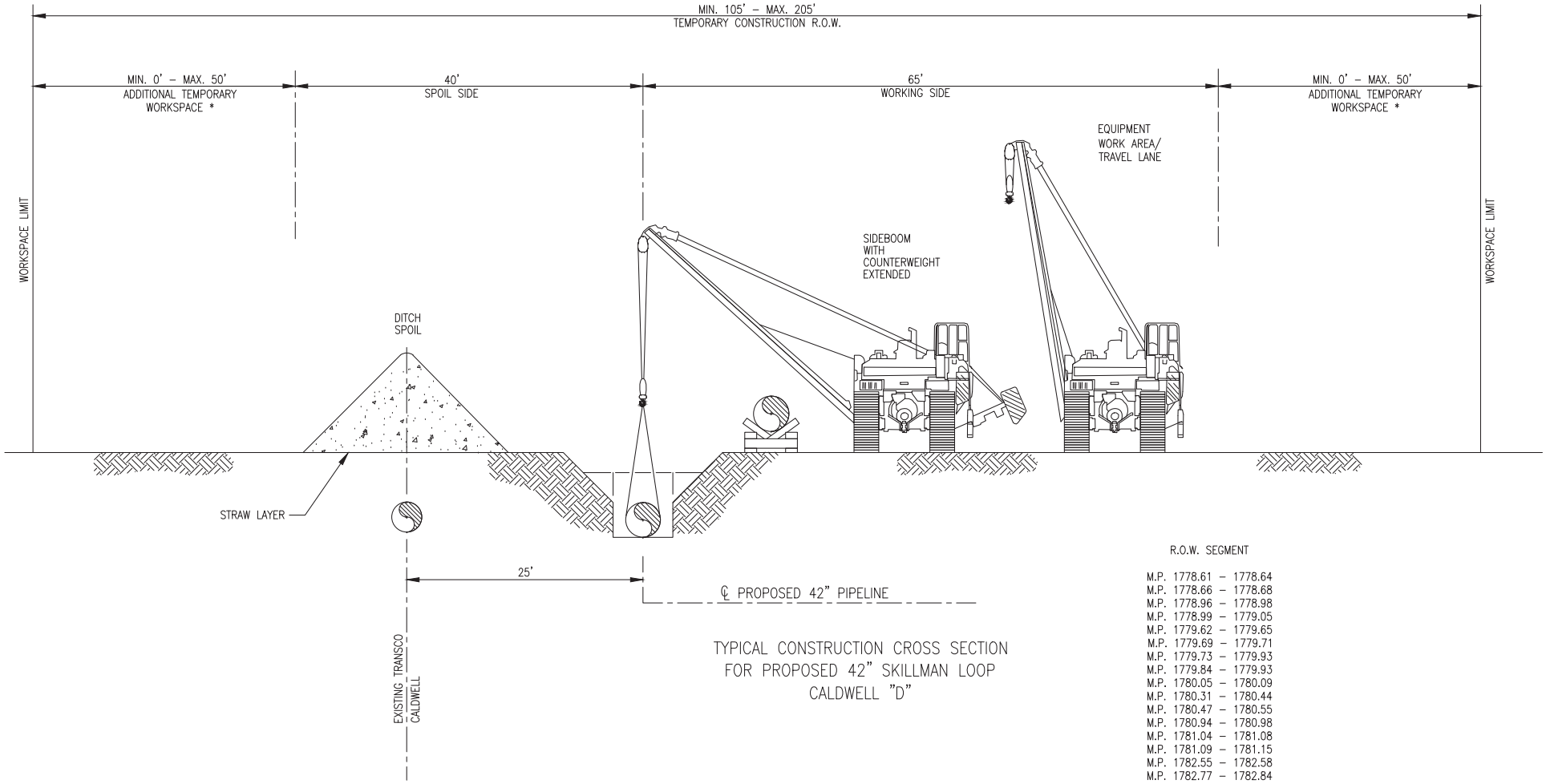
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

MUSTANG OF NEW JERSEY, INC.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-7	SHEET 1
W.O. 1129995		3:45pm 9/18/2013 plgraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-7.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

R.O.W. SEGMENT

M.P. 1778.61 – 1778.64
M.P. 1778.66 – 1778.68
M.P. 1778.96 – 1778.98
M.P. 1778.99 – 1779.05
M.P. 1779.62 – 1779.65
M.P. 1779.69 – 1779.71
M.P. 1779.73 – 1779.93
M.P. 1779.84 – 1779.93
M.P. 1780.05 – 1780.09
M.P. 1780.31 – 1780.44
M.P. 1780.47 – 1780.55
M.P. 1780.94 – 1780.98
M.P. 1781.04 – 1781.08
M.P. 1781.09 – 1781.15
M.P. 1782.55 – 1782.58
M.P. 1782.77 – 1782.84

F-8

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

MUSTANG OF NEW JERSEY, INC.

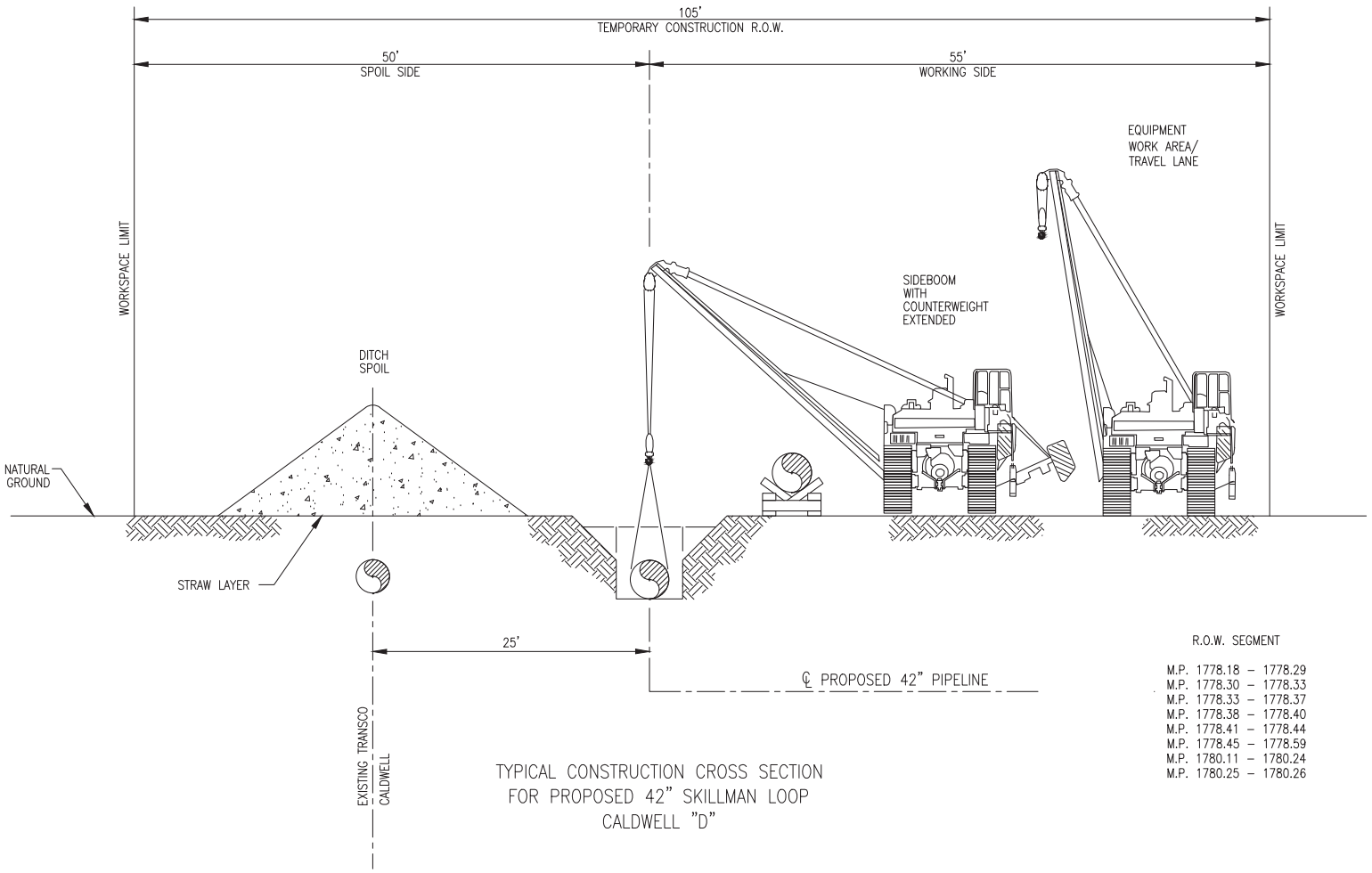
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-8	SHEET 1
W.O. 1129995		9/18/2013 3:46pm plgraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-8.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

R.O.W. SEGMENT

M.P. 1778.18 – 1778.29
M.P. 1778.30 – 1778.33
M.P. 1778.33 – 1778.37
M.P. 1778.38 – 1778.40
M.P. 1778.41 – 1778.44
M.P. 1778.45 – 1778.59
M.P. 1780.11 – 1780.24
M.P. 1780.25 – 1780.26

F-9

DRAWING NO.	REFERENCE TITLE

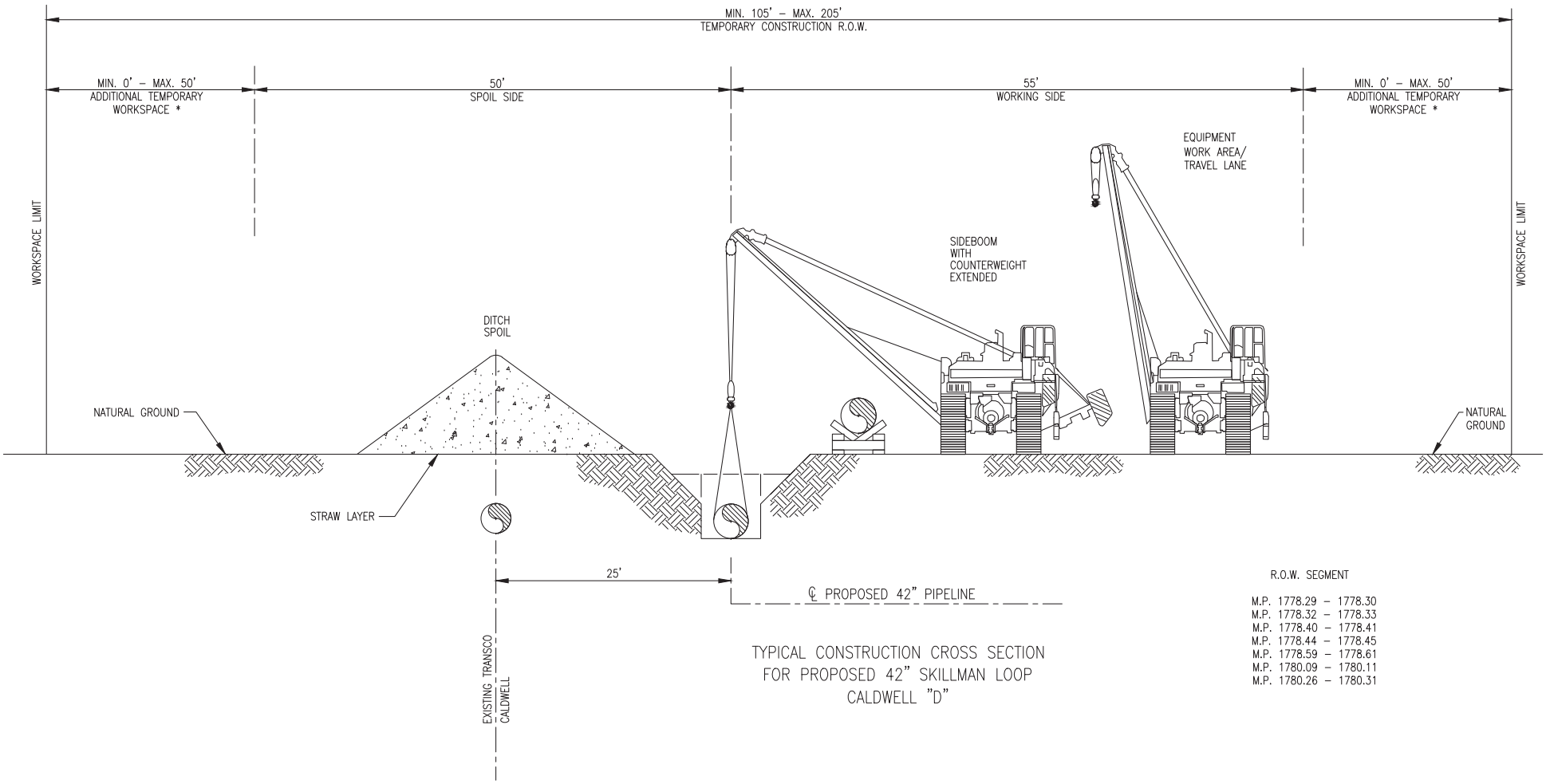
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

MUSTANG OF NEW JERSEY, INC.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-9	SHEET 1
W.O. 1129995		9:46am 9/17/2013 pigraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-9.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

R.O.W. SEGMENT

M.P. 1778.29 – 1778.30
M.P. 1778.32 – 1778.33
M.P. 1778.40 – 1778.41
M.P. 1778.44 – 1778.45
M.P. 1778.59 – 1778.61
M.P. 1780.09 – 1780.11
M.P. 1780.26 – 1780.31

F-10

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

MUSTANG OF NEW JERSEY, INC.

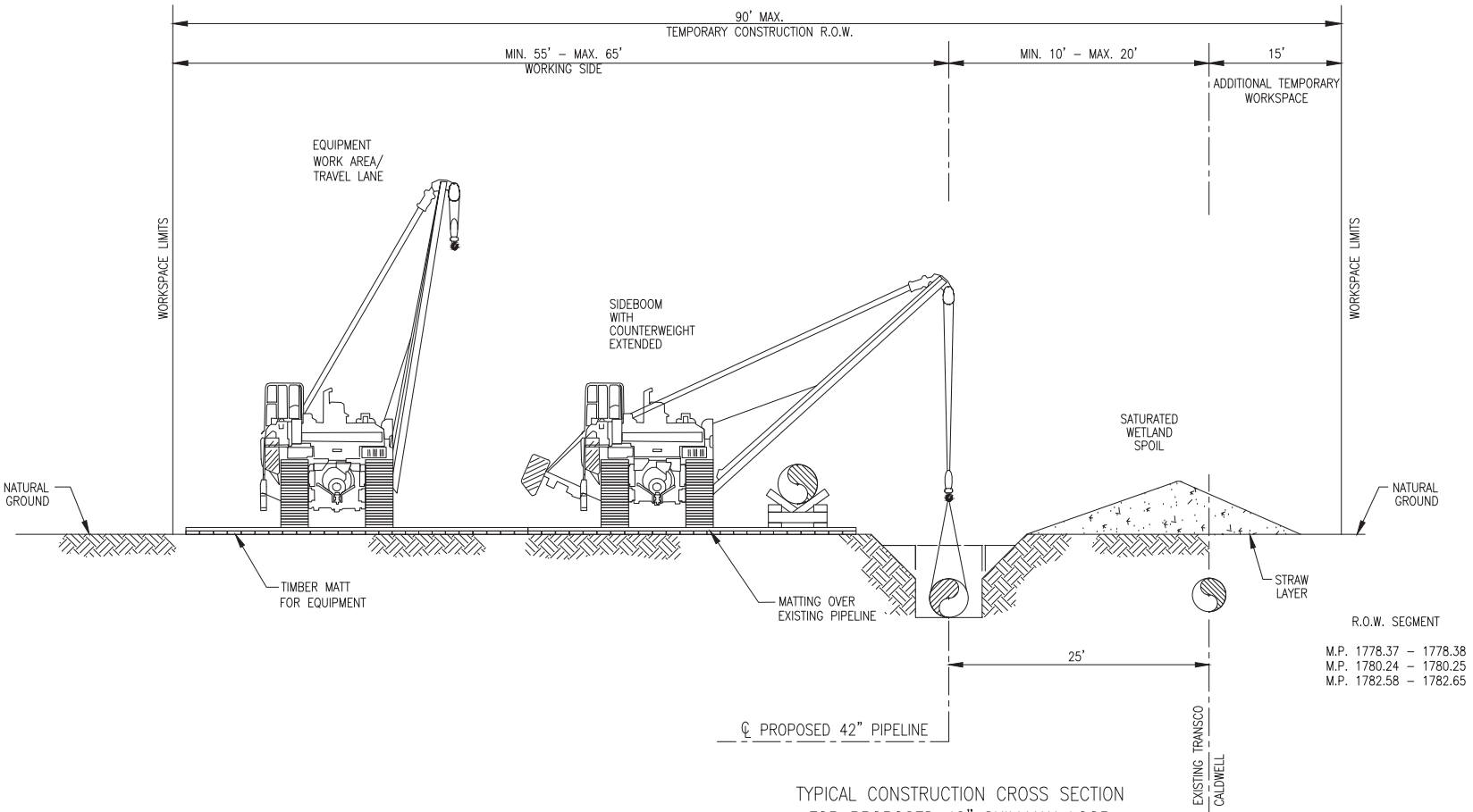
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-10	SHEET 1
W.O. 1129995		9:47am 9/17/2013 plgraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-10.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"
WITHIN SATURATED WETLAND AREAS

F-11

DRAWING NO.	REFERENCE TITLE

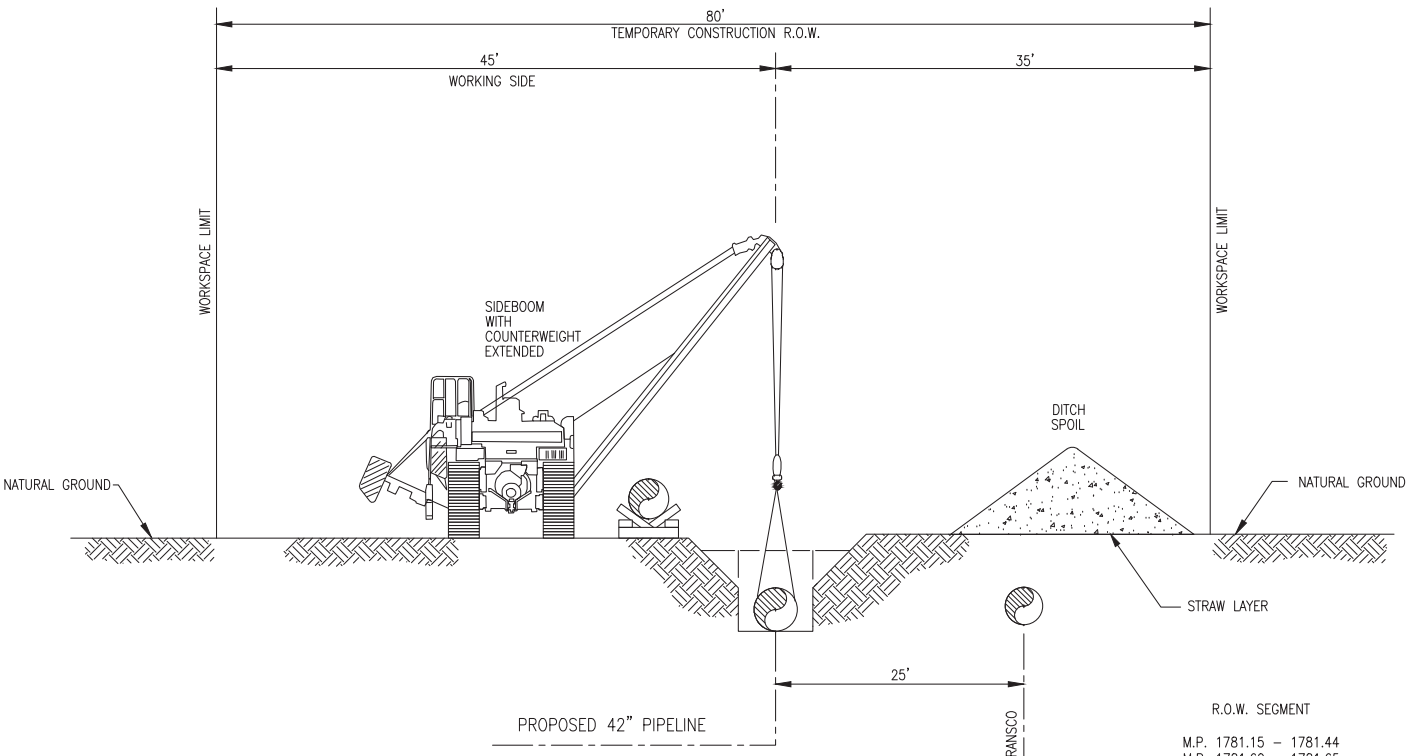
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

MUSTANG OF NEW JERSEY, INC.

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-11	SHEET 1
W.O. 1129995		9/17/2013 9:48am plgraci K:\20347 – Skillman Loop\Mapping\Typical\REVISION51 9-10-13\F-XS-S-11.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

R.O.W. SEGMENT

M.P. 1781.15 – 1781.44
M.P. 1781.60 – 1781.65
M.P. 1781.81 – 1782.01
M.P. 1782.05 – 1782.07
M.P. 1782.14 – 1782.17
M.P. 1782.22 – 1782.29
M.P. 1782.39 – 1782.46
M.P. 1782.47 – 1782.55

F-12

DRAWING NO.	REFERENCE TITLE

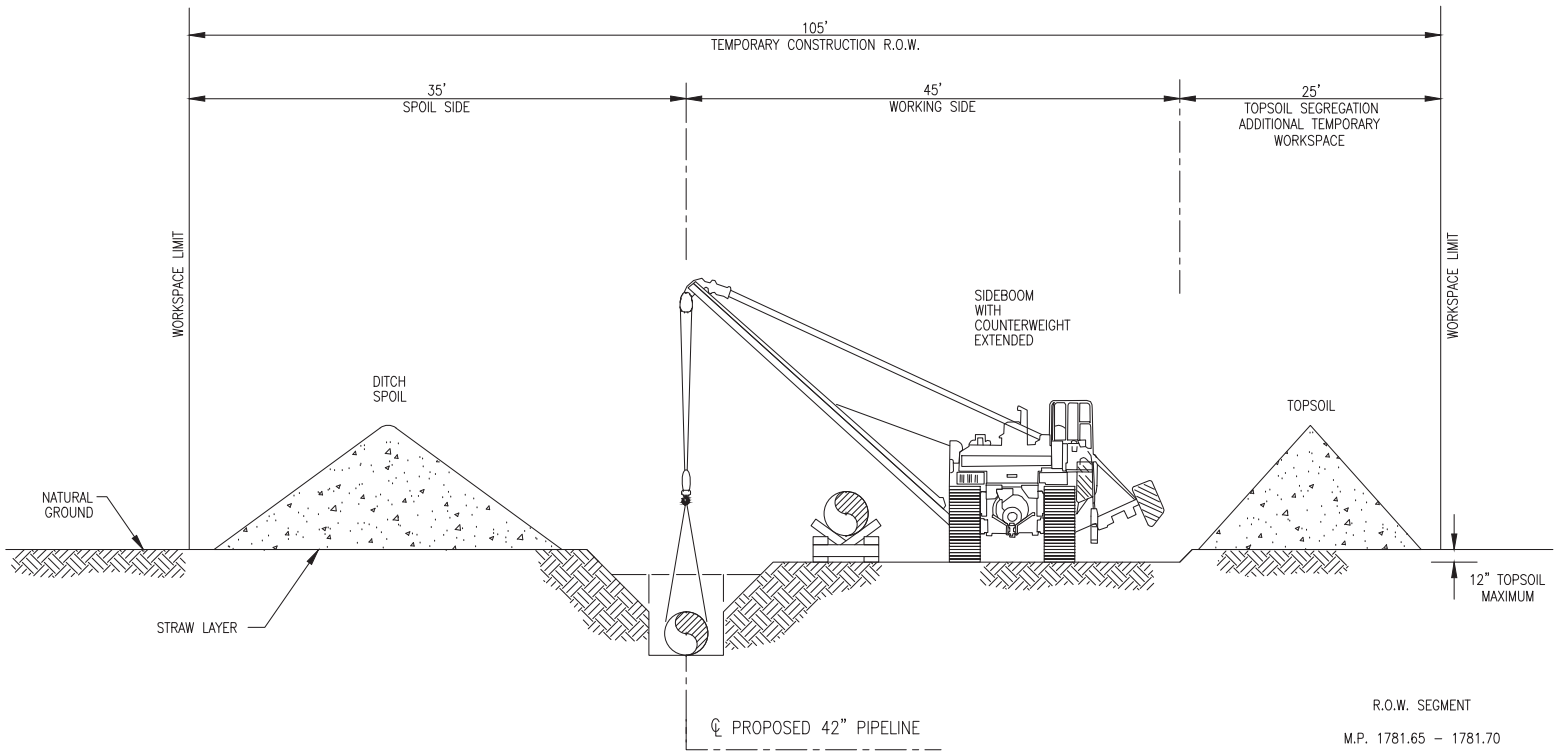
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

MUSTANG OF NEW JERSEY, INC.

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-12	SHEET 1
W.O. 1129995		9/17/2013 plgraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-12.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

F-13

DRAWING NO.	REFERENCE TITLE

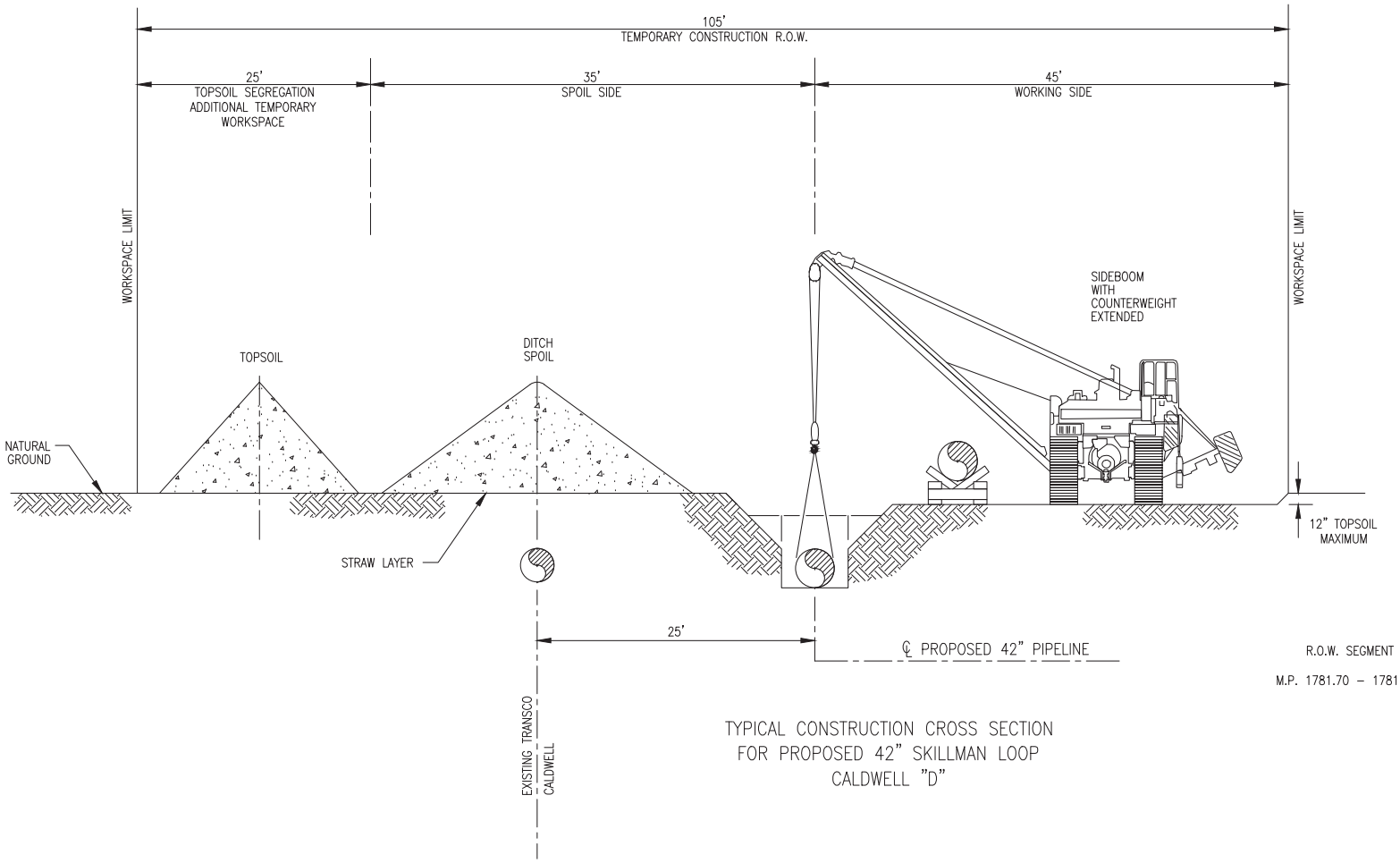
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

MUSTANG OF NEW JERSEY, INC.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-13	SHEET 1
W.O. 1129995		9:50am 9/17/2013 pigraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-13.dwg	OF 1



R.O.W. SEGMENT

M.P. 1781.70 – 1781.72

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

F-14

DRAWING NO.	REFERENCE TITLE

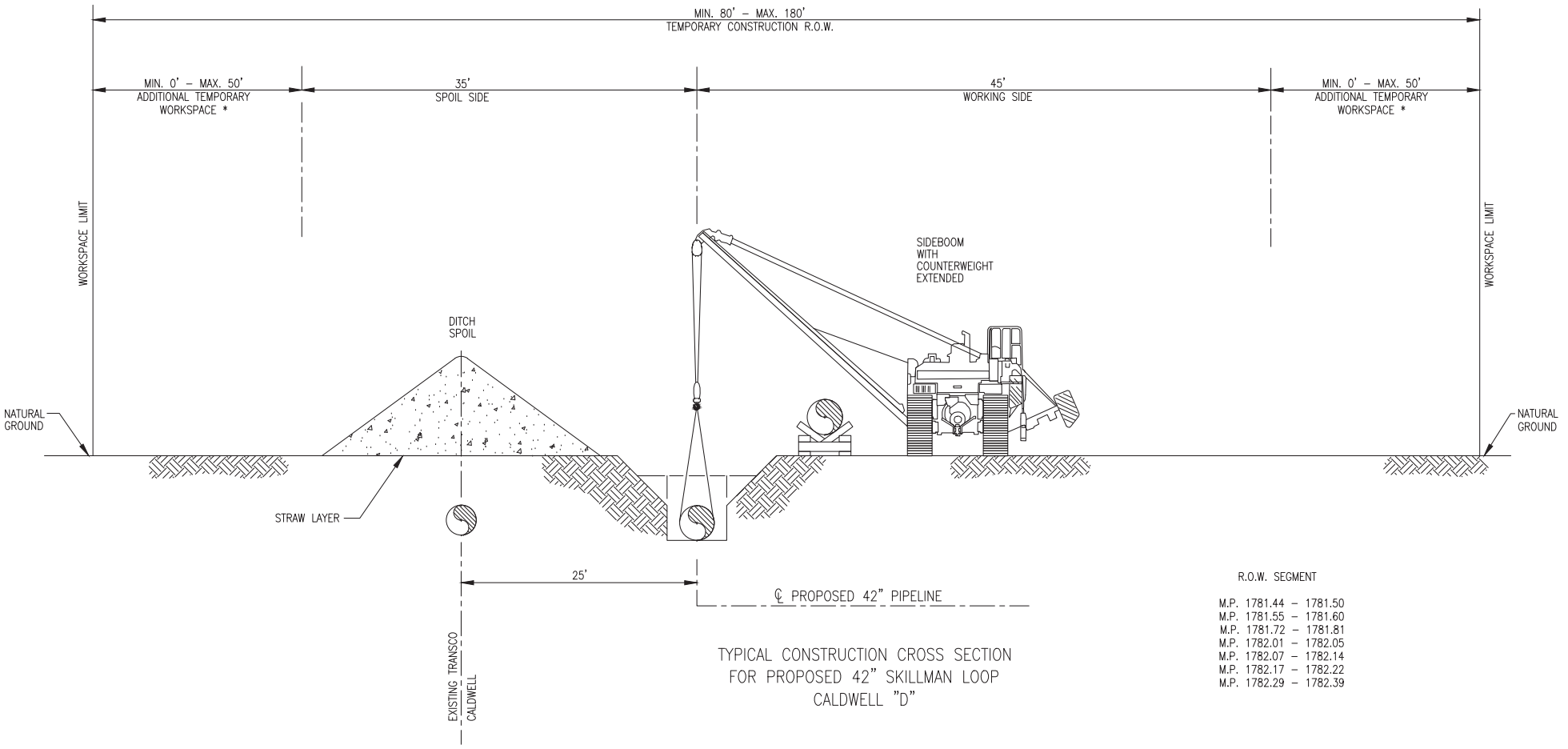
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

MUSTANG OF NEW JERSEY, INC.

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-14	SHEET 1
W.O. 1129995		9:50am 9/17/2013 pigraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-14.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" SKILLMAN LOOP
CALDWELL "D"

R.O.W. SEGMENT

M.P. 1781.44 – 1781.50
M.P. 1781.55 – 1781.60
M.P. 1781.72 – 1781.81
M.P. 1782.01 – 1782.05
M.P. 1782.07 – 1782.14
M.P. 1782.17 – 1782.22
M.P. 1782.29 – 1782.39

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

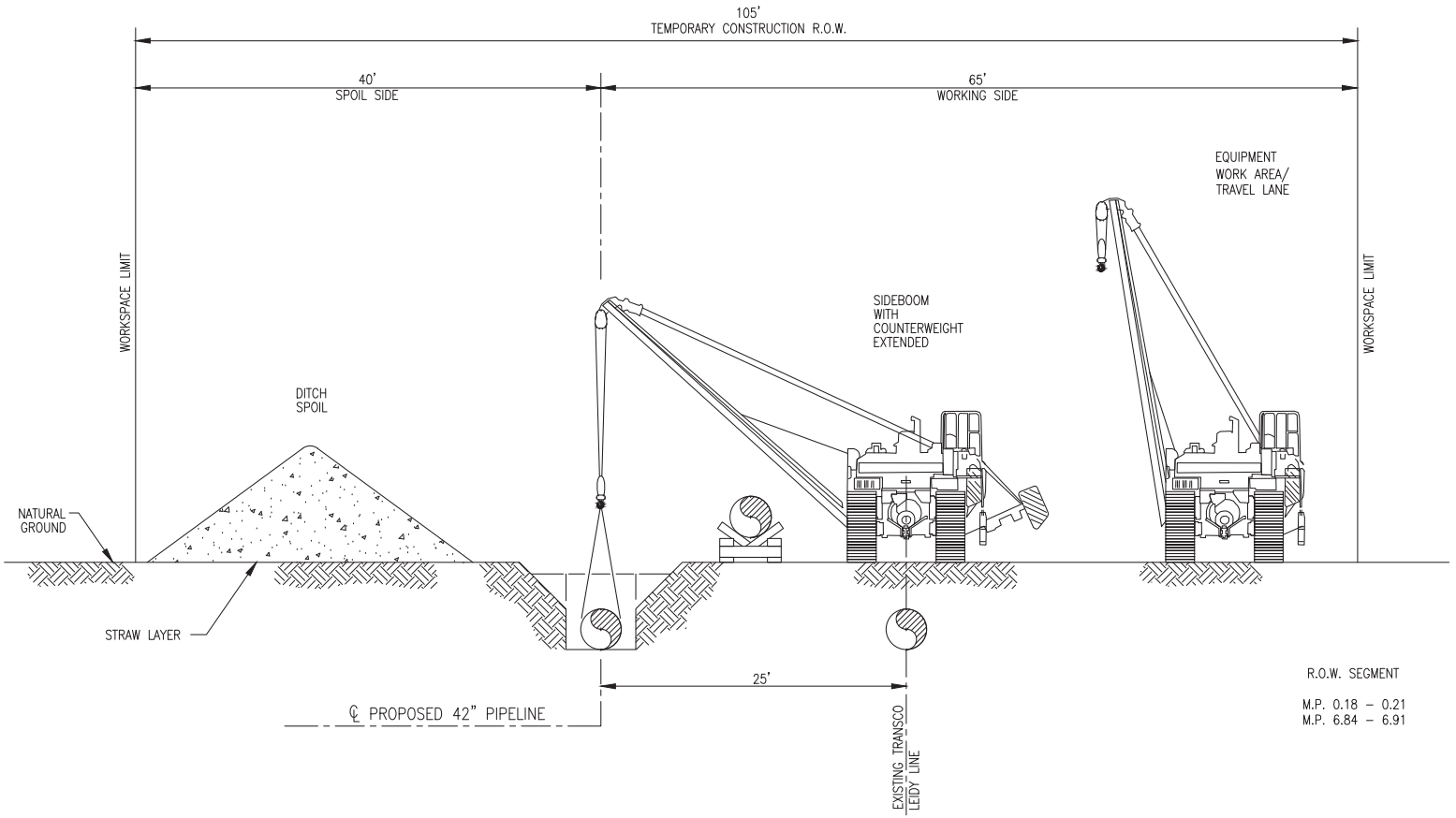
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PIPELINE SKILLMAN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MERCER & SOMERSET COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129995	JD	MJH
1	9/3/2013	PG	ISSUED FOR FINAL REVIEW	1129995	JD	MJH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129995	JD	MJH

MUSTANG OF NEW JERSEY, INC.

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MJH	DATE: 9/18/13	DRAWING NUMBER: F-XS-S-15	SHEET 1
W.O. 1129995		9/17/2013 9:51am plgraci K:\20347 – Skillman Loop\Mapping\Typical\REVISIONS1 9-10-13\F-XS-S-15.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" PLEASANT RUN LOOP
LIEDY LINE "C"

DRAWING NO.	REFERENCE TITLE

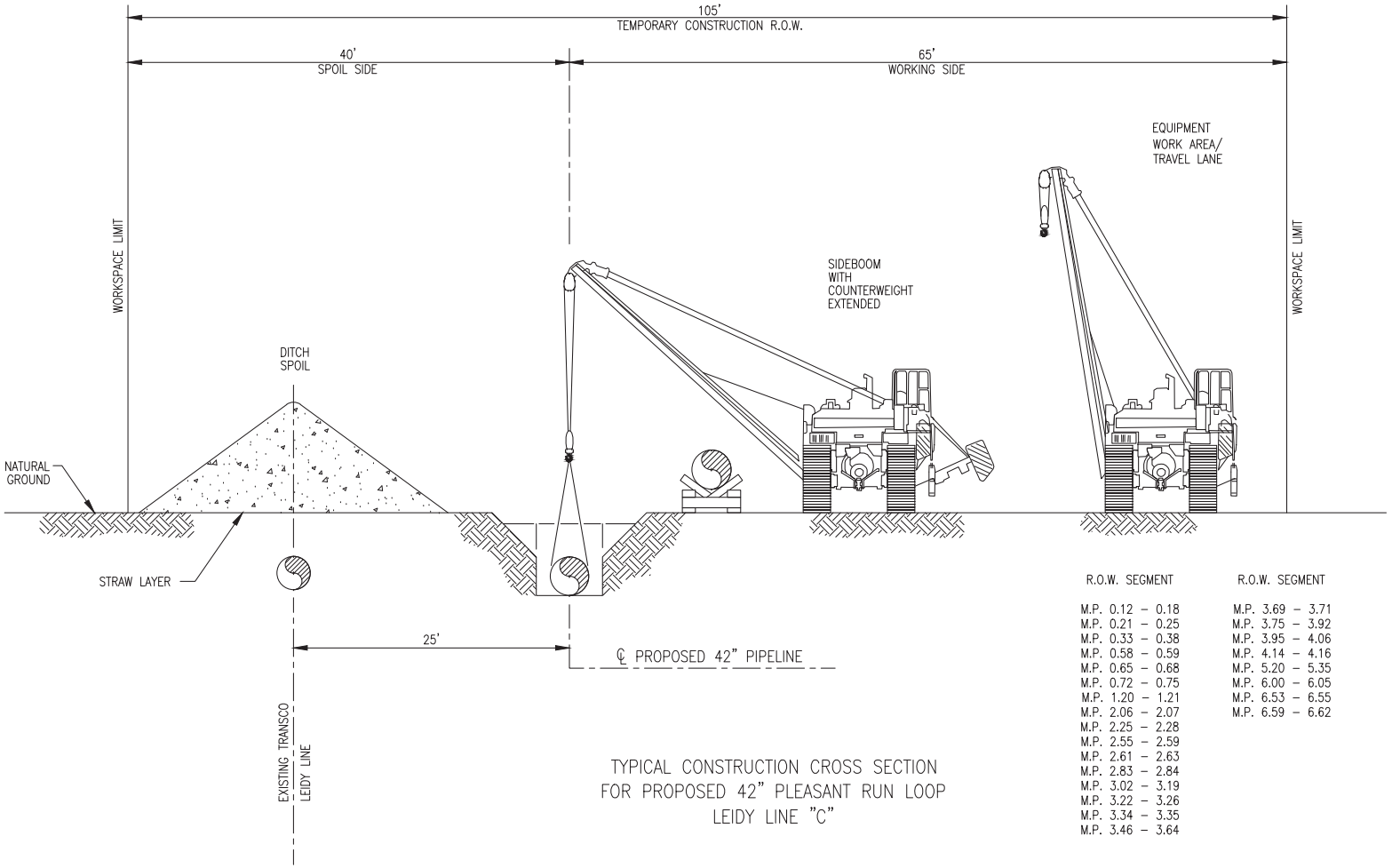
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERDON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

MUSTANG OF NEW JERSEY, INC

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129993	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129993	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129993	JD	MH

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-1	SHEET 1
W.O. 1129993		9/18/2013 1:35pm pfgraci K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-1.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" PLEASANT RUN LOOP
LEIDY LINE "C"

R.O.W. SEGMENT	R.O.W. SEGMENT
M.P. 0.12 – 0.18	M.P. 3.69 – 3.71
M.P. 0.21 – 0.25	M.P. 3.75 – 3.92
M.P. 0.33 – 0.38	M.P. 3.95 – 4.06
M.P. 0.58 – 0.59	M.P. 4.14 – 4.16
M.P. 0.65 – 0.68	M.P. 5.20 – 5.35
M.P. 0.72 – 0.75	M.P. 6.00 – 6.05
M.P. 1.20 – 1.21	M.P. 6.53 – 6.55
M.P. 2.06 – 2.07	M.P. 6.59 – 6.62
M.P. 2.25 – 2.28	
M.P. 2.55 – 2.59	
M.P. 2.61 – 2.63	
M.P. 2.83 – 2.84	
M.P. 3.02 – 3.19	
M.P. 3.22 – 3.26	
M.P. 3.34 – 3.35	
M.P. 3.46 – 3.64	

F-17

MUSTANG OF NEW JERSEY, INC.

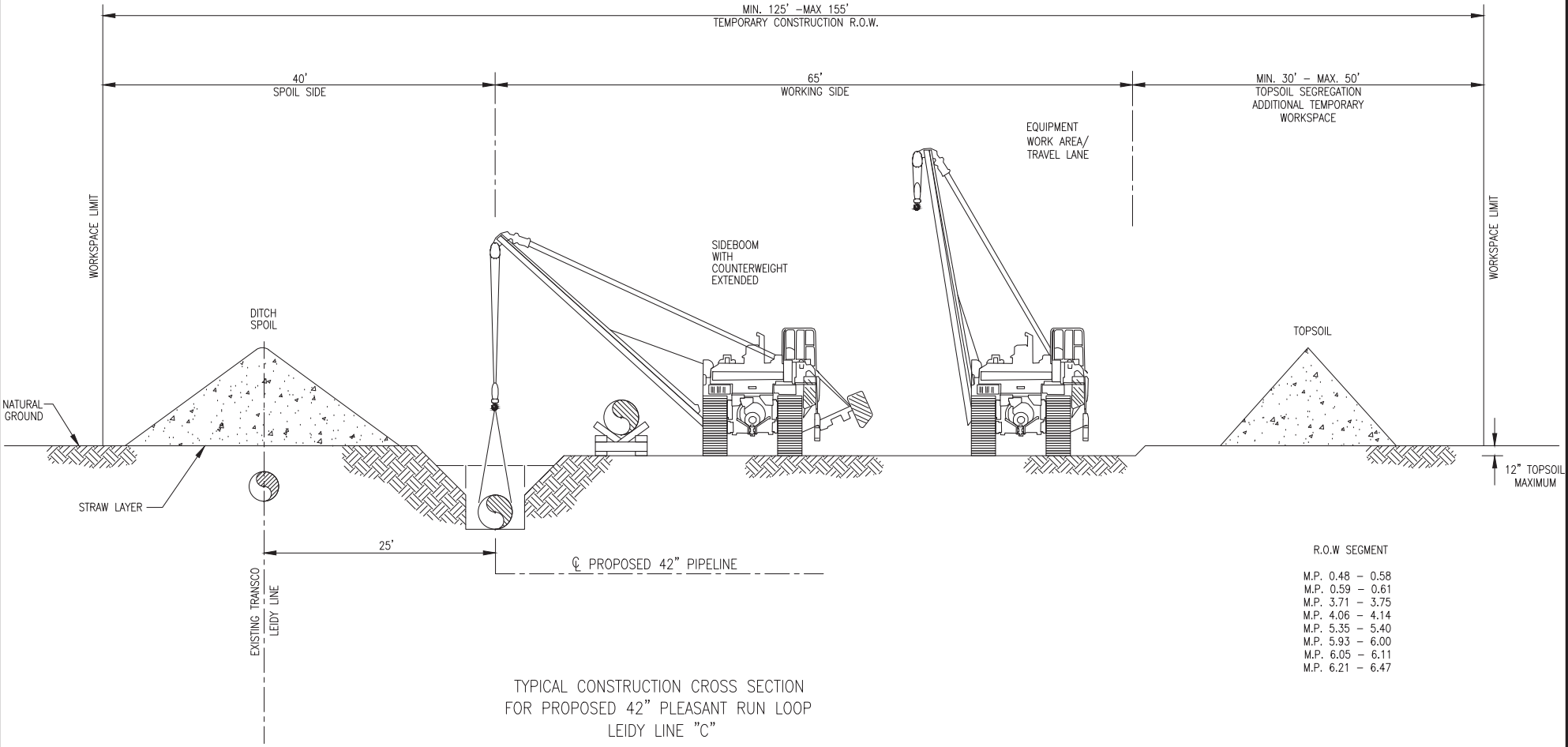
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERDON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129993	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129993	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129993	JD	MH

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-2	SHEET 1
W.O. 1129993		9/16/2013 1:38pm pigraci K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-2.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" PLEASANT RUN LOOP
LEIDY LINE "C"

R.O.W SEGMENT

M.P. 0.48 – 0.58
M.P. 0.59 – 0.61
M.P. 3.71 – 3.75
M.P. 4.06 – 4.14
M.P. 5.35 – 5.40
M.P. 5.93 – 6.00
M.P. 6.05 – 6.11
M.P. 6.21 – 6.47

F-18

DRAWING NO.	REFERENCE TITLE

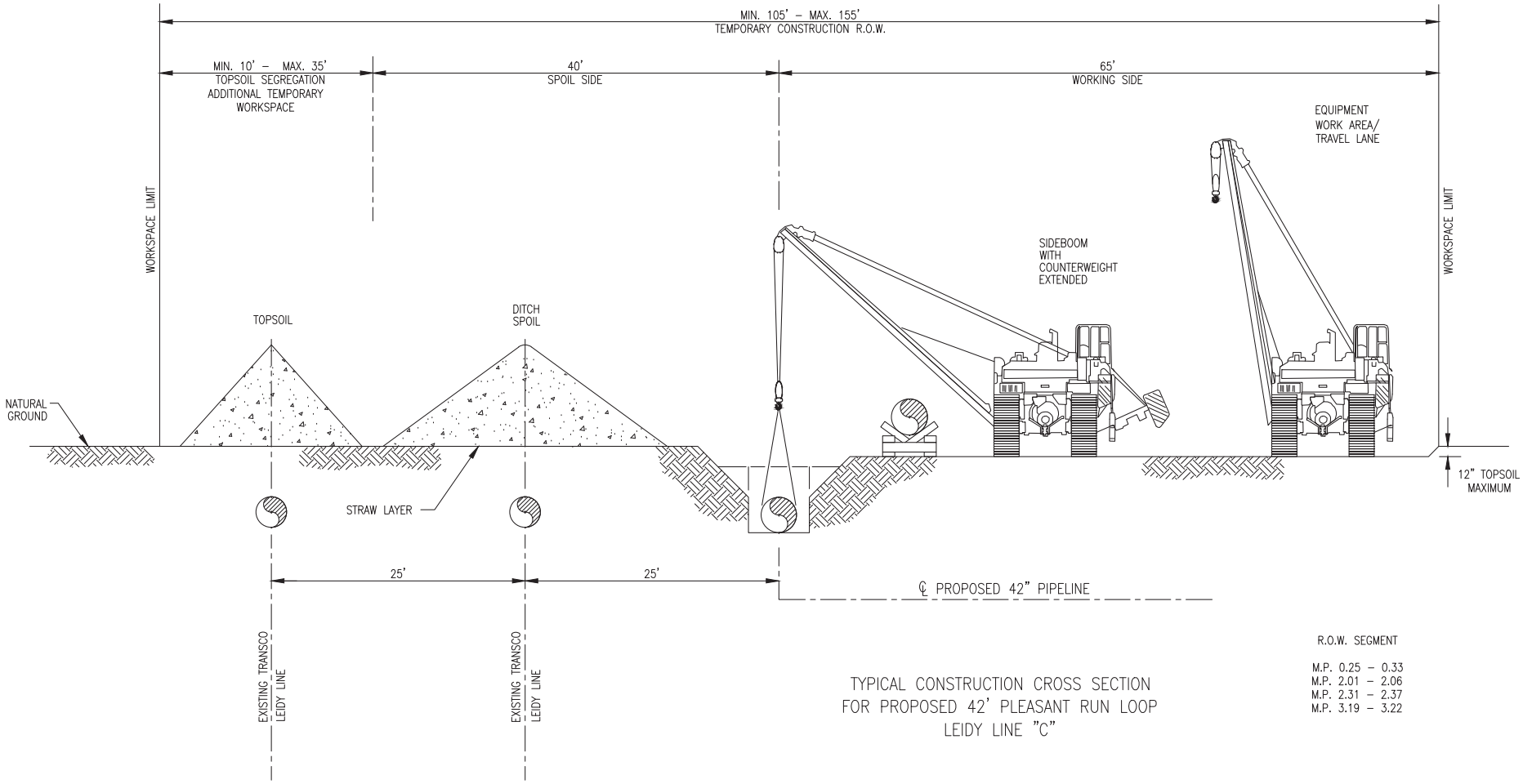
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERDON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

MUSTANG OF NEW JERSEY, INC

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/10/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-3	SHEET 1
W.O. 1129993		1=43pm 9/18/2013 plgraci K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-3.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42' PLEASANT RUN LOOP
LEIDY LINE "C"

R.O.W. SEGMENT

M.P. 0.25 – 0.33
M.P. 2.01 – 2.06
M.P. 2.31 – 2.37
M.P. 3.19 – 3.22

F-19

DRAWING NO.	REFERENCE TITLE

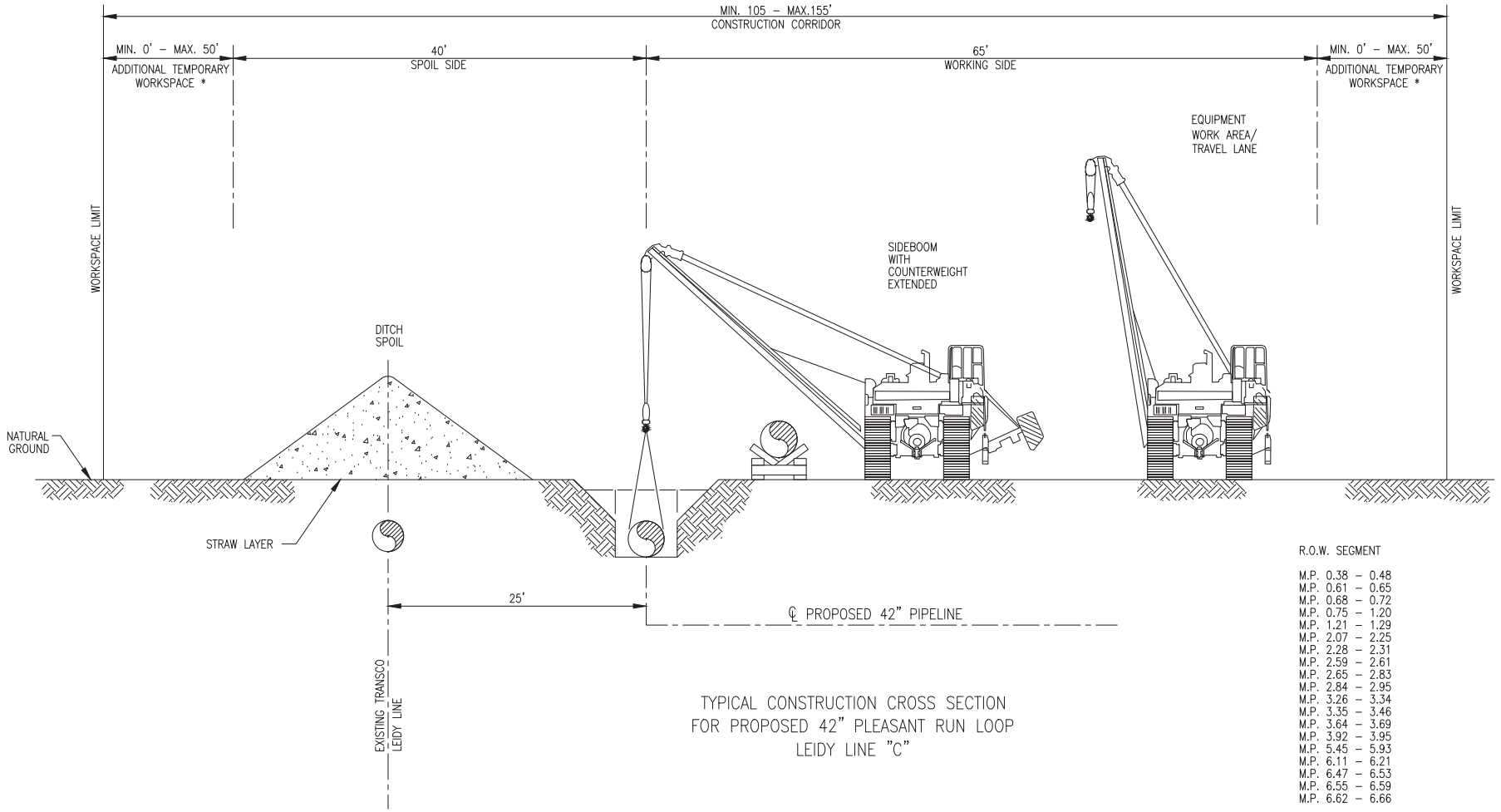
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERDON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129993	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129993	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129993	JD	MH

MUSTANG OF NEW JERSEY, INC

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-4	SHEET 1 OF 1
WO: 1129993		1:50pm 9/16/2013 pigraci K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-4.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" PLEASANT RUN LOOP
LEIDY LINE "C"

R.O.W. SEGMENT

M.P. 0.38 – 0.48
M.P. 0.61 – 0.65
M.P. 0.68 – 0.72
M.P. 0.75 – 1.20
M.P. 1.21 – 1.29
M.P. 2.07 – 2.25
M.P. 2.28 – 2.31
M.P. 2.59 – 2.61
M.P. 2.65 – 2.83
M.P. 2.84 – 2.95
M.P. 3.26 – 3.34
M.P. 3.35 – 3.46
M.P. 3.64 – 3.69
M.P. 3.92 – 3.95
M.P. 5.45 – 5.93
M.P. 6.11 – 6.21
M.P. 6.47 – 6.53
M.P. 6.55 – 6.59
M.P. 6.62 – 6.66

F-20

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

MUSTANG OF NEW JERSEY, INC

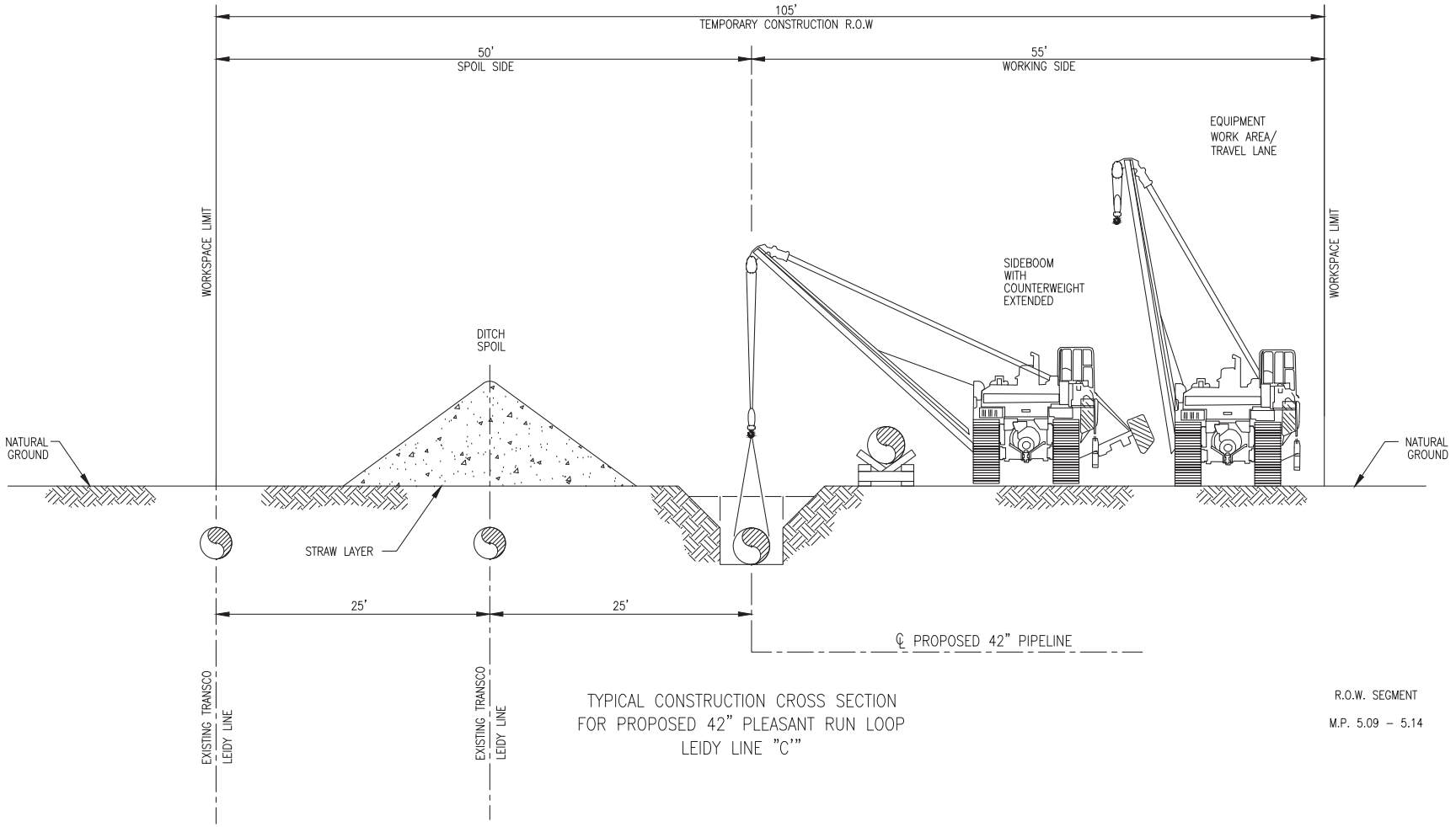
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERDON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-5	SHEET 1 OF 1
W.O: 1129991		2:1bm 9/16/2013 p1graci K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-5.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" PLEASANT RUN LOOP
LEIDY LINE "C'"

R.O.W. SEGMENT

M.P. 5.09 – 5.14

F-21

DRAWING NO.	REFERENCE TITLE

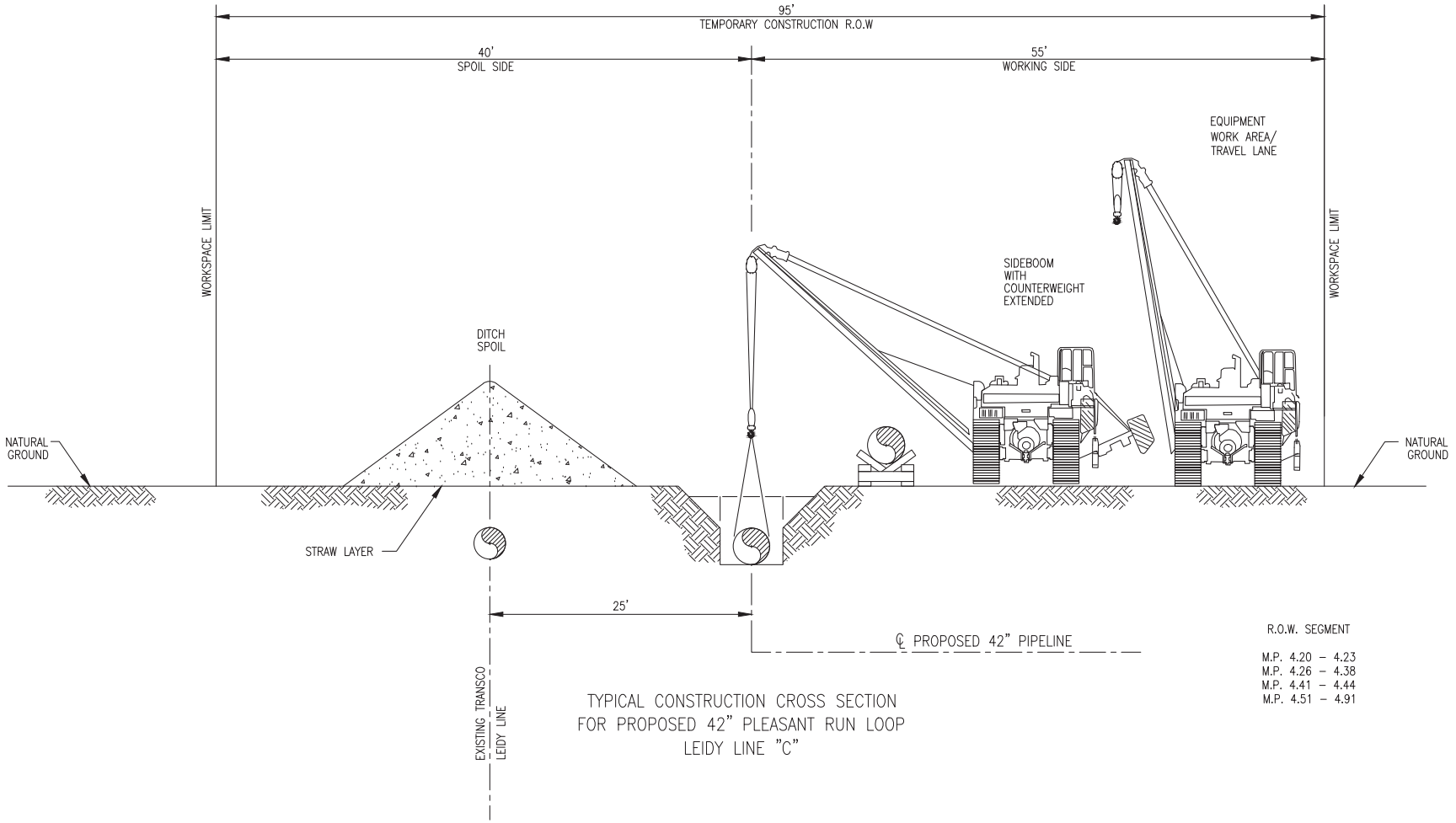
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERSON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

MUSTANG OF NEW JERSEY, INC

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-6	SHEET 1 OF 1
WO: 1129991		2:16pm 9/16/2013 pigraci K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-6.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" PLEASANT RUN LOOP
LEIDY LINE "C"

R.O.W. SEGMENT

M.P. 4.20 – 4.23
M.P. 4.26 – 4.38
M.P. 4.41 – 4.44
M.P. 4.51 – 4.91

F-22

DRAWING NO.	REFERENCE TITLE

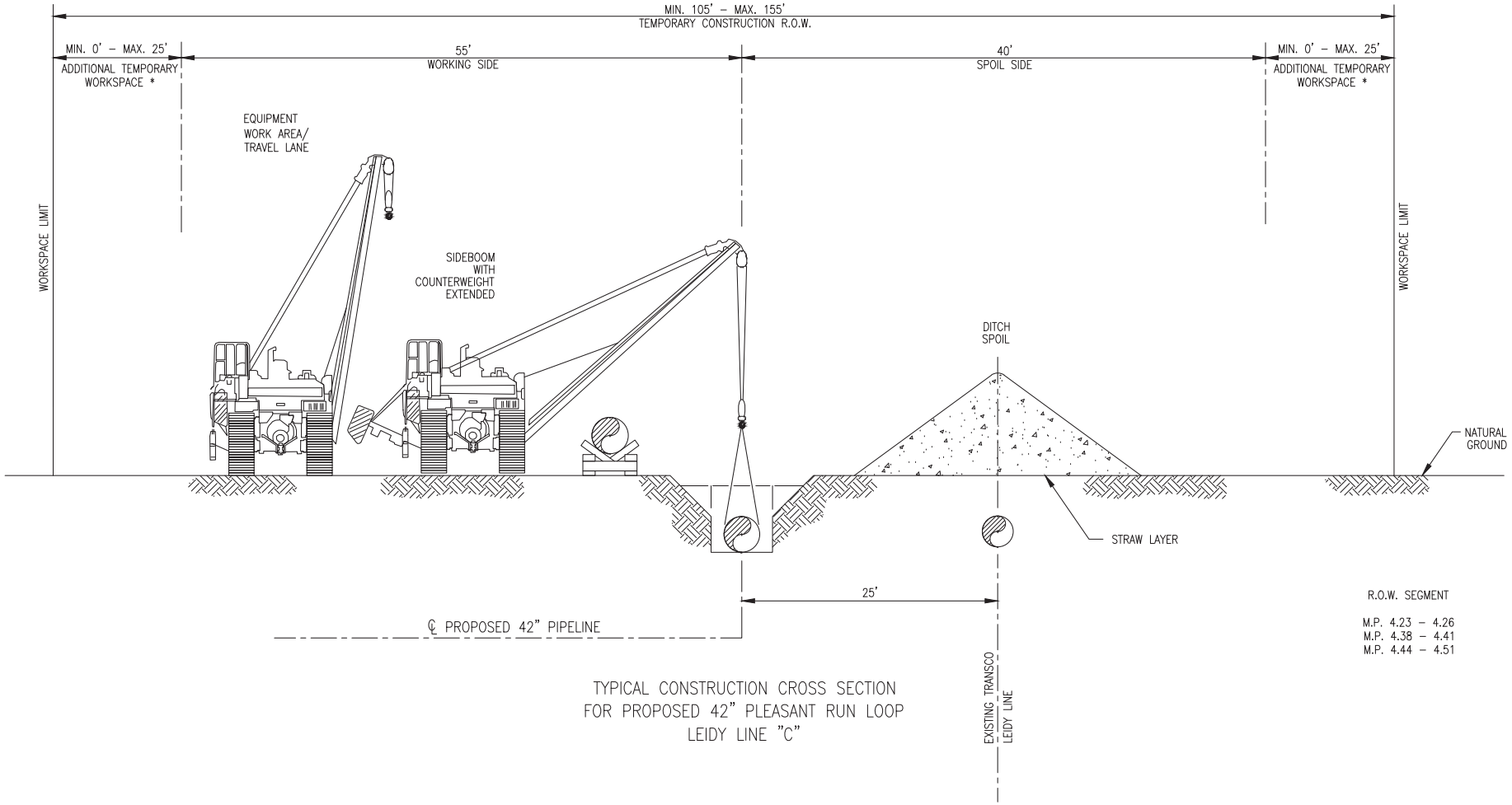
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERSON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

MUSTANG OF NEW JERSEY, INC

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
1	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-8	SHEET 1
WO: 1129991		2:22pm 9/16/2013 p:\gracl K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-8.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" PLEASANT RUN LOOP
LEIDY LINE "C"

R.O.W. SEGMENT

M.P. 4.23 – 4.26
M.P. 4.38 – 4.41
M.P. 4.44 – 4.51

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

MUSTANG OF NEW JERSEY, INC

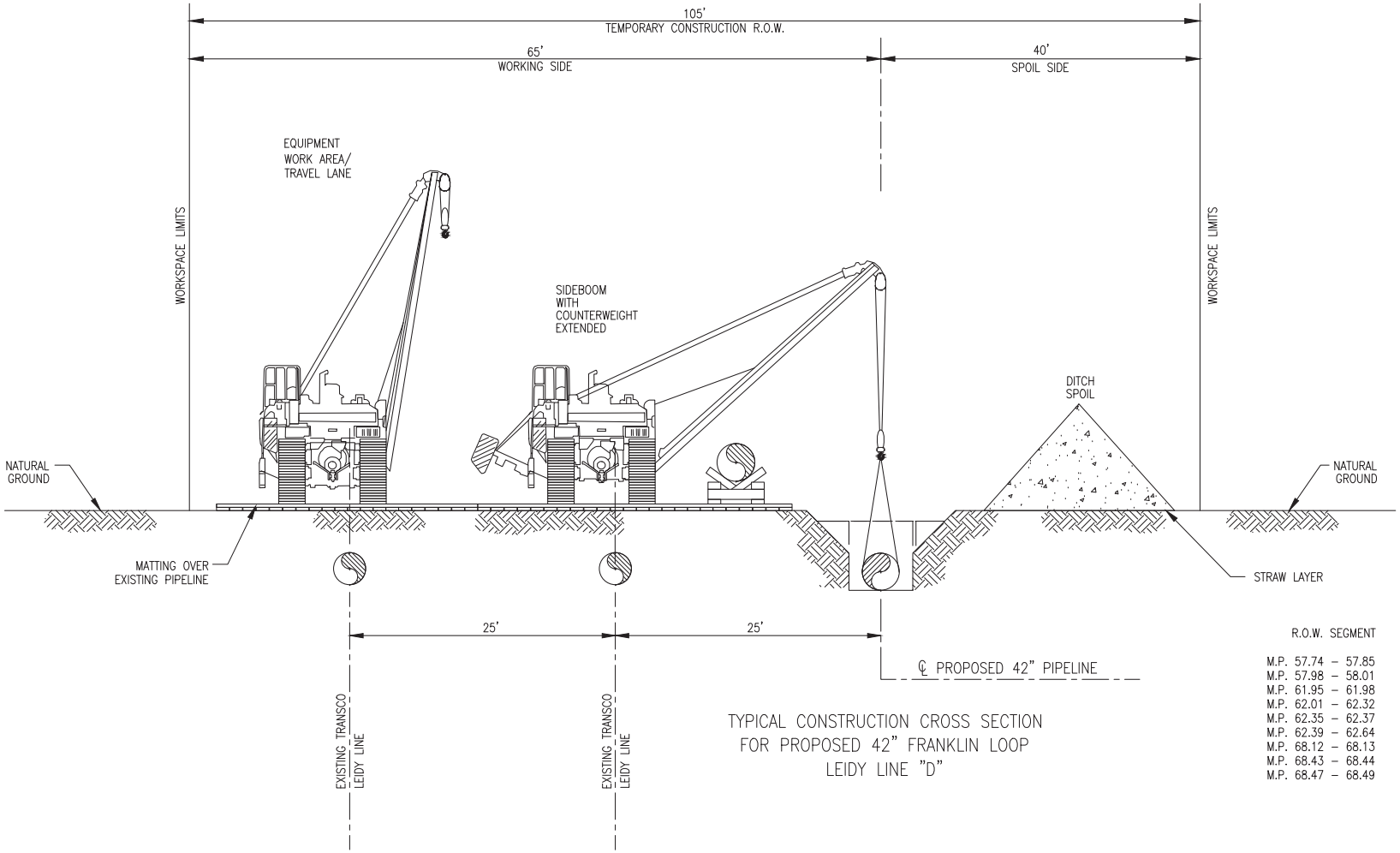
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" PLEASANT RUN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
SOMERSET & HUNTERDON COUNTIES, NEW JERSEY

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/2/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-P-9	SHEET 1
W.O. 1129991		2:34pm 9/18/2013 pigraci K:\20346 – Pleasant Run Loop\Mapping\Typical\REVISIONS 8-27-13\F-XS-P-9.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 57.74 – 57.85
M.P. 57.98 – 58.01
M.P. 61.95 – 61.98
M.P. 62.01 – 62.32
M.P. 62.35 – 62.37
M.P. 62.39 – 62.64
M.P. 68.12 – 68.13
M.P. 68.43 – 68.44
M.P. 68.47 – 68.49

F-24

DRAWING NO.	REFERENCE TITLE

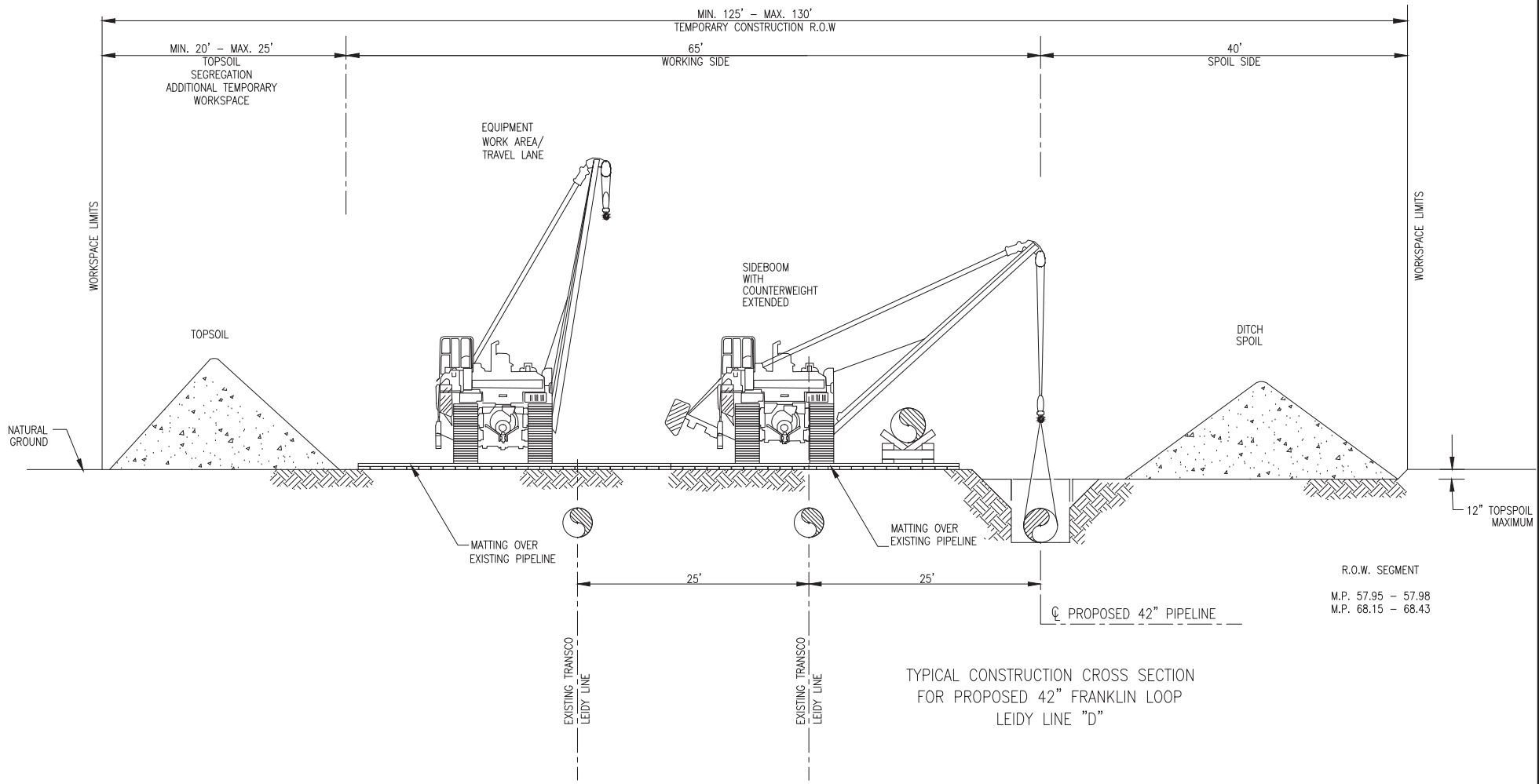
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANIA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-F-1	SHEET 1 OF 1
WO: 1129991		9/16/2013 9:54am p1grasi K:\20345 –Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-1.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

F-25

DRAWING NO.	REFERENCE TITLE

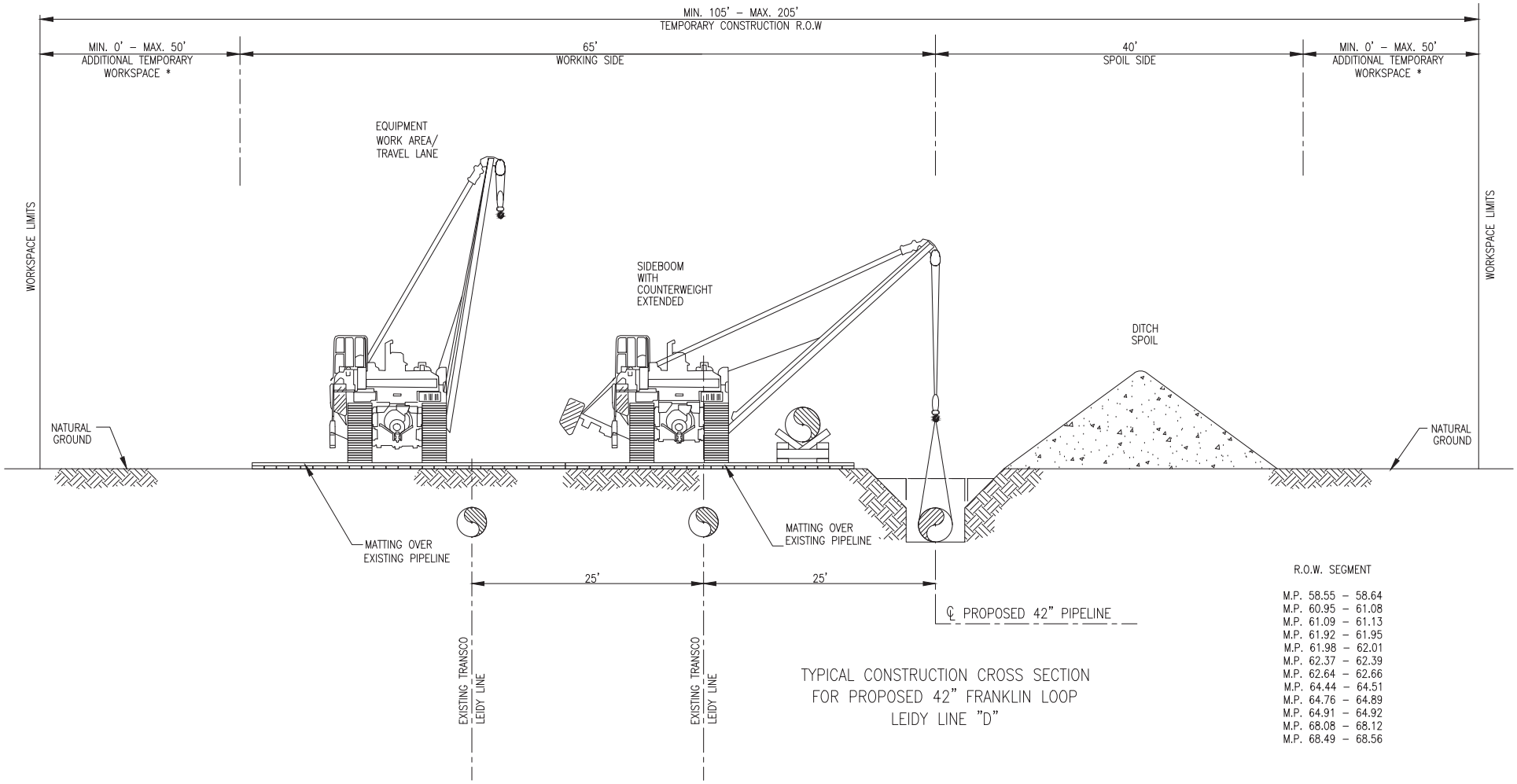
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANNA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JB	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-F-2	SHEET 1 OF 1
W.O: 1129991		10:02am 9/18/2013 plgraci K:\20345 –Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-2.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 58.55 – 58.64
M.P. 60.95 – 61.08
M.P. 61.09 – 61.13
M.P. 61.92 – 61.95
M.P. 61.98 – 62.01
M.P. 62.37 – 62.39
M.P. 62.64 – 62.66
M.P. 64.44 – 64.51
M.P. 64.76 – 64.89
M.P. 64.91 – 64.92
M.P. 68.08 – 68.12
M.P. 68.49 – 68.56

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

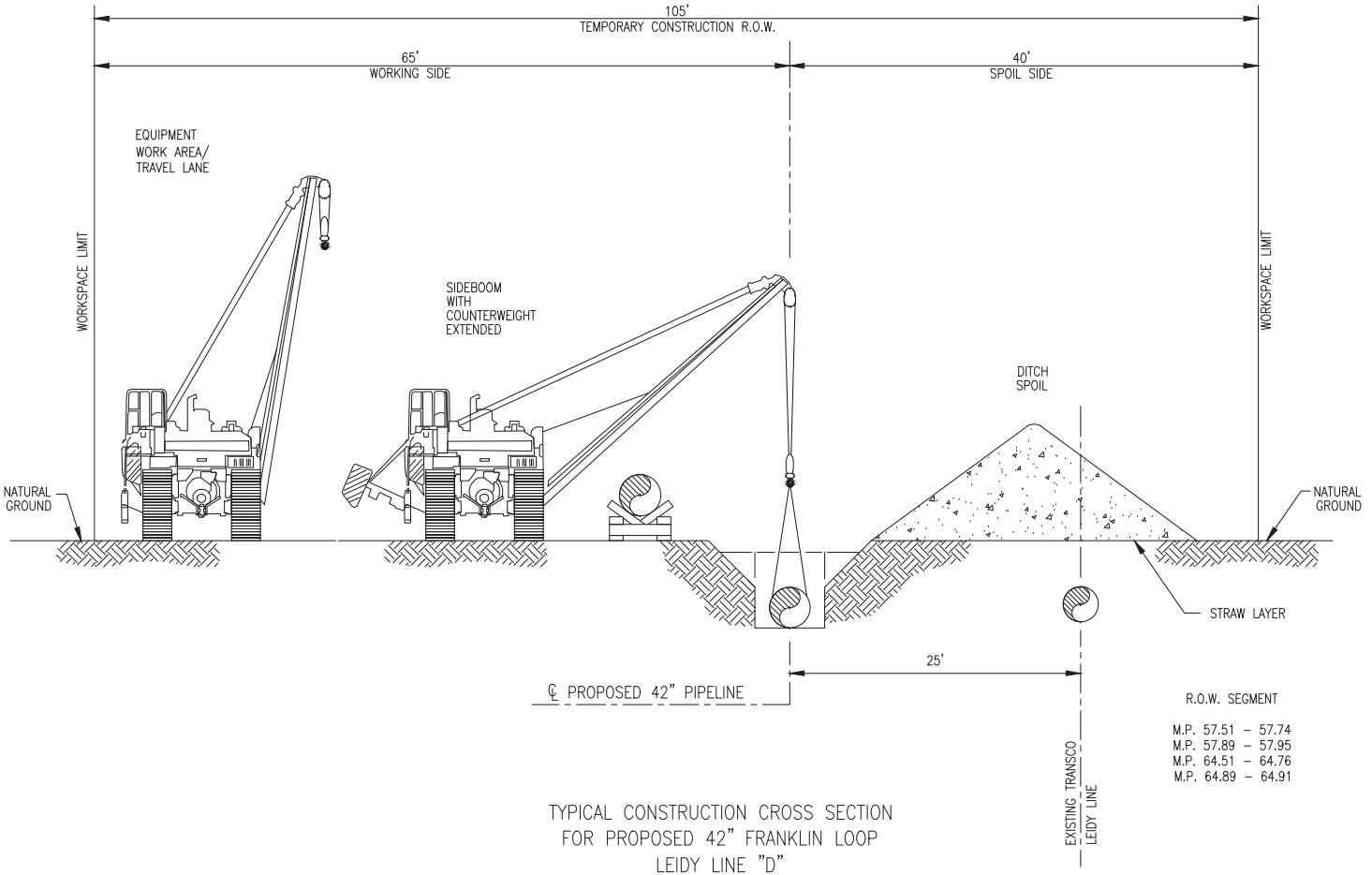
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANNA

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

Wood Group Mustang, Inc.

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JB	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/1913	DRAWING NUMBER: F-XS-F-3	SHEET 1 OF 1
WO: 1129991		10:15am 9/16/2013 p:\gracl K:\20345 –Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-3.dwg	



R.O.W. SEGMENT

M.P. 57.51 – 57.74
M.P. 57.89 – 57.95
M.P. 64.51 – 64.76
M.P. 64.89 – 64.91

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

F-27

DRAWING NO.	REFERENCE TITLE

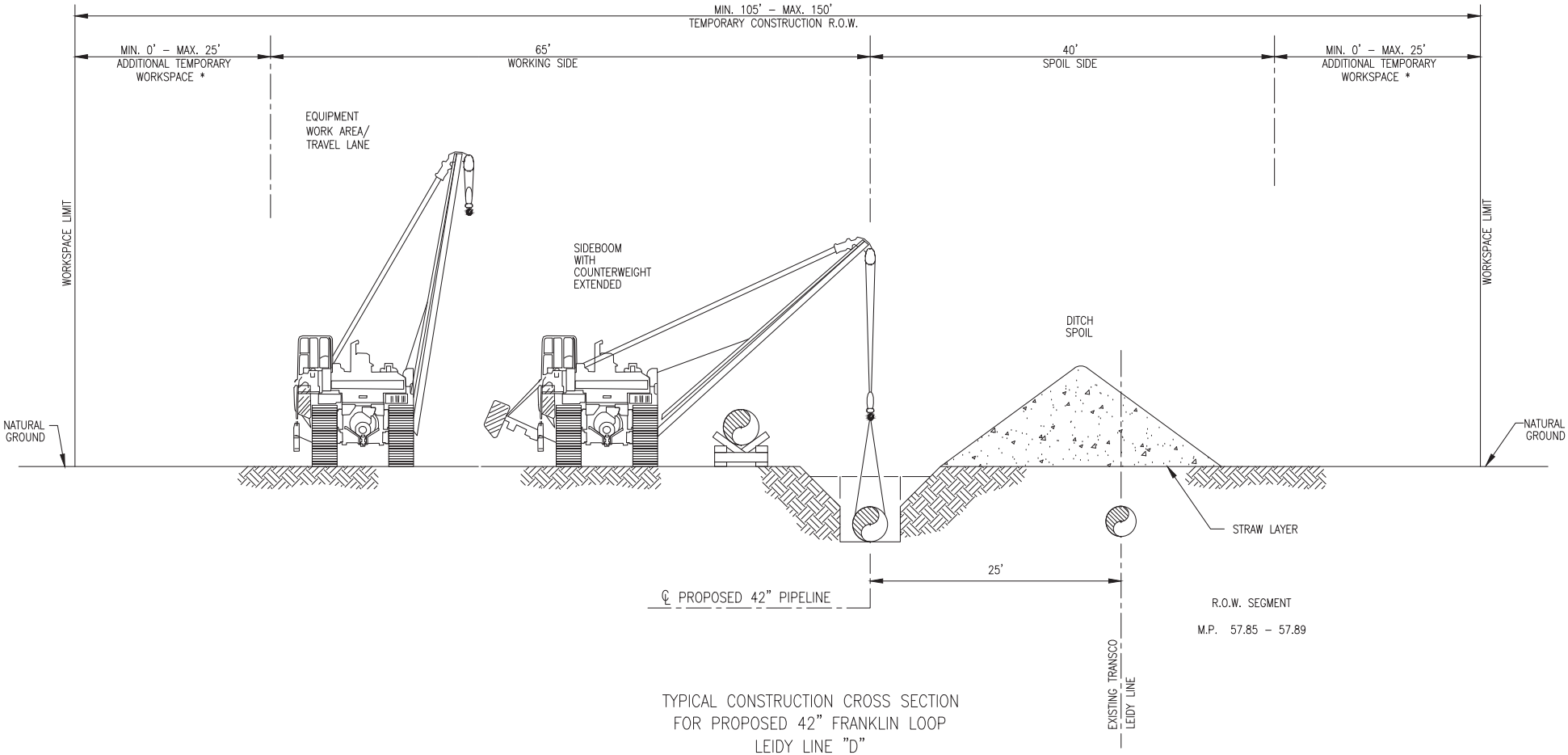
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANIA

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

Wood Group Mustang, Inc.

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-F-4	SHEET 1
W.O. 1129991		10:23am 9/18/2013 pigraci K:\20345 –Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-4.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

Wood Group Mustang, Inc.

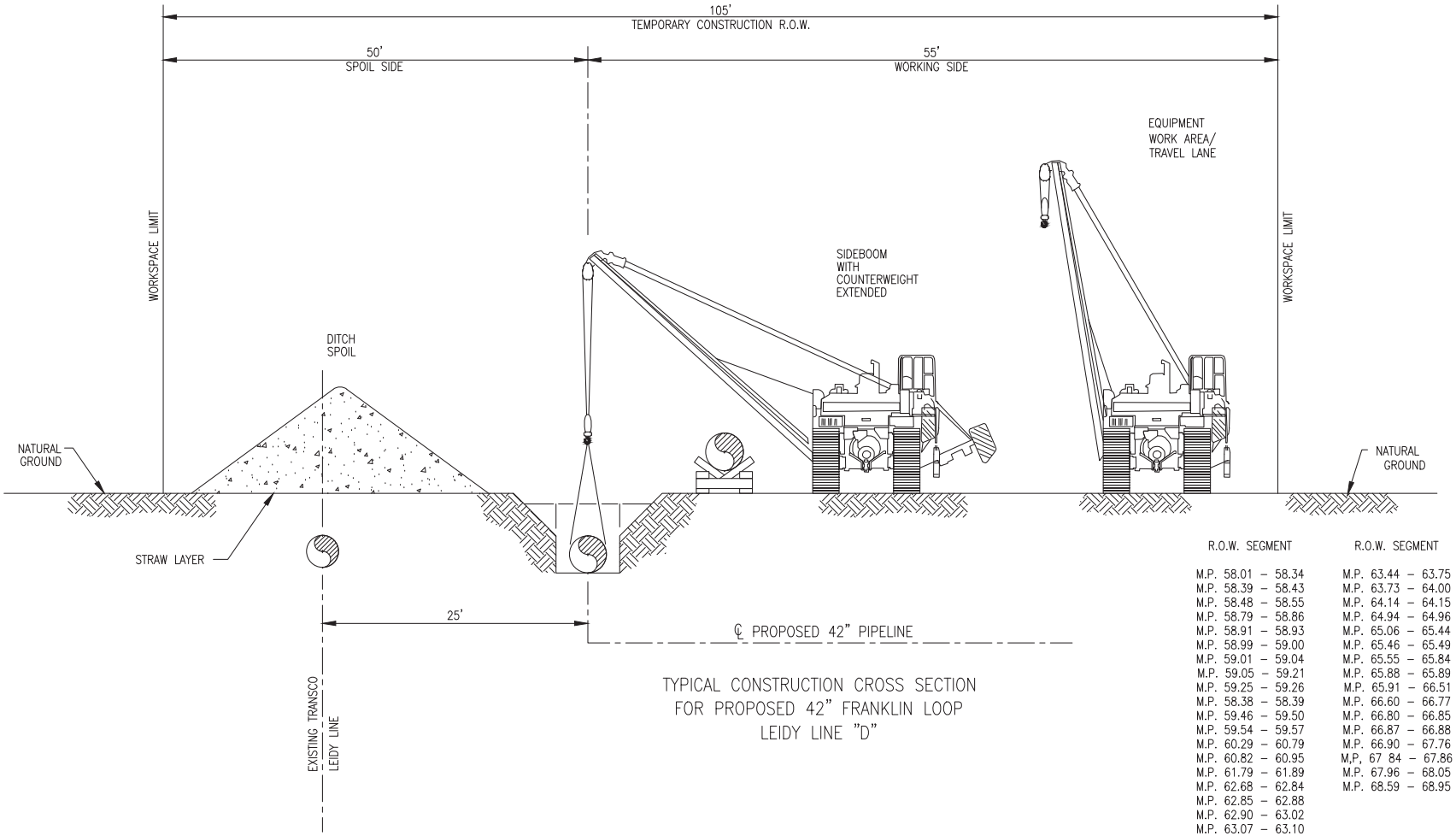
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANIA

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-F-5	SHEET 1 OF 1
WO: 1129991		10:30am 9/16/2013 pigraci K:\20345 –Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-5.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

R.O.W. SEGMENT	R.O.W. SEGMENT
M.P. 58.01 – 58.34	M.P. 63.44 – 63.75
M.P. 58.39 – 58.43	M.P. 63.73 – 64.00
M.P. 58.48 – 58.55	M.P. 64.14 – 64.15
M.P. 58.79 – 58.86	M.P. 64.94 – 64.96
M.P. 58.91 – 58.93	M.P. 65.06 – 65.44
M.P. 58.99 – 59.00	M.P. 65.46 – 65.49
M.P. 59.01 – 59.04	M.P. 65.55 – 65.84
M.P. 59.05 – 59.21	M.P. 65.88 – 65.89
M.P. 59.25 – 59.26	M.P. 65.91 – 66.51
M.P. 58.38 – 58.39	M.P. 66.60 – 66.77
M.P. 59.46 – 59.50	M.P. 66.80 – 66.85
M.P. 59.54 – 59.57	M.P. 66.87 – 66.88
M.P. 60.29 – 60.79	M.P. 66.90 – 67.76
M.P. 60.82 – 60.95	M,P, 67 84 – 67.86
M.P. 61.79 – 61.89	M.P. 67.96 – 68.05
M.P. 62.68 – 62.84	M.P. 68.59 – 68.95
M.P. 62.85 – 62.88	
M.P. 62.90 – 63.02	
M.P. 63.07 – 63.10	
M.P. 63.16 – 63.18	
M.P. 63.23 – 63.43	

F-29

Wood Group Mustang, Inc.

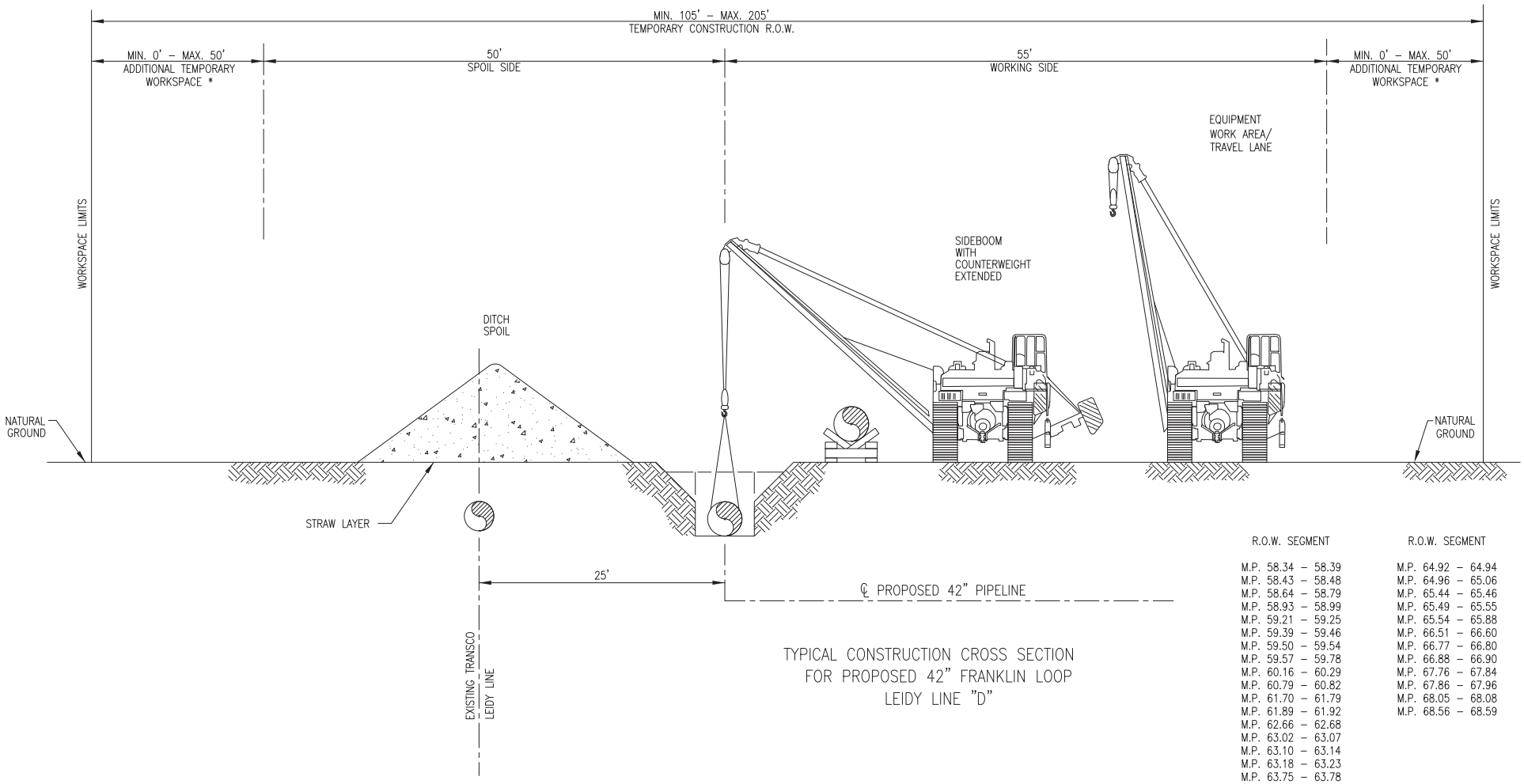
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANIA

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-F-6	SHEET 1
W.O: 1129991		9/18/2013 10:35am pigraci K:\20345 --Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-6.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

R.O.W. SEGMENT	R.O.W. SEGMENT
M.P. 58.34 – 58.39	M.P. 64.92 – 64.94
M.P. 58.43 – 58.48	M.P. 64.96 – 65.06
M.P. 58.64 – 58.79	M.P. 65.44 – 65.46
M.P. 58.93 – 58.99	M.P. 65.49 – 65.55
M.P. 59.21 – 59.25	M.P. 65.54 – 65.88
M.P. 59.39 – 59.46	M.P. 66.51 – 66.60
M.P. 59.50 – 59.54	M.P. 66.77 – 66.80
M.P. 59.57 – 59.78	M.P. 66.88 – 66.90
M.P. 60.16 – 60.29	M.P. 67.76 – 67.84
M.P. 60.79 – 60.82	M.P. 67.86 – 67.96
M.P. 61.70 – 61.79	M.P. 68.05 – 68.08
M.P. 61.89 – 61.92	M.P. 68.56 – 68.59
M.P. 62.66 – 62.68	
M.P. 63.02 – 63.07	
M.P. 63.10 – 63.14	
M.P. 63.18 – 63.23	
M.P. 63.75 – 63.78	
M.P. 64.00 – 64.14	

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

Wood Group Mustang, Inc.

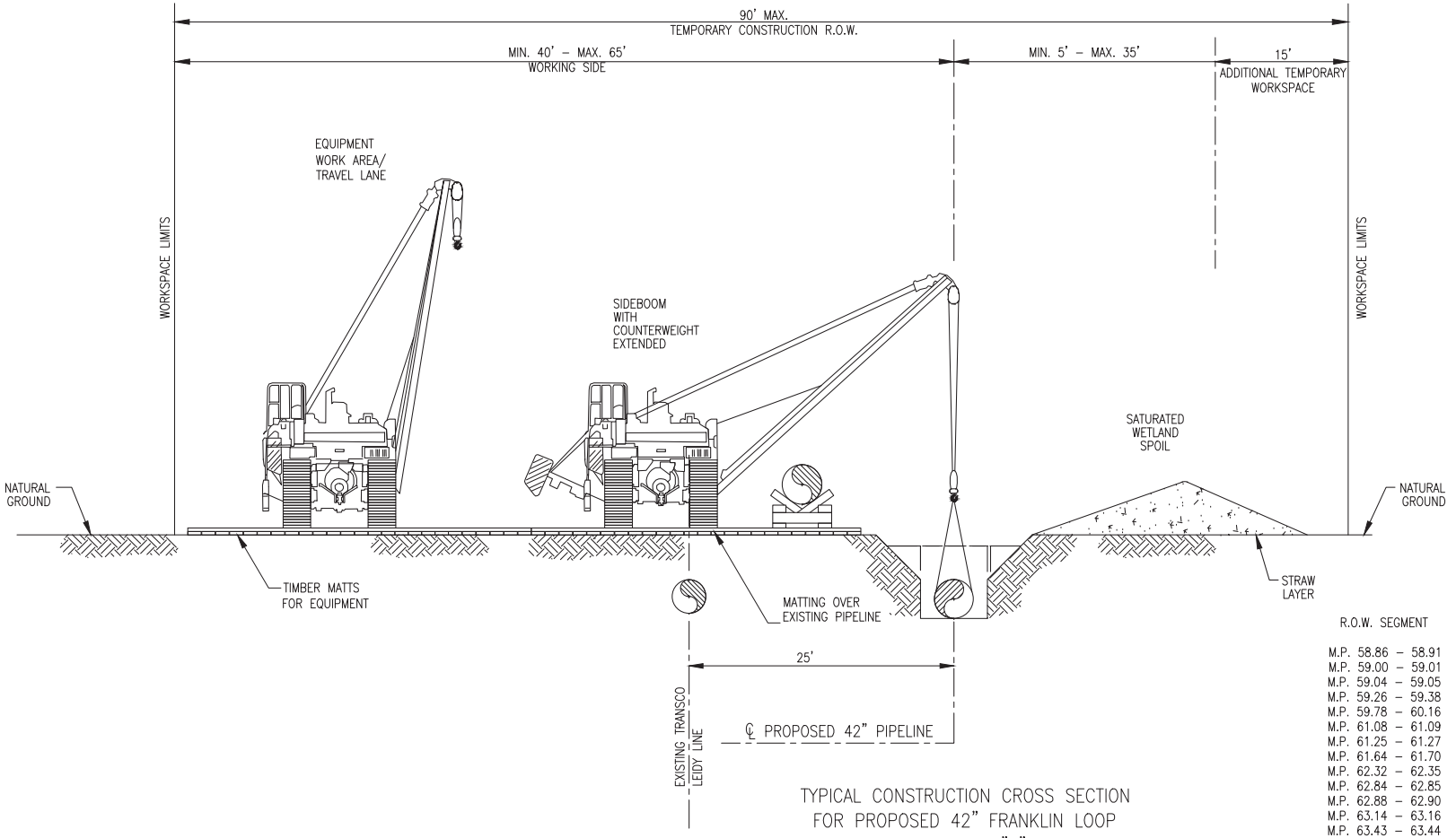
DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANIA

Williams GAS PIPELINE

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-F-7	SHEET 1 OF 1
WO: 1129991		10:39am 9/16/2013 p1graci K:\20345 –Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-7.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"
WITHIN SATURATED WETLAND AREAS

R.O.W. SEGMENT

M.P. 58.86 – 58.91
M.P. 59.00 – 59.01
M.P. 59.04 – 59.05
M.P. 59.26 – 59.38
M.P. 59.78 – 60.16
M.P. 61.08 – 61.09
M.P. 61.25 – 61.27
M.P. 61.64 – 61.70
M.P. 62.32 – 62.35
M.P. 62.84 – 62.85
M.P. 62.88 – 62.90
M.P. 63.14 – 63.16
M.P. 63.43 – 63.44
M.P. 64.15 – 64.44
M.P. 65.89 – 65.91
M.P. 66.85 – 66.87
M.P. 68.13 – 68.15
M.P. 68.44 – 68.47

F-31

DRAWING NO.	REFERENCE TITLE

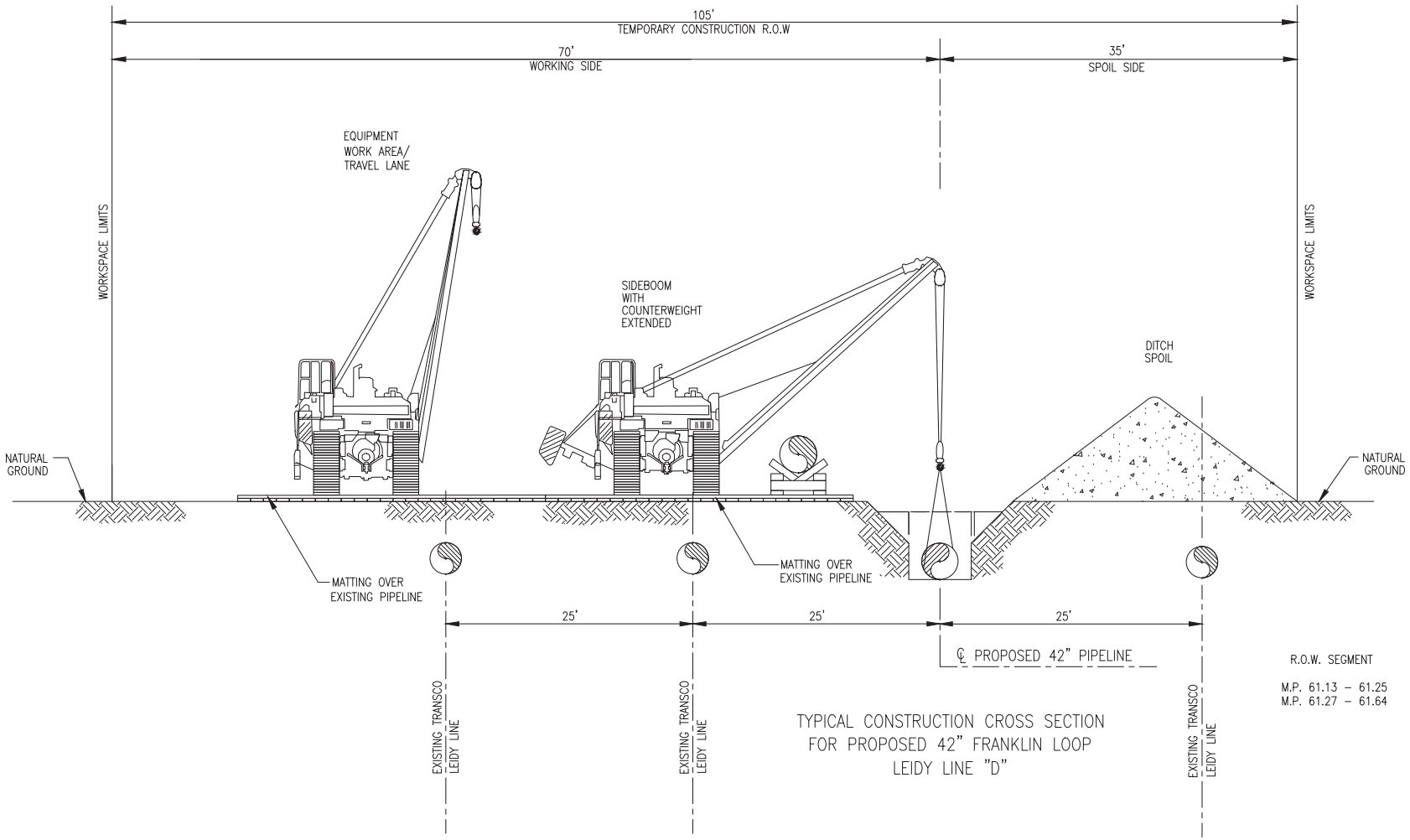
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANNA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-F-8	SHEET 1 OF 1
WO: 1129991		9/16/2013 10:48am p1graci K:\20345 –Franklin Loop\Mapping\Typical\REVISIONS 8-24-13\REVISIONS 9-9-13\F-XS-F-8.dwg	



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" FRANKLIN LOOP
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 61.13 – 61.25
M.P. 61.27 – 61.64

F-32

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" FRANKLIN LOOP
TYPICAL CONSTRUCTION CROSS SECTION
MONROE & LUZERNE COUNTIES, PENNSYLVANNA

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/3/2013	PG	ISSUED FOR SUBMITTAL	1129991	JD	MH
1	9/10/2013	PG	ISSUED FOR FINAL REVIEW	1129991	JD	MH
2	9/18/2013	PG	ISSUED FOR FERC FILING	1129991	JD	MH

Wood Group Mustang, Inc.

DRAWN BY: WGMI	DATE: 8/5/13	ISSUED FOR BID:
CHECKED BY: BB	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:
APPROVED BY: MH	DATE: 9/18/13	
WO: 1129991		

SCALE: N.T.S.

DRAWING NUMBER: F-XS-F-9 SHEET 1 OF 1

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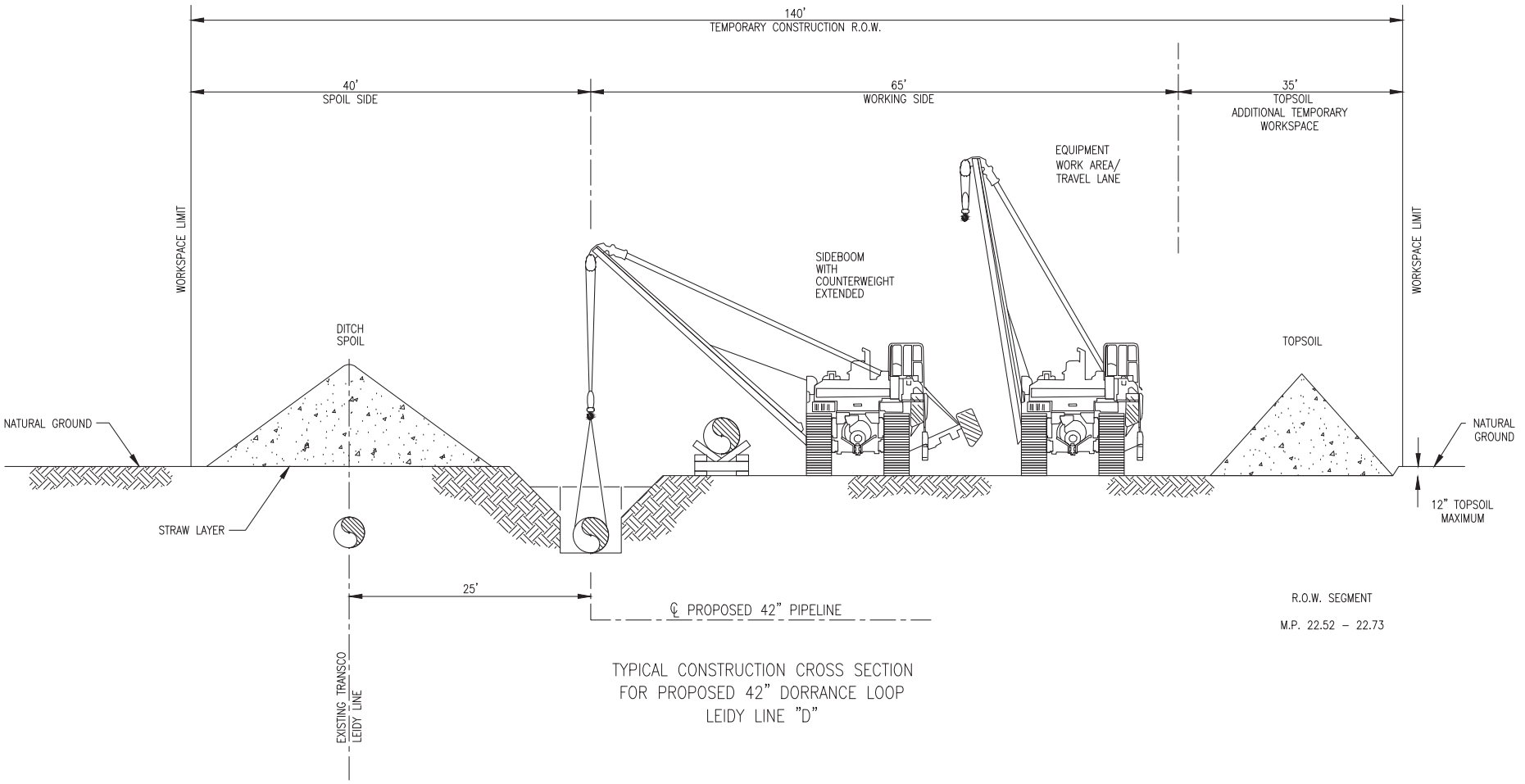


TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" DORRANCE LOOP
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 22.52 – 22.73

F-33

DRAWING NO.	REFERENCE TITLE

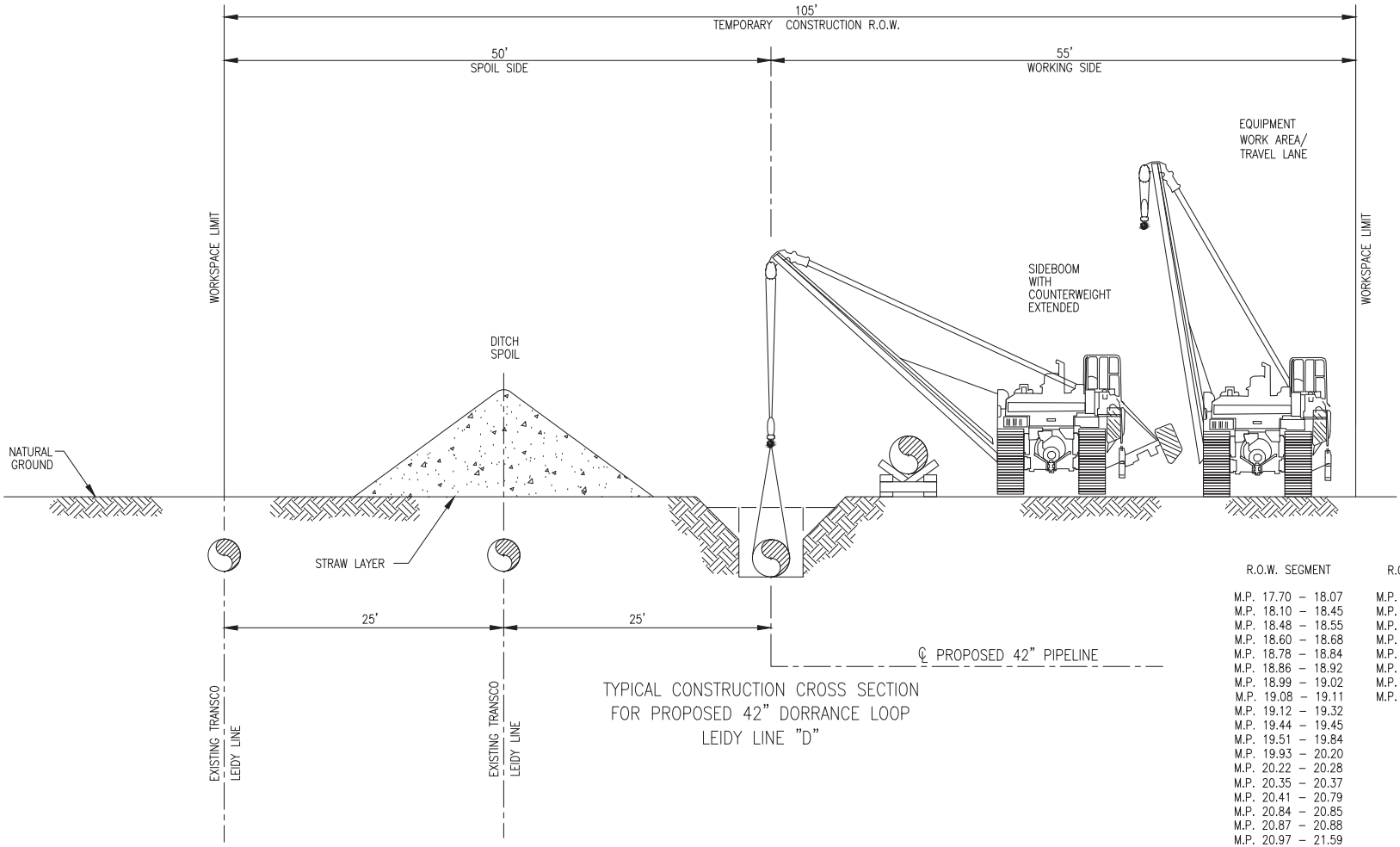
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" DORRANCE LOOP
TYPICAL CONSTRUCTION CROSS SECTION
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	FH	ISSUED FOR SUBMITTAL	1129781	JD	MH
1	9/10/13	FH	ISSUED FOR FINAL REVIEW	1129781	JD	MH
2	9/18/13	FH	ISSUED FOR FERC FILING	1129781	JD	MH

DRAWN BY: WGMI	DATE: 8/02/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-D-1	SHEET 1
W.O. 1129781		9/16/2013 8:44am plgraci K:\20344 – Dorrance Loop\Mapping\Typical\Revisions-8-21-2013\F-XS-D-1.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" DORRANCE LOOP
LEIDY LINE "D"

R.O.W. SEGMENT	R.O.W. SEGMENT
M.P. 17.70 – 18.07	M.P. 21.77 – 21.79
M.P. 18.10 – 18.45	M.P. 21.83 – 22.12
M.P. 18.48 – 18.55	M.P. 22.14 – 22.26
M.P. 18.60 – 18.68	M.P. 22.33 – 22.34
M.P. 18.78 – 18.84	M.P. 22.49 – 22.52
M.P. 18.86 – 18.92	M.P. 22.73 – 22.75
M.P. 18.99 – 19.02	M.P. 22.87 – 22.89
M.P. 19.08 – 19.11	M.P. 22.96 – 22.97
M.P. 19.12 – 19.32	
M.P. 19.44 – 19.45	
M.P. 19.51 – 19.84	
M.P. 19.93 – 20.20	
M.P. 20.22 – 20.28	
M.P. 20.35 – 20.37	
M.P. 20.41 – 20.79	
M.P. 20.84 – 20.85	
M.P. 20.87 – 20.88	
M.P. 20.97 – 21.59	
M.P. 21.61 – 21.76	

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" DORRANCE LOOP
TYPICAL CONSTRUCTION CROSS SECTION
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	FH	ISSUED FOR SUBMITTAL	1129781	JD	MH
1	9/10/13	FH	ISSUED FOR FINAL REVIEW	1129781	JD	MH
2	9/18/13	FH	ISSUED FOR FERC FILING	1129781	JD	MH

DRAWN BY: WGMI	DATE: 8/02/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-D-2	SHEET 1
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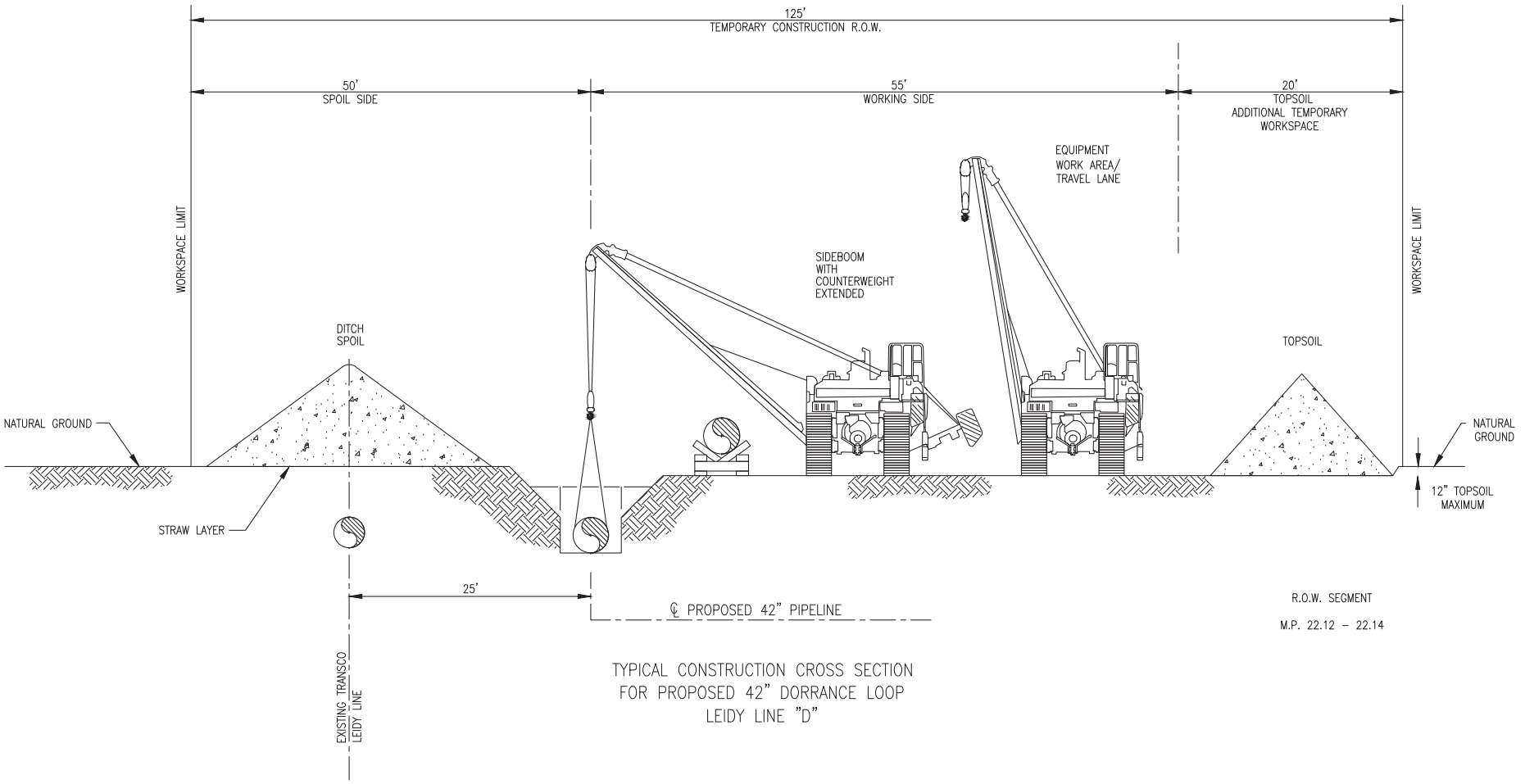


TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" DORRANCE LOOP
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 22.12 – 22.14

F-35

DRAWING NO.	REFERENCE TITLE

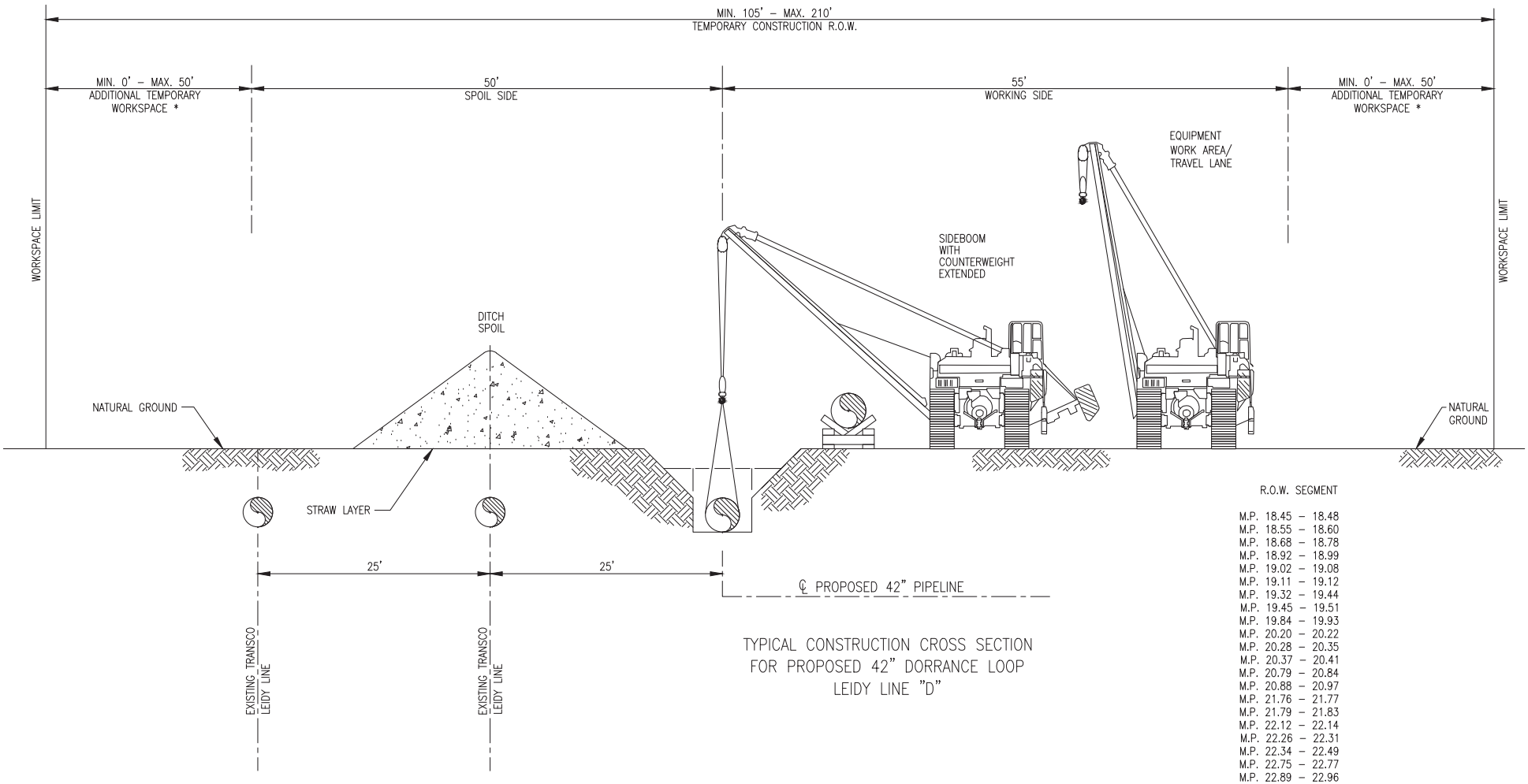
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" DORRANCE LOOP
TYPICAL CONSTRUCTION CROSS SECTION
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	FH	ISSUED FOR SUBMITTAL	1129781	JD	MH
1	9/10/13	FH	ISSUED FOR FINAL REVIEW	1129781	JD	MH
2	9/18/13	FH	ISSUED FOR FERC FILING	1129781	JD	MH

DRAWN BY: WGMI	DATE: 8/02/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/1813	DRAWING NUMBER: F-XS-D-3	SHEET 1
W.O. 1129781		9:17am 9/16/2013 plgraci K:\20344 – Dorrance Loop\Mapping\Typical\Revisions-8-21-2013\F-XS-D-3.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" DORRANCE LOOP
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 18.45 – 18.48
M.P. 18.55 – 18.60
M.P. 18.68 – 18.78
M.P. 18.92 – 18.99
M.P. 19.02 – 19.08
M.P. 19.11 – 19.12
M.P. 19.32 – 19.44
M.P. 19.45 – 19.51
M.P. 19.84 – 19.93
M.P. 20.20 – 20.22
M.P. 20.28 – 20.35
M.P. 20.37 – 20.41
M.P. 20.79 – 20.84
M.P. 20.88 – 20.97
M.P. 21.76 – 21.77
M.P. 21.79 – 21.83
M.P. 22.12 – 22.14
M.P. 22.26 – 22.31
M.P. 22.34 – 22.49
M.P. 22.75 – 22.77
M.P. 22.89 – 22.96

* ADDITIONAL TEMPORARY WORKSPACE FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

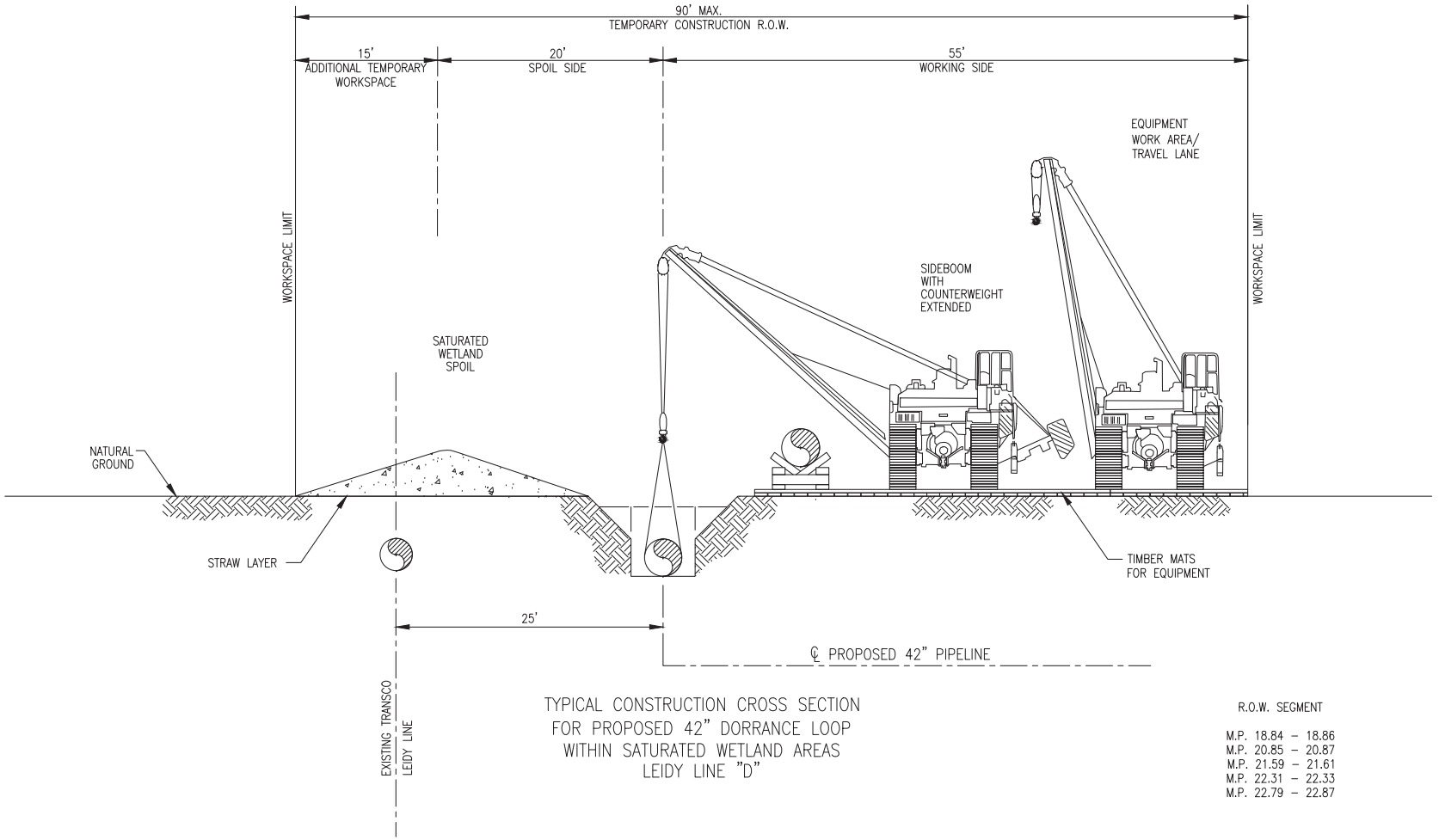
TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" DORRANCE LOOP
TYPICAL CONSTRUCTION CROSS SECTION
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	PG	ISSUED FOR SUBMITTAL	1129781	JD	MH
1	9/10/13	FH	ISSUED FOR FINAL REVIEW	1129781	JD	MH
2	9/18/13	FH	ISSUED FOR FERC FILING	1129781	JD	MH

Wood Group Mustang, Inc.

DRAWN BY: WGMI	DATE: 8/02/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-D-4	SHEET 1
W.O. 1129781		9/16/2013 9:21:am pigraci K:\20344 – Dorrance Loop\Mapping\Typical\Revisions-8-21-2013\F-XS-D-4.dwg	OF 1



TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" DORRANCE LOOP
WITHIN SATURATED WETLAND AREAS
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 18.84 – 18.86
M.P. 20.85 – 20.87
M.P. 21.59 – 21.61
M.P. 22.31 – 22.33
M.P. 22.79 – 22.87

F-37

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" DORRANCE LOOP
TYPICAL CONSTRUCTION CROSS SECTION
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	FH	ISSUED FOR SUBMITTAL	1129781	JD	MH
1	9/10/13	FH	ISSUED FOR FINAL REVIEW	1129781	JD	MH
2	9/18/13	FH	ISSUED FOR FERC FILING	1129781	JD	MH

DRAWN BY: WGMI	DATE: 8/02/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-D-5	SHEET 1
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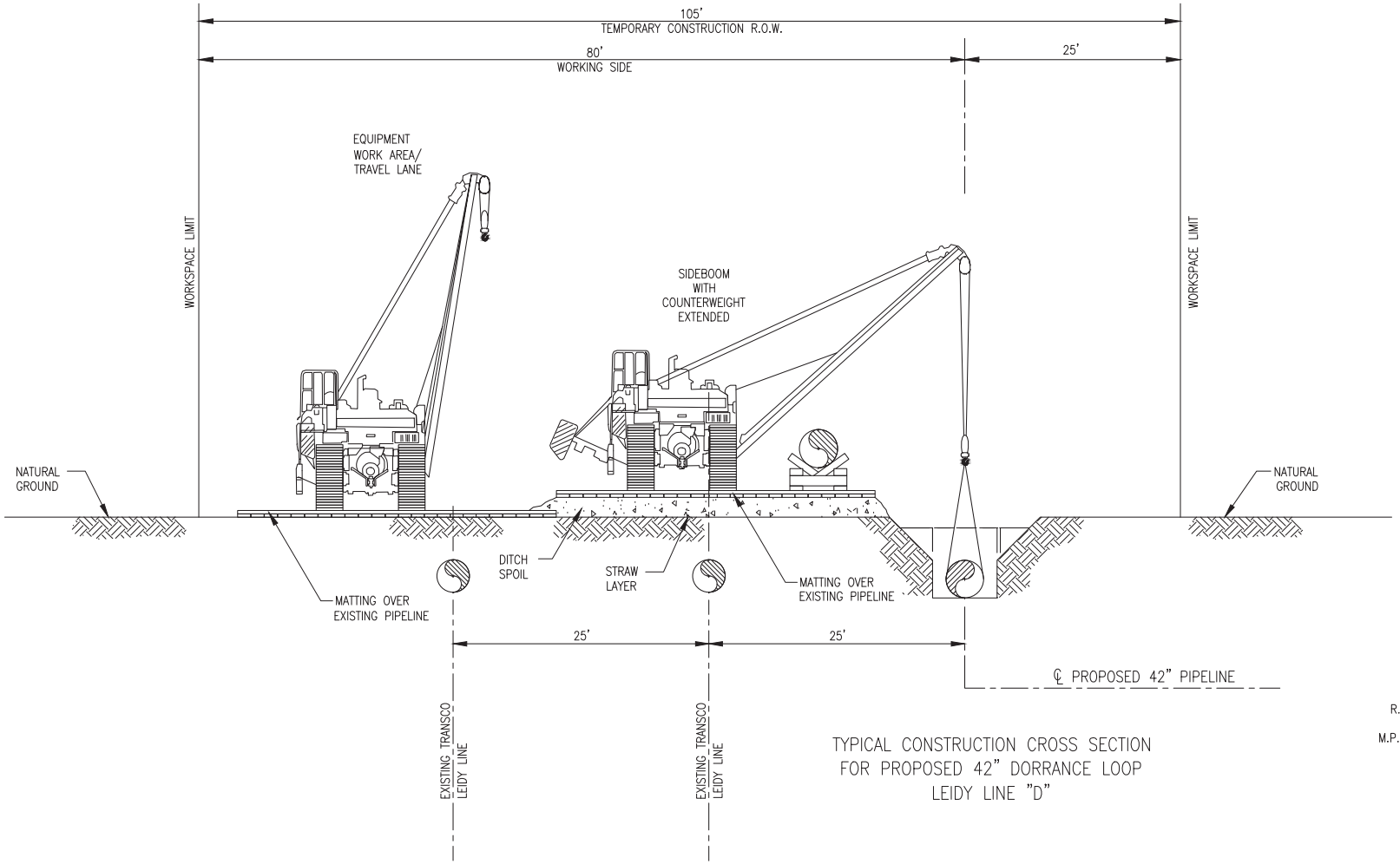

TYPICAL CONSTRUCTION CROSS SECTION
FOR PROPOSED 42" DORRANCE LOOP
LEIDY LINE "D"

R.O.W. SEGMENT

M.P. 18.07 – 18.10

F-38

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
LEIDY SOUTHEAST PROJECT
PROPOSED 42" DORRANCE LOOP
TYPICAL CONSTRUCTION CROSS SECTION
LUZERNE COUNTY, PENNSYLVANIA

Williams GAS PIPELINE

Wood Group Mustang, Inc.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	9/03/13	FH	ISSUED FOR SUBMITTAL	1129781	JD	MH
1	9/10/13	FH	ISSUED FOR FINAL REVIEW	1129781	JD	MH
2	9/18/13	FH	ISSUED FOR FERC FILING	1129781	JD	MH

DRAWN BY: WGMI	DATE: 8/02/13	ISSUED FOR BID:	SCALE: N.T.S.
CHECKED BY: JD	DATE: 9/18/13	ISSUED FOR CONSTRUCTION:	
APPROVED BY: MH	DATE: 9/18/13	DRAWING NUMBER: F-XS-D-6	SHEET 1
WO: 1129781		9:37am 9/16/2013 plgraci K:\20344 – Dorrance Loop\Mapping\Typical\Revisions-8-21-2013\F-XS-D-6.dwg	OF 1

APPENDIX G

WATERBODIES CROSSED BY THE LEIDY SOUTHEAST EXPANSION PROJECT

APPENDIX G

Waterbodies Crossed by the Leidy Southeast Expansion Project

State / Facility / Milepost	Feature ID	Waterbody Name	Crossing Width [a] (feet)	Flow Type	FERC Classification [b]	Fishery Class / Sensitivity [c]	Timing Restriction (avoidance period)	Proposed Crossing Method	Riparian Zone Disturbance (acres)[d]
New Jersey									
Skillman Loop									
1776.9	SS-002-001	Unnamed Tributary to Stony Brook	12	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.8
1777.0	SS-002-002	Unnamed Tributary to Stony Brook	4	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.1
1777.8	SS-010-001	Unnamed Tributary to Stony Brook	6	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.4
1777.9	SS-010-002	Unnamed Tributary to Stony Brook	6	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.5
1778.1	SS-010-003	Unnamed Tributary to Stony Brook	14	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.7
1778.3	SS-002-005	Unnamed Tributary to Beden Brook	3	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.1
1778.4	SS-002-006	Unnamed Tributary to Beden Brook	3	Intermittent	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.0
1778.7	SS-002-007	Unnamed Tributary to Beden Brook	13	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.2
1779.0	SS-002-008	Unnamed Tributary to Beden Brook	12	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.1
1779.0	SS-002-009	Cherry Run	12	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	HDD	0.1
1779.0	SS-002-010 [Crossing 1]	Cherry Run	17	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	HDD	0.1
1779.1	SS-002-010 [Crossing 2]	Cherry Run	11	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	HDD	0.1
1779.5	SS-002-010 [Crossing 3]	Cherry Run	17	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	HDD	0.1
1779.5	SS-002-010 [Crossing 4]	Cherry Run	28	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	HDD	0.1
1779.5	SS-002-010 [Crossing 5]	Cherry Run	29	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	HDD	0.1
1779.7	SS-002-010 [Crossing 6]	Cherry Run	26	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	HDD	0.1
1779.7	SS-002-012	Beden Brook	23	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	HDD	<0.1

APPENDIX G

Waterbodies Crossed by the Leidy Southeast Expansion Project

State / Facility / Milepost	Feature ID	Waterbody Name	Crossing Width [a] (feet)	Flow Type	FERC Classification [b]	Fishery Class / Sensitivity [c]	Timing Restriction (avoidance period)	Proposed Crossing Method	Riparian Zone Disturbance (acres)[d]
1780.3	SS-002-017	Rock Brook	40	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.2
1780.4	SS-002-014	Unnamed Tributary to Rock Brook	8	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	3.6
1781.1	SS-002-016	Back Brook	20	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
1782.1	SS-002-021	Unnamed Tributary to Pike Run	6	Intermittent	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.2
1782.4	SS-002-018	Unnamed Tributary to Pike Run	7	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.5
1782.7	SS-002-019	Ditch to Pike Run	8	Intermittent	Minor	FW2-NT	10/1 – 4/1[e]	Bore	0.0
1782.8	SS-002-020	Ditch to Pike Run	10	Intermittent	Minor	FW2-NT	10/1 – 4/1[e]	Bore	0.0
Pleasant Run Loop									
Access Road AR-PR-04	SS-002-022B	Unnamed Tributary to Pleasant Run	2	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.1
0.39	SS-002-022	Unnamed Tributary to Pleasant Run	10	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
0.66	SS-002-023	Unnamed Tributary to Pleasant Run	7	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
0.73	SS-002-024	Unnamed Tributary to Pleasant Run	10	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.9
1.05	SS-002-025	Unnamed Tributary to Pleasant Run	12	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.7
1.20	SS-002-048	Unnamed Tributary to Pleasant Run	8	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.9
1.44	SS-002-026	Unnamed Tributary to Pleasant Run	6	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
1.72	SS-002-027	Unnamed Tributary to Pleasant Run	9	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
1.83	SS-002-028	Unnamed Tributary to Pleasant Run	15	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.9
1.84	SS-002-029	Pleasant Run	35	Intermediate	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.6

APPENDIX G

Waterbodies Crossed by the Leidy Southeast Expansion Project

State / Facility / Milepost	Feature ID	Waterbody Name	Crossing Width [a] (feet)	Flow Type	FERC Classification [b]	Fishery Class / Sensitivity [c]	Timing Restriction (avoidance period)	Proposed Crossing Method	Riparian Zone Disturbance (acres)[d]
2.06	SS-011-001	Unnamed Tributary to Pleasant Run	5	Ephemeral	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.0
2.26	SS-002-030	Unnamed Tributary to Pleasant Run	12	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
2.84	SS-002-032	Unnamed Tributary to Pleasant Run	11	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.1
2.97	SS-002-029A[g]	Pleasant Run	NA[g]	Intermediate	Minor	FW2-NT	10/1 – 4/1[e]	NA[g]	1.8
3.21	SS-002-033	Unnamed Tributary to Pleasant Run	12	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.7
3.34	SS-002-029B	Pleasant Run	30	Perennial	Intermediate	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.6
3.63	SS-002-034	Unnamed Tributary to Pleasant Run	15	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.3
4.20	SS-002-035	Unnamed Tributary to Pleasant Run	7	Intermittent	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.7
4.23	SS-002-036	Unnamed Tributary to Pleasant Run	8	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
4.46	SS-002-037	Unnamed Tributary to Pleasant Run	10	Intermittent	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	4.0
4.97	SS-002-038	Unnamed Tributary to Pleasant Run	12	Ephemeral	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.2
5.06	SS-002-039	Unnamed Tributary to Pleasant Run	4	Ephemeral	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	0.8
5.11	SS-002-040	Unnamed Tributary to Pleasant Run	6	Ephemeral	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.1
5.34	SS-002-041	Unnamed Tributary to Pleasant Run	14	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0
5.42	SS-002-042 [Crossing 1]	Unnamed Tributary to Pleasant Run	10	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.4
5.56	SS-002-042 [Crossing 2]	Unnamed Tributary to Pleasant Run	10	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.4
5.73	SS-002-043	Unnamed Tributary to Pleasant Run	5	Intermittent	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.2
5.76	SS-002-044	Unnamed Tributary to Pleasant Run	12	Ephemeral	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	1.0

APPENDIX G

Waterbodies Crossed by the Leidy Southeast Expansion Project

State / Facility / Milepost	Feature ID	Waterbody Name	Crossing Width [a] (feet)	Flow Type	FERC Classification [b]	Fishery Class / Sensitivity [c]	Timing Restriction (avoidance period)	Proposed Crossing Method	Riparian Zone Disturbance (acres)[d]
6.16	SS-002-045[f]	Unnamed Tributary to Pleasant Run	NA	Ephemeral	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	0.5
6.16	SS-002-046	Unnamed Tributary to Pleasant Run	15	Perennial	Minor	FW2-NT	10/1 – 4/1[e]	Dam-and-pump, or dry-flumed	2.7
6.54	SS-002-047	Unnamed Tributary to Pleasant Run	6	Ephemeral	Minor	FW2-NT	10/1 – 4/1[e]	Non-flowing Open-Cut	1.1
Pennsylvania									
Franklin Loop									
58.40	SS-001-010	Tunkhannock Creek	30	Perennial	Intermediate	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump	Not Applicable
58.66	SS-001-011	Unnamed Tributary to Tunkhannock Creek	9	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
58.62	SS-001-011A	Unnamed Tributary to Tunkhannock Creek	4	Intermittent	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
58.80	SS-001-012	Unnamed Tributary to Tunkhannock Creek	6	Intermittent	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
59.20	SS-001-013	Unnamed Tributary to Tunkhannock Creek	3	Ephemeral	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
59.44	SS-006-002	Unnamed Tributary to Tunkhannock Creek	8	Intermittent	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
59.49	SS-001-014A	Unnamed Tributary to Tunkhannock Creek	3	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
59.56	SS-001-014B	Unnamed Tributary to Tunkhannock Creek	4	Ephemeral	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
59.56	SS-001-014 [Crossing 1]	Unnamed Tributary to Tunkhannock Creek	10	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
59.55	SS-001-014 [Crossing 2]	Unnamed Tributary to Tunkhannock Creek	10	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
59.59	SS-001-014 [Crossing 3]	Unnamed Tributary to Tunkhannock Creek	10	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
59.62	SS-001-014 [Crossing 4]	Unnamed Tributary to Tunkhannock Creek	10	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
60.12	SS-001-020	Unnamed Tributary to Tobyhanna Creek	11	Perennial	Intermediate	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	

APPENDIX G

Waterbodies Crossed by the Leidy Southeast Expansion Project

State / Facility / Milepost	Feature ID	Waterbody Name	Crossing Width [a] (feet)	Flow Type	FERC Classification [b]	Fishery Class / Sensitivity [c]	Timing Restriction (avoidance period)	Proposed Crossing Method	Riparian Zone Disturbance (acres)[d]
61.03	SS-001-015	Tobyhanna Creek	70	Perennial	Intermediate	HQ-CWF, MF	10/1 – 12/31 [f]	Open Cut	
62.27	SS-001-018	Unnamed Tributary to Two Mile Run	3	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
63.08	SS-001-021	Two Mile Run	15	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
63.23	SS-001-022	Unnamed Tributary to Two Mile Run	5	Ephemeral	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
63.74	SS-001-024	Stony Run	11	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
64.95	SS-001-025	Unnamed Tributary to Lehigh River	9	Perennial	Minor	EV, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
65.48	SS-001-026	Lehigh River	55	Perennial	Intermediate	EV, MF/ WTS	10/1 – 12/31 [f]	Open Cut	
65.90	SS-001-027	Unnamed Tributary to Lehigh River	3	Perennial	Minor	EV, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
66.71	SS-001-028	Unnamed Tributary to Kendall Creek	4	Ephemeral	Minor	EV, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
66.71	SS-001-028A	Unnamed Tributary to Kendall Creek	3	Perennial	Minor	EV, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
67.18	SS-001-029 [Crossing 1]	Kendall Creek	5	Intermittent	Minor	EV, MF/ WTS	10/1 – 12/31 [f]	Non-flowing Open-Cut	
67.42	SS-001-029 [Crossing 2]	Kendall Creek	5	Intermittent	Minor	EV, MF/ WTS	10/1 – 12/31 [f]	Non-flowing Open-Cut	
67.57	SS-001-030 [Crossing 1]	Unnamed Tributary to Kendall Creek	6	Perennial	Minor	EV, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
67.82	SS-001-030 [Crossing 2]	Unnamed Tributary to Kendall Creek	6	Perennial	Minor	EV, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
67.85	SS-001-031	Unnamed Tributary to Stony Run	15	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
67.92	SS-001-032	Unnamed Tributary to Stony Run	9	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
Access Road AR-FR-08	SS-006-001	Unnamed Tributary to Stony Run	10	Intermittent	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	

APPENDIX G

Waterbodies Crossed by the Leidy Southeast Expansion Project

State / Facility / Milepost	Feature ID	Waterbody Name	Crossing Width [a] (feet)	Flow Type	FERC Classification [b]	Fishery Class / Sensitivity [c]	Timing Restriction (avoidance period)	Proposed Crossing Method	Riparian Zone Disturbance (acres)[d]
68.15	SS-001-033	Unnamed Tributary to Stony Run	9	Perennial	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
68.85	SS-009-002	Unknown	1	Intermittent	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
68.95	SS-009-001	Unknown	1	Intermittent	Minor	HQ-CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
Dorrance Loop									
18.44	SS-001-001	Unnamed Tributary to Little Wapwallopen Creek	8	Perennial	Minor	CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
18.66	SS-001-002	Unnamed Tributary to Little Wapwallopen Creek	6	Intermittent	Minor	CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
18.67	SS-001-003	Unnamed Tributary to Little Wapwallopen Creek	3	Perennial	Minor	CWF, MF	10/1 – 12/31 [f]	Non-flowing Open-Cut	
18.83	SS-001-004	Little Wapwallopen Creek	35	Perennial	Intermediate	CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
18.92	SS-001-005	Unnamed Tributary to Little Wapwallopen Creek	10	Perennial	Intermediate	CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
19.10	SS-001-006	Unnamed Tributary to Little Wapwallopen Creek	4	Perennial	Minor	CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
19.45	SS-001-007	Unnamed Tributary to Little Wapwallopen Creek	8	Perennial	Minor	CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
20.84	SS-001-008	Little Wapwallopen Creek	35	Perennial	Intermediate	CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	
21.78	SS-001-009	Unnamed Tributary to Little Wapwallopen Creek	15	Perennial	Intermediate	CWF, MF	10/1 – 12/31 [f]	Dam and Pump	
22.37	SS-003-002	Unnamed Tributary to Little Wapwallopen Creek	20	Perennial	Intermediate	CWF, MF	10/1 – 12/31 [f]	Dam-and-pump, or dry-flumed	

Not Applicable

APPENDIX G

Waterbodies Crossed by the Leidy Southeast Expansion Project

State / Facility / Milepost	Feature ID	Waterbody Name	Crossing Width [a] (feet)	Flow Type	FERC Classification [b]	Fishery Class / Sensitivity [c]	Timing Restriction (avoidance period)	Proposed Crossing Method	Riparian Zone Disturbance (acres)[d]

[a] Crossing Width is the distance from top of bank to top of bank. The milepost provided represents the nearest location of the waterbody to the proposed pipeline.

[b] MI = Minor (<10 feet wide); I = Intermediate (10 - 100 feet wide).

[c] New Jersey Designation

FW2-NT - Freshwater, Non-trout fishery

Pennsylvania Designation

CWF - Cold water fishery

MF - Migratory fishery

HQ-CWF - High quality, Cold water fishery

WTS - Wild Trout Stream

EV – Exceptional Value

[d] In New Jersey, the amount of clearing in the riparian zone adjacent to surface waters is regulated according to the Flood Hazard Area Control Act Rules in NJAC 7:13. The width of the riparian zone is determined by the characteristics of that regulated waterbody:

*Category 1 Waters = 300-foot-wide riparian zone

*Trout production waters, trout maintenance waters, waters that contain documented T&E species habitat, waters that flow through an area containing acid producing soils = 150-foot-wide riparian zone

*All other regulated waters = 50-foot-wide riparian zone

Riparian areas in Pennsylvania are regulated through implementation of the PADEP NPDES Construction Stormwater Permit Program (Chapter 102 Erosion and Sediment Control).

[e] Timing restriction in accordance with Transco's Procedures.

[f] Timing restriction confirmed through consultation with PAFBC.

[g] Riparian zone encroachment only; no direct stream impact.

APPENDIX H

ADDITIONAL TEMPORARY WORKSPACE LOCATED IN AND WITHIN 50 FEET OF WATERBODIES

APPENDIX H

Additional Temporary Workspace Located In and Within 50 Feet of Waterbodies

State/Facility	Milepost	Justification	Waterbody	Distance of Temporary Workspace to Waterbody (feet)
New Jersey				
Skillman Loop	1776.8	Waterbody crossing and sewer line crossing	Unnamed tributary to Stony Brook	0
	1778.0	Waterbody crossing	Unnamed tributary to Stony Brook	10
	1778.1	Waterbody crossing	Unnamed tributary to Stony Brook	5
	1778.3	Waterbody crossing	Unnamed tributary to Beden Brook	40
	1778.4	Waterbody crossing	Unnamed tributary to Beden Brook	45
	1778.6	Waterbody crossing and installation of P.I. (point of inflection), HDD stringing	Unnamed tributary to Beden Brook	25
	1780.3	Waterbody crossing	Unnamed Tributary to Rock Brook	12
	1780.3	Waterbody crossing, road bore, crossover, and four P.I.s	Unnamed tributary to Beden Brook	25
	1781.1	Waterbody crossing	Back Brook	14
	1782.1	Waterbody crossing and road bore	Unnamed tributary to Pike Run	28
	1782.8	Road bore	Ditch to Pike Run	10
	1782.8	Railroad crossing, road bore, truck turn around	Ditch to Pike Run	20
Pleasant Run Loop	0.4	Waterbody crossing, steep slope	Unnamed tributary to Pleasant Run [a]	20
	0.4	Waterbody crossing, steep slope	Unnamed tributary to Pleasant Run [a]	25
	1.0	Waterbody crossing, crossover, and two P.I.s	Unnamed tributary to Pleasant Run	8
	1.0	Waterbody crossing, crossover, and two P.I.s	Unnamed tributary to Pleasant Run	25
	1.0	Waterbody crossing, crossover, and two P.I.s	Unnamed tributary to Pleasant Run	25
	1.2	Waterbody crossing, P.I., side slope, and road bore	Unnamed tributary to Pleasant Run	25
	1.4	Waterbody crossing	Unnamed tributary to Pleasant Run	10
	1.5	Road crossing, topsoil segregation	Unnamed tributary to Pleasant Run	35
	1.9	Road bore, topsoil segregation	Unnamed tributary to Pleasant Run	30
	2.0	Topsoil segregation in residential area	Unnamed tributary to Pleasant Run	35
	2.1	Topsoil segregation in residential area	Unnamed tributary to Pleasant Run	35
	2.3	Waterbody crossing	Unnamed tributary to Pleasant Run	40
	2.8	Waterbody crossing	Pleasant Run	12
	2.8	Waterbody crossing	Unnamed tributary to Pleasant Run	33
	3.0	Saturated wetland crossing	Pleasant Run	30
	3.2	Waterbody crossing, topsoil segregation	Unnamed tributary to Pleasant Run	40
	3.2	Road bore, topsoil segregation	Unnamed tributary to Pleasant Run	45
	3.2	Waterbody crossing, road bore, topsoil segregation	Unnamed tributary to Pleasant Run	45

APPENDIX H

Additional Temporary Workspace Located In and Within 50 Feet of Waterbodies

State/Facility	Milepost	Justification	Waterbody	Distance of Temporary Workspace to Waterbody (feet)
	3.3	Road crossing, P.I.	Pleasant Run	43
	3.6	Road crossing, P.I.	Unnamed tributary to Pleasant Run	45
	3.7	Waterbody and wetland crossing	Unnamed tributary to Pleasant Run	30
	4.2	Waterbody crossing	Unnamed tributary to Pleasant Run	47
	4.2	Waterbody crossing	Unnamed tributary to Pleasant Run	40
	4.4	Waterbody crossing	Unnamed tributary to Pleasant Run	35
	4.5	Waterbody crossing	Unnamed tributary to Pleasant Run	38
	4.5	Waterbody crossing	Unnamed tributary to Pleasant Run	32
	4.5	Waterbody crossing	Unnamed tributary to Pleasant Run	35
	4.8	Waterbody crossing	Unnamed tributary to Pleasant Run	47
	4.9	Waterbody crossing	Unnamed tributary to Pleasant Run	15
	5.0	Waterbody crossing	Unnamed tributary to Pleasant Run	15
	5.0	Waterbody crossing	Unnamed tributary to Pleasant Run	44
	5.1	Waterbody crossing	Unnamed tributary to Pleasant Run	12
	5.1	Waterbody crossing	Unnamed tributary to Pleasant Run	44
	5.1	Waterbody crossing, road bore, topsoil segregation	Unnamed tributary to Pleasant Run	22
	5.4	Topsoil segregation	Unnamed tributary to Pleasant Run	18
	5.4	Saturated wetland crossing	Unnamed tributary to Pleasant Run	0
	5.6	Waterbody crossing, crossover, two P.I.s, topsoil segregation	Unnamed tributary to Pleasant Run	40
	5.6	Waterbody crossing, crossover, two P.I.s, topsoil segregation	Unnamed tributary to Pleasant Run	37
	5.6	Waterbody crossing, crossover, two P.I.s, topsoil segregation	Unnamed tributary to Pleasant Run	40
	5.7	Waterbody crossing	Unnamed tributary to Pleasant Run	40
	5.8	Waterbody crossing, topsoil segregation	Unnamed tributary to Pleasant Run	30
	5.8	Waterbody crossing, topsoil segregation	Unnamed tributary to Pleasant Run	28
	6.1	Waterbody crossing, crossover, P.I.	Unnamed tributary to Pleasant Run	46
	6.2	Waterbody crossing, topsoil segregation	Unnamed tributary to Pleasant Run	30
Pennsylvania				
Franklin Loop	58.4	Waterbody crossing	Tunkhannock Creek	0
	58.4	Waterbody crossing	Tunkhannock Creek	0
	58.5	Waterbody crossing, spoil storage associated with five P.I.s	Unnamed tributary to Tunkhannock Creek	0
	58.5	Waterbody crossing, spoil storage associated with five P.I.s	Unnamed tributary to Tunkhannock Creek	0
	58.7	Waterbody crossing, spoil storage associated with three P.I.s	Unnamed tributary to Tunkhannock Creek	30
	58.7	Waterbody crossing	Unnamed tributary to Tunkhannock Creek	35

APPENDIX H

Additional Temporary Workspace Located In and Within 50 Feet of Waterbodies

State/Facility	Milepost	Justification	Waterbody	Distance of Temporary Workspace to Waterbody (feet)
	58.7	Waterbody crossing	Unnamed tributary to Tunkhannock Creek	45
	59.4	Waterbody and wetland crossing	Unnamed tributary to Tunkhannock Creek	20
	59.5	Waterbody crossing	Unnamed tributary to Tunkhannock Creek	40
	59.6	Waterbody and wetland crossing	Unnamed tributary to Tunkhannock Creek	40
	59.6	Road bore	Unnamed tributary to Tunkhannock Creek	40
	59.7	Waterbody crossing, wetland crossing, road bore	Unnamed tributary to Tunkhannock Creek	10
	59.8	Saturated wetland crossing	Unnamed tributary to Tobyhanna Creek	0
	61.0	Waterbody crossing, four P.I.s, steep bank	Tobyhanna Creek [a]	30
	61.0	Waterbody crossing, spoil storage associated with four P.I.s	Tobyhanna Creek	45
	63.0	Waterbody crossing	Two Mile Run	40
	63.1	Waterbody crossing	Two Mile Run	45
	63.2	Road crossing	Unnamed tributary to Two Mile Run	30
	63.7	Waterbody crossing, crossover, and two P.I.s	Stony Run	10
	63.7	Waterbody crossing, crossover, and two P.I.s	Stony Run	10
	65.5	Waterbody and wetland crossing, hydrostatic test withdrawal/discharge location	Lehigh River	20
	65.5	Waterbody and wetland crossing	Lehigh River	15
	65.5	Waterbody and wetland crossing	Lehigh River	15
	65.5	Saturated wetland crossing	Lehigh River	0
	65.9	Saturated wetland crossing	Unnamed tributary to Lehigh River	0
	66.8	Wetland crossing, steep slopes	Unnamed tributary to Kendall Creek	0
	67.8	Waterbody crossing	Unnamed tributary to Kendall Creek	35
	67.8	Waterbody Crossing	Unnamed tributary to Kendall Creek	45
	67.8	Waterbody Crossing	Unnamed tributary to Kendall Creek	45
	67.8	Waterbody Crossing	Unnamed tributary to Stony Run	45
	67.9	Waterbody Crossing	Unnamed tributary to Stony Run	40
	67.9	Waterbody Crossing	Unnamed tributary to Stony Run	40
	67.9	Waterbody Crossing	Unnamed tributary to Stony Run	40
	68.1	Saturated wetland crossing	Unnamed tributary to Stony Run	0
Dorrance Loop	18.5	Waterbody crossing	Unnamed tributary to Little Wapwallopen Creek	48
	18.7	Waterbody crossing, topsoil segregation	Unnamed tributary to Little Wapwallopen Creek	40
	18.7	Waterbody crossing, topsoil segregation	Little Wapwallopen Creek	45
	19.0	Waterbody crossing, topsoil segregation	Unnamed tributary to Little Wapwallopen Creek	47

APPENDIX H

Additional Temporary Workspace Located In and Within 50 Feet of Waterbodies

State/Facility	Milepost	Justification	Waterbody	Distance of Temporary Workspace to Waterbody (feet)
	19.1	Wetland crossing associated with waterbody, unconsolidated soils, steep slopes	Unnamed tributary to Little Wapwallopen Creek	40
	19.5	Steep slope	Unnamed tributary to Little Wapwallopen Creek	30
	20.8	Waterbody crossing, steep bank	Little Wapwallopen Creek [a]	0
	20.8	Waterbody crossing, steep bank	Little Wapwallopen Creek [a]	0
	20.9	Saturated wetland crossing	Little Wapwallopen Creek	1
	22.4	Waterbody crossing	Unnamed tributary to Little Wapwallopen Creek	0

[a] Trench spoil would be placed within these waterbodies due to space constraints at these locations.

APPENDIX I

WETLANDS AFFECTED BY THE LEIDY SOUTHEAST EXPANSION PROJECT

APPENDIX I

Wetlands Affected by the Leidy Southeast Expansion Project

State / Facility / Milepost Range	Wetland ID	Wetland Type [a]	State Wetland Classification[b]	Crossing Length (feet) [c]	Construction Impacts (acres) [d]	Operation Impacts (acres) [e]	Proposed Crossing Method [f]
New Jersey							
Skillman Loop							
1776.8	WW-002-001[g]	PEM	Ordinary	NA	NA	NA	NA
1776.9	WW-002-004	PEM	Ordinary	24	<0.1	0.0	Open Cut
1776.9	WW-002-002	PEM/PFO	Intermediate	180	0.3	<0.1	Open Cut
1777.0	WW-002-003	PEM	Intermediate	353	0.4	0.0	Open Cut
1777.3	WW-002-005	PEM	Ordinary	93	0.1	0.0	Open Cut
1777.4	WW-002-006[g]	PEM	Ordinary	NA	NA	0.0	NA
1777.7	WW-002-007	PEM/PFO	Intermediate	348	0.5	<0.1	Open Cut
1777.8	WW-012-003	PEM	Ordinary	85	<0.1	0.0	Open Cut
1777.8	WW-012-002	PEM	Ordinary	60	0.1	0.0	Open Cut
1777.9	WW-016-004	PEM	Ordinary	91	0.1	0.0	Open Cut
1778.0	WW-016-002	PEM	Ordinary	30	0.1	0.0	Open Cut
1778.1	WW-012-001	PEM	Ordinary	38	0.2	0.0	Open Cut
1778.2	WW-002-008	PEM	Ordinary	27	0.1	0.0	Open Cut
1778.4	WW-002-009	PEM/PFO	Ordinary	71	0.1	<0.1	Open Cut
1779.1	WW-002-010	PSS	Intermediate	255	<0.1	0.0	HDD
1779.3	WW-002-012	PEM	Intermediate	27	<0.01	0.0	Access Road
1779.4	WW-002-011	PEM	Intermediate	90	<0.1	0.0	HDD
1780.2	WW-002-017	PEM	Intermediate	28	0.1	0.0	Open Cut
1780.4	WW-002-015	PEM	Ordinary	59	<0.1	0.0	Open Cut
1781.1	WW-002-016	PEM	Ordinary	74	<0.1	0.0	Open Cut
1782.0	WW-002-020	PEM	Intermediate	62	<0.1	0.0	Open Cut
1782.5	WW-002-018	PEM	Intermediate	123	0.2	0.0	Open Cut
1782.6	WW-002-019	PEM	Ordinary	348	0.9	0.0	Open Cut
Skillman Loop Subtotal				**2,466**	**3.5**	**0.1**	
Pleasant Run Loop							
0.4	WW-002-021	PEM	Ordinary	44	0.1	0.0	Open Cut
0.7	WW-002-022	PEM	Intermediate	27	0.1	0.0	Open Cut
0.7	WW-011-001	PEM	Ordinary	25	<0.1	0.0	Open Cut
1.0	WW-002-023	PEM	Intermediate	197	<0.1	0.0	Open Cut
1.2	WW-011-002	PEM	Ordinary	32	<0.1	0.0	Open Cut
1.7	WW-011-003	PEM	Ordinary	18	<0.1	0.0	Open Cut
1.8	WW-002-025	PFO/PEM	Intermediate	96	0.3	<0.1	Open Cut
1.84	WW-002-024[g]	PFO	Ordinary	NA	NA	NA	NA
2.07	WW-011-004	PEM	Ordinary	29	<0.1	0.0	Open Cut
2.26	WW-002-026	PEM	Ordinary	56	0.1	0.0	Open Cut
2.63	WW-002-027	PEM	Ordinary	65	0.2	0.0	Open Cut
2.84	WW-011-005	PEM	Intermediate	31	<0.1	0.0	Open Cut
2.96	WW-002-028	PEM	Intermediate	485	0.8	0.0	Open Cut
3.21	WW-011-006	PEM	Ordinary	17	<0.1	0.0	Open Cut
3.63	WW-002-029	PEM	Ordinary	14	<0.1	0.0	Open Cut
5.33	WW-002-030	PEM	Ordinary	9	0.1	0.0	Open Cut
5.42	WW-002-031	PEM	Intermediate	177	0.4	0.0	Open Cut
6.14	WW-002-032	PEM	Intermediate	NA	<0.1	0.0	NA

APPENDIX I

Wetlands Affected by the Leidy Southeast Expansion Project

State / Facility / Milepost Range	Wetland ID	Wetland Type [a]	State Wetland Classification[b]	Crossing Length (feet) [c]	Construction Impacts (acres) [d]	Operation Impacts (acres) [e]	Proposed Crossing Method [f]
Pleasant Run Loop Subtotal				**1,322**	**2.2**	**<0.1**	
New Jersey Subtotal				**3,788**	**5.7**	**0.2**	
Pennsylvania							
Franklin Loop							
57.5 [h]	WW-007-007	PEM	Other	NA	<0.1	0.0	Open Cut
58.4	WW-001-012	PEM	Other	42	<0.1	0.0	Open Cut
58.5	WW-001-013	PFO	Other	63	0.1	<0.1	Open Cut
58.9	WW-001-014	PSS/PFO	Exceptional	274	0.8	0.3	Open Cut
59.0	WW-001-016	PEM/PFO	Other	98	0.4	0.1	Open Cut
59.2	WW-001-019	PEM	Other	9	0.1	0.0	Open Cut
59.3	WW-001-020	PSS/PFO	Exceptional	410	1.2	0.4	Open Cut
59.6	WW-001-021	PEM	Other	33	0.2	0.0	Open Cut
59.8	WW-001-028	PSS/PFO	Exceptional	2031	4.3	1.8	Push/Pull
60.5	WW-001-030	PEM/PFO	Other	123	0.2	<0.1	Open Cut
61.1	WW-001-022	PEM	Other	222	0.2	0.0	Open Cut
61.3	WW-001-024	PEM	Other	105	0.3	0.0	Open Cut
61.6	WW-001-025	PEM	Other	243	0.5	0.0	Open Cut
62.1	WW-001-026	PEM	Other	226	0.2	0.0	Open Cut
62.3	WW-001-027	PEM/PFO	Other	105	0.4	0.0	Open Cut
62.8	WW-001-031	PEM	Other	440	1.1	0.0	Open Cut
63.4	WW-001-032	PEM/PFO	Other	39	0.2	0.0	Open Cut
63.7	WW-001-035	PEM	Other	205	0.1	0.0	Open Cut
64.1	WW-001-036	PSS/PFO	Exceptional	1996	3.2	1.1	Push/Pull
64.9	WW-007-002	PEM	Other	175	0.2	0.0	Open Cut
65.3	WW-006-003	PEM	Other	37	<0.1	0.0	Open Cut
65.4	WW-001-038	PEM	Other	64	0.1	0.0	Open Cut
65.5	WW-001-039	PEM	Other	174	0.6	0.0	Open Cut
65.9	WW-001-040	PEM/PFO	Other	258	0.7	<0.1	Open Cut
66.8	WW-001-041	PEM	Other	135	0.4	0.0	Open Cut
67.0	WW-007-009	PEM	Other	122	0.1	0.0	Open Cut
67.1	WW-001-043	PEM	Other	384	0.3	0.0	Open Cut
67.1	WW-009-002	PFO	Other	677	0.6	0.1	Open Cut
67.9	WW-009-001	PEM	Exceptional	129	0.2	0.0	Open Cut
68.1	WW-001-047	PEM	Other	5	0.2	0.0	Open Cut
68.9	WW-001-050	PEM	Other	180	0.3	0.0	Open Cut
68.7	WW-001-046	PFO	Other	NA	<0.1	0.0	Open Cut
68.8	WW-001-045	PEM	Other	187	0.2	0.0	Open Cut
68.8 [i]	WW-006-004	PEM	Other	NA	<0.1	0.0	Open Cut
69.0	WW-013-001	PEM/PFO	Other	NA	0.1	<0.1	Open Cut
54.6	WW-007-006	PEM	Other	NA	0.1	0.0	Open Cut
Franklin Loop Subtotal				**9,191**	**17.4**	**4.0**	
Dorrance Loop							
17.7	WW-003-003	PEM/PFO	Other	25	<0.1	0.0	Open Cut
18.3	WW-001-001	PFO	Other	62	<0.1	0.0	Open Cut
18.4	WW-001-002	PEM	Other	178	<0.1	0.0	Open Cut
18.6	WW-001-003	PEM	Other	11	0.1	0.0	Open Cut

APPENDIX I

Wetlands Affected by the Leidy Southeast Expansion Project

State / Facility / Milepost Range	Wetland ID	Wetland Type [a]	State Wetland Classification[b]	Crossing Length (feet) [c]	Construction Impacts (acres) [d]	Operation Impacts (acres) [e]	Proposed Crossing Method [f]
18.6	WW-001-004	PEM/PFO	Other	123	0.4	0.0	Open Cut
18.8	WW-001-005	PEM/PFO	Exceptional	368	0.7	<0.1	Open Cut
19.1	WW-001-006	PEM	Other	138	0.2	0.0	Open Cut
19.52	WW-001-008	PEM	Other	33	0.1	0.0	Open Cut
20.84	WW-001-009	PEM	Exceptional	73	0.2	0.0	Open Cut
21.59	WW-001-011	PEM	Other	85	0.3	0.0	Open Cut
22.30	WW-003-004	PEM/PFO	Other	209	0.3	<0.1	Open Cut
22.39	WW-003-006	PEM	Other	10	<0.1	0.0	Open Cut
22.39	WW-003-005	PEM/PFO	Other	158	0.1	0.0	Open Cut
22.46	WW-003-007	PFO/PEM	Other	63	0.1	0.0	Open Cut
22.84	WW-003-008	PEM	Other	130	0.8	0.0	Open Cut
Dorrance Loop Subtotal				**1,666**	**3.4**	**<0.1**	
Pennsylvania Subtotal				**10,857**	**20.8**	**4.1**	
Project Total				**14,645**	**26.5**	**4.3**	

[a] NWI Classification: PEM = Palustrine Emergent Wetland; PSS Palustrine Scrub-Shrub Wetland; PFO = Palustrine Forested Wetland.

[b] New Jersey – as defined in NJAC 7:7A-2.4.

Pennsylvania – as defined in Pennsylvania Administrative Code 25, Chapter 105.17.

[c] Crossing Length in feet is based upon distance of wetland crossed by the proposed centerline. This reflects the mileposts between which the wetland would be impacted by construction (including ATWS). The wetland may not be continuously impacted because the wetland boundary may vary in relation to the workspace limit.

[d] Includes all areas affected by construction, including ATWS.

[e] Includes forested wetlands within new permanently maintained right-of-way; all other wetland types would be allowed to revert to preconstruction conditions.

[f] HDD = Horizontal Directional Drill

[g] Transition zone area impact only.

[h] Wetland WW-007-007 would also be affected by construction activities at MLV505LD90.

[i] Wetland WW-006-004 would also be affected by construction activities at Compressor Station 515/MLV515LD0.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

APPENDIX J

ADDITIONAL TEMPORARY WORKSPACE LOCATED IN OR WITHIN 50 FEET OF WETLANDS

APPENDIX J

Additional Temporary Workspace Located In or Within 50 Feet of Wetlands

State/Facility	Wetland ID	Milepost	Justification [a]	Additional Temporary Workspace Distance from Wetland (feet)
New Jersey				
Skillman Loop	WW-002-004	1776.9	i	0
	WW-002-007	1777.6	c	40
	WW-012-001	1778.0	a	0
	WW-012-001	1778.1	f	0
	WW-002-009	1778.4	b	0
	WW-002-009	1778.4	a	25
	WW-002-011	1779.3	k	25
	WW-002-017	1780.2	b	0
	WW-002-017	1789.3	a,e	0
	WW-002-015	1780.3	a,c,f	0
	WW-002-016	1781.1	a	30
	WW-002-016	1781.1	a	25
	WW-002-020	1782.0	f	0
	WW-002-020	1782.0	f	5
	WW-002-020	1782.1	a,e	5
	WW-002-018	1782.5	b	0
	WW-002-019	1782.6	e	25
	WW-002-019	1782.6	b	0
	WW-002-019	1782.7	c,e,f	0
	WW-002-019	1782.7	c,e,f	12
Pleasant Run Loop	WW-002-021	0.4	a,h	15
	WW-002-021	0.4	a,h	30
	WW-002-021	0.4	e	48
	WW-002-022	0.6	a	35
	WW-002-024	0.7	a	48
	WW-002-024	0.7	a	45
	WW-002-023	1.0	c	10
	WW-002-023	1.0	a,c	10
	WW-002-023	1.0	c,e	25
	WW-011-002	1.0	c,e	15
	WW-011-002	1.2	a,c,f,h	20
	WW-011-003	1.6	a,f	48
	WW-011-003	1.7	a,f	48
	WW-002-025	1.8	f	48
	WW-002-024	1.8	e,f	40
	WW-002-025	1.8	e,f	10
	WW-002-025	1.9	h	20
	WW-011-004	2.0	e	30
	WW-011-004	2.1	e	23
	WW-002-025	2.3	a	35
	WW-002-027	2.6	b	0
	WW-002-027	2.7	e, f	30
	WW-011-005	2.8	a	33
	WW-002-028	2.8	a	5
	WW-002-028	3.0	b	0
	WW-011-006	3.2	a,e	38
	WW-011-006	3.2	a,e,f	40
	WW-011-006	3.2	e,f	35
	WW-002-029	3.6	a	40

APPENDIX J

Additional Temporary Workspace Located In or Within 50 Feet of Wetlands

State/Facility	Wetland ID	Milepost	Justification [a]	Additional Temporary Workspace Distance from Wetland (feet)
	WW-002-029	3.7	a	20
	WW-002-030	5.3	e	0
	WW-002-031	5.3	e	5
	WW-002-031	5.4	b	0
	WW-002-031	5.5	a,e,h	45
	WW-002-031	5.6	a,c,e	45
	WW-002-032	6.2	a,e	25
Pennsylvania				
Franklin Loop	WW-001-012	58.4	a	45
	WW-001-012	58.4	a	0
	WW-001-013	58.5	a,c	0
	WW-001-014	58.9	b	0
	WW-001-014	58.9	l	30
	WW-001-016	59.0	b	0
	WW-001-016	59.1	b	0
	WW-001-019	59.2	l	45
	WW-001-020	59.2	l	30
	WW-001-020	59.3	b	0
	WW-001-020	59.4	l	10
	WW-001-021	59.4	l	40
	WW-001-021	59.6	a,b	30
	WW-001-021	59.6	f	30
	WW-001-028	59.7	f	10
	WW-001-028	59.8	f	0
	WW-001-028	59.8	f	5
	WW-001-028	59.8	b	0
	WW-001-022	61.1	a,c	10
	WW-001-022	61.1	b	0
	WW-001-022	61.1	a,c	20
	WW-001-024	61.3	b	0
	WW-001-025	61.6	e	0
	WW-001-025	61.7	c,f	0
	WW-001-025	61.7	c,f	0
	WW-001-027	62.3	b	0
	WW-001-027	62.4	l	40
	WW-001-031	62.9	b	0
	WW-001-031	62.9	b	0
	WW-001-031	63.0	a	45
	WW-001-031	63.1	a	40
	WW-001-031	63.2	b	0
	WW-001-031	63.2	f	35
	WW-001-034	63.7	l	35
	WW-001-034	63.7	c	20
	WW-001-035	63.7	c	10
	WW-001-036	64.0	b,c	35
	WW-001-036	64.2	b	0
	WW-001-037	64.9	a	30
	WW-001-037	65.0	a	2
	WW-001-038	65.5	a,d	20
	WW-001-038	65.5	a	0

APPENDIX J

Additional Temporary Workspace Located In or Within 50 Feet of Wetlands

State/Facility	Wetland ID	Milepost	Justification [a]	Additional Temporary Workspace Distance from Wetland (feet)
	WW-001-039	65.5	a	0
	WW-001-039	65.5	b	0
	WW-001-039	65.6	b	0
	WW-001-040	65.8	a	10
	WW-001-040	65.9	b	0
	WW-001-041	66.8	a,h	18
	WW-001-041	66.8	b	0
	WW-001-041	66.9	l	45
	WW-009-001	67.9	a	35
	WW-009-001	67.9	a	33
	WW-001-044	68.1	a,c	20
	WW-001-047	68.1	b	0
	WW-001-047	68.2	e	25
	WW-001-050	68.4	e	30
	WW-001-050	68.5	b	0
Dorrance Loop	WW-001-003	18.6	f	48
	WW-001-003	18.6	f	0
	WW-001-003	18.6	f	40
	WW-001-004	18.6	f	30
	WW-001-005	18.8	b	0
	WW-001-006	19.0	a,e	40
	WW-001-006	19.1	a	25
	WW-001-009	20.8	a	0
	WW-001-009	20.8	a	0
	WW-001-009	20.9	b	0
	WW-001-011	21.6	b	0
	WW-003-004	22.3	f	40
	WW-003-004	22.3	f	30
	WW-003-004	22.3	b	0
	WW-003-004	22.4	a	20
	WW-003-005	22.4	a	10
	WW-003-006	22.4	a, e, f, g	15
	WW-003-005	22.4	f, h	45
	WW-003-007	22.4	f, h	40
	WW-003-008	22.8	b	0
	WW-003-008	22.9	f	20

[a] a=waterbody crossing
b=spoil storage in wetland to avoid unnecessary trips through wetland with heavy equipment
c=installation of P.I.s (points of inflection) or crossover
d=access to water source for hydrostatic testing
e=topsoil segregation
f=road/railroad crossing
g=contractor staging area at access road
h=steep slope construction
i=utility crossing
k=HDD entry
l=extra spoil area needed due to multiple wetland/stream crossings adjacent to ATWS

APPENDIX K

STRUCTURES WITHIN 50 FEET OF CONSTRUCTION WORK AREAS

APPENDIX K

Structures within 50 Feet of Construction Work Areas

Loop/ Count	Approximate Milepost	Type Of Structure	Direction from Proposed Pipeline	Distance From Proposed Pipeline (feet)	Distance from Structure to Edge of Construction Workspace (feet)	Proposed Mitigation [a]	Proposed Structure Mitigation Measure
Skillman Loop							
1	1776.8	House	South	N/A	50	N/A	
2	1776.8	Barn	South	N/A	16	N/A	
3	1776.8	Shed	South	N/A	50	N/A	
4	1776.9	In-ground Pool	East	60	25	N, R ,W	
5	1776.9	House	East	48	16	N, R ,W	
6	1777.0	In-ground Pool	East	53	18	N, R ,W	
7	1777.2	House	East	48	13	N, R ,W	
8	1777.3	House	East	40	5	N, R ,W	
9	1777.3	Water Well	East	42	7	N, R ,W	
10	1777.3	Water Well	East	65	30	N, R ,W	
11	1777.4	In-ground Pool	East	45	10	N, R ,W	
12	1777.5	Shed	East	74	39	N, R ,W	
13	1777.5	Shed	East	60	28	N, R ,W	
14	1777.5	Shed	East	48	13	N, R ,W	
15	1778.0	House	East	24	9	N, R ,W	
16	1780.3	Water Well	West	126	2	N/A	
17	1781.0	House	West	91	42	N, R, W	
18	1781.0	House	East	68	19	D, N, R, W	
19	1781.0	Garage	West	12	5	D, N, R, W	
20	1781.0	Leaching Field	East	50	8	D, N, R, W	
21	1781.0	French Drain	East	45	Within Workspace	D, N, R, W	To be matted and protected prior to and during construction.
22	1781.5	House	West	22	92	N, R	
23	1781.5	House	East	49	39	N, R, W	
24	1781.5	Leaching Field	East	48	17	N, R, W	
25	1781.6	House	East	125	25	N/A	
26	1781.6	Leaching Field	West	75	40	N, R, W	
27	1781.7	Aboveground Pool	East	18	Within Workspace	N, R, W	Remove and Relocate
28	1781.7	Play Set	West	20	Within Workspace	N, R, W	Remove and Relocate
29	1781.7	In-ground Pool	East	44	29	N, R	

APPENDIX K

Structures within 50 Feet of Construction Work Areas

Loop/ Count	Approximate Milepost	Type Of Structure	Direction from Proposed Pipeline	Distance From Proposed Pipeline (feet)	Distance from Structure to Edge of Construction Workspace (feet)	Proposed Mitigation [a]	Proposed Structure Mitigation Measure
30	1781.8	Play Set	East	0	Within Workspace	N, R	Remove and Relocate
31	1781.9	Leaching Field	West	80	45	N, W	
32	1782.2	House	East	53	8	N, R	
33	1782.2	Leaching Field	East	19	Within Workspace	N, R	To be matted and protected prior to and during construction.
34	1782.2	House	East	61	6	N, R	
35	1782.2	Leaching Field	East	70	25	N, R	
36	1782.2	Shed	East	25	Within Workspace	N, R	Remove and Relocate
37	1782.2	Leaching Field	West	88	28	C, N, R	
38	1782.2	House	West	75	40	C, N, R	
39	1782.2	In-ground Pool	West	76	41	C, N, R	
40	1782.5	In-ground Pool	West	78	43	C, N, R	
Pleasant Run Loop							
1	0.1	Shed	North	48	1	W	
2	1.2	Shed	North	85	30	W	
3	0.2	Shed	North	83	18	W	
4	0.2	Shed	North	29	4	W	
5	0.5	Shed	South	75	35	N/A	
6	0.5	Shed	South	75	35	N/A	
7	0.6	Shed	South	84	44	N/A	
8	1.3	Tower	South	39	Within Workspace	N/A	To Be Protected
9	1.3	Shed	North	60	Within Workspace	N/A	Remove and Relocate
10	1.4	House	North	93	28	C	
11	1.4	Shed	South	94	39	N/A	
12	1.4	Garage	North	99	24	C	
13	1.5	Shed	South	81	6	N/A	
14	1.5	Water Well	South	78	2	N/A	
15	1.6	Shed	South	58	Within Workspace	N/A	To Be Protected
16	1.6	House	South	77	22	N/A	
17	1.6	Water Well	South	78	20	N/A	
18	2.3	Shed	South	72	7	N/A	
19	2.7	Barn	North	71	31	C	

APPENDIX K

Structures within 50 Feet of Construction Work Areas

Loop/ Count	Approximate Milepost	Type Of Structure	Direction from Proposed Pipeline	Distance From Proposed Pipeline (feet)	Distance from Structure to Edge of Construction Workspace (feet)	Proposed Mitigation [a]	Proposed Structure Mitigation Measure
20	2.9	Shed	North	67	27	C	
21	2.9	Leaching Field	North	71	Within Workspace	C	To be matted and protected prior to and during construction.
22	2.9	Deck	North	116	31	C	
23	2.9	Shed	North	55	4	C	
24	3.2	Shed	North	50	Within Workspace	N/A	Remove and Relocate
25	3.2	Shed	North	154	44	N/A	
26	3.4	House	South	109	44	N/A	
27	3.5	Water Well	North	48	16	R	
28	3.5	House	North	71	39	R	
29	3.7	Shed	NA	0	Within Workspace	N/A	Remove and Relocate
30	3.8	Shed	South	62	22	N/A	
31	3.8	Barn	North	79	14	N/A	
32	3.8	Barn	North	115	50	N/A	
33	3.8	Foundation	North	60	Within Workspace	N/A	To Be Protected
34	3.9	Septic Tank	North	104	39	N/A	
35	3.9	House	North	86	21	N/A	
36	5.1	Garage	South	100	50	N/A	
37	5.2	Leaching Field	North	22	6	R, W	
38	5.2	Septic Tank	North	27	11	R, W	
39	5.2	House	North	43	18	R, W	
40	5.8	Leaching Field	North	26	Within Workspace	N, R, W	To be matted and protected prior to and during construction.
41	5.9	In-ground Pool	North	36	10	N, R, W	
42	5.9	Garage	North	30	5	N, R, W	
43	6.0	Shed	North	81	5	N/A	
44	6.0	House	North	113	48	N/A	
45	6.6	Leaching Field	North	46	Within Workspace	R, W	To Be Protected
46	6.7	Shed	North	29	4	R, W	
47	6.7	House	North	80	25	N/A	
48	6.7	Leaching Field	North	0	Within Workspace	N/A	Relocate Prior to Construction
49	6.7	Septic Tank	North	67	7	N/A	

APPENDIX K

Structures within 50 Feet of Construction Work Areas

Loop/ Count	Approximate Milepost	Type Of Structure	Direction from Proposed Pipeline	Distance From Proposed Pipeline (feet)	Distance from Structure to Edge of Construction Workspace (feet)	Proposed Mitigation [a]	Proposed Structure Mitigation Measure
50	6.7	In-ground Pool	South	96	46	N/A	
51	6.8	Garage	South	102	17	N/A	
52	6.8	Shed	South	106	21	N/A	
53	6.8	Shed	North	81	26	N/A	
54	6.8	Portable Shelter	N/A	0	Within Workspace	R, W	Remove and Relocate
55	6.8	Garage	South	23	3	R, W	
56	6.8	House	North	55	30	R, W	
57	6.9	House	North	134	48	N/A	
58	6.9	Septic Tank	North	81	13	N/A	
59	6.9	Septic Tank	North	81	17	N/A	
60	6.9	Leaching Field	North	73	8	N/A	
Franklin Loop							
1	58.0	Shed	East	30	Within Workspace	R, W	Remove and Relocate
2	58.0	Shed	East	0	Within Workspace	R, W	Remove and Relocate
3	58.0	In-ground Pool	East	13	Within Workspace	R, W	Remove and Relocate
4	58.0	House	East	39	8	R, W	
5	58.0	House	East	6	Within Workspace	R, W	To Be Protected
6	58.0	Water Well	East	44	37	R, W	
7	58.0	Shed	East	80	50	R, W	
8	59.6	Shed	West	N/A	36	N/A	
9	61.5	Shed	East	66	31	C, W	
10	61.5	House	East	85	50	C, W	
11	61.5	Water Well	East	84	49	C, W	
12	61.5	House	West	105	35	C, W	
13	61.6	Leaching Field	East	45	10	C, W	
14	61.6	House	East	83	48	C, W	
15	61.6	House	West	120	50	C, W	
16	61.6	Post	West	88	18	C, W	
17	61.7	Shed	East	74	10	C, R, W	
18	61.7	Station Piping	West	57	7	W	
19	61.7	Station Building	West	60	10	W	

APPENDIX K

Structures within 50 Feet of Construction Work Areas

Loop/ Count	Approximate Milepost	Type Of Structure	Direction from Proposed Pipeline	Distance From Proposed Pipeline (feet)	Distance from Structure to Edge of Construction Workspace (feet)	Proposed Mitigation [a]	Proposed Structure Mitigation Measure
20	61.7	Station Building	West	31	Within Workspace	W	To Be Protected
21	61.7	Station Building	West	64	14	W	
22	62.0	House	West	103	38	C, W	
23	62.0	Shed	West	100	35	C, W	
24	62.1	Shed	West	87	22	C, W	
25	62.1	Shed	West	114	49	C, W	
26	62.2	Water Well	West	60	Within Workspace	C, W	To Be Protected
27	62.2	Shed	West	70	5	C, W	
28	62.3	Garage	East	75	35	C, W	
29	62.3	Shed	East	42	2	C, W	
30	62.3	Water Well	West	105	40		
31	62.3	Shed	West	82	17	C, W	
32	62.5	House	East	89	49	C, W	
33	62.5	Water Well	East	81	41	C, W	
34	62.5	Water Well	East	51	11	C, W	
35	62.5	Shed	East	53	13	C, W	
36	62.5	House	East	54	14	C, W	
37	62.5	Garage	East	74	34	C, W	
38	62.5	Shed	West	105	50	C, W	
39	62.5	Shed	West	59	Within Workspace	C, W	Remove and Relocate
40	62.6	Shed	West	103	38	C, W	
41	62.6	Water Well	West	85	20	C, W	
42	62.6	Water Well	East	32	Within Workspace	C, W	To Be Protected
43	63.3	Barn	East	43	5	R	
44	63.7	Water Well	East	61	26	N/A	
45	65.3	House	West	69	34	W	
46	65.3	Shed	West	67	12	W	
47	65.8	House	West	N/A	44	N/A	
48	67.8	Shed	West	N/A	17	N/A	
49	68.4	Water Well	East	79	39	W	

APPENDIX K

Structures within 50 Feet of Construction Work Areas

Loop/ Count	Approximate Milepost	Type Of Structure	Direction from Proposed Pipeline	Distance From Proposed Pipeline (feet)	Distance from Structure to Edge of Construction Workspace (feet)	Proposed Mitigation [a]	Proposed Structure Mitigation Measure
Dorrance Loop							
1	18.1	Shed	North	35	10	W	
2	19.3	Shed	North	92	34	N/A	
3	19.3	Shed	South	104	44	N/A	
4	19.4	Water Well	North	95	36		
5	19.4	House	North	80	16	N/A	
6	19.8	House	South	NA	40	N/A	
7	22.0	Shed	South	91	41	N/A	
8	22.1	Shed	South	79	29	N/A	
9	22.2	Shed	South	69	19	N/A	
10	22.2	Shed	South	78	28	N/A	
11	22.2	Shed	South	83	33	N/A	
12	22.2	Shed	South	91	41	N/A	
13	22.2	Shed	South	91	41	N/A	
14	22.2	Shed	South	83	33	N/A	
15	22.2	Shed	South	85	35	N/A	
16	22.6	Shed	South	65	25	N/A	
17	22.6	Shed	South	65	25	N/A	
18	22.6	Shed	South	99	49	N/A	
19	22.8	Abandoned Mobile Home	NA	0	Within Workspace	N/A	To Be Removed Prior To Construction

[a] C = Pipeline Crossovers; D = Drag Section; N = Reduced Pipeline Separation; R = Reduced Construction Right-of-Way; W = Working Over Existing Pipeline