EQUITRANS

Equitrans Expansion Project

Docket No. CP16-__-000

Resource Report 7 – Soils

October 2015

Equitrans Expansion Project
Resource Report 7 – Soils

Resource Report 7 Filing Requirements	
Information	**Location in Resource Report**
Minimum Filing Requirements	
1. Identify, describe, and group by milepost the soils affected by the proposed pipeline and aboveground facilities. (§ 380.12(l)(1)) • List the soil associations by milepost and describe their characteristics.	Section 7.2 Section 7.3 Appendix 7-A Appendix 7-B
2. For aboveground facilities that would occupy sites over 5 acres, determine the acreage of prime farmland soils that would be affected by construction and operation. (§ 380.12(l)(2)) • List the soil series, describe their characteristics and percentages within the site. • Indicate the onsite percentage of each series that would be permanently affected. • Indicate which series are considered "prime or unique farmland."	Section 7.3.2 Appendix 7-B
3. Describe by milepost potential impacts on soils. (§ 380.12(l)(3,4))	Section 7.2.2 Appendix 7-A
4. Identify proposed mitigation to minimize impact on soils and compare with the staff's Upland Erosion Control, Revegetation, and Maintenance Plan. (§ 380.12(l)(5)) • Identify any measures of the Plan that are deemed unnecessary, technically infeasible, or unsuitable and describe alternative measures that will ensure an equal or greater level of protection.	Section 7.3

FERC Environmental Information Request for Resource Report 7 Dated September 28, 2015	
Request	**Location in Resource Report**
Draft RR7 – Soils	
1. Include a discussion of contaminated areas that may be located along the proposed route and the potential for discovery of unknown soil contamination that could be encountered during construction of the proposed Project. Include the following: a. sources searched to identified potentially contaminated areas; and b. an Unanticipated Discovery of Contamination Plan.	Section 7.3
2. Include both a summary table of all soil limitations and detailed impact tables for all other Project facilities including access roads, meter stations, extra work spaces, contractor yards, and pipe storage yards.	Response will be provided in a subsequent filing to FERC.

FERC Environmental Information Request for Resource Report 7 Dated September 28, 2015	
Request	**Location in Resource Report**
3. Revise Table 7.3-1 and Section 7.3 to include: a. categories for stony/rocky soils, shallow depth to bedrock, and poor drainage potential; and b. impacts for soils that would be temporarily disturbed through construction and soils that would be permanently impacted through operation.	Section 7.3, Table 7.3.1
4. Revise Section 7.3.1 to include a discussion of monitoring in agricultural areas. Specify: a. who would be responsible for monitoring; b. what would be monitored; c. the frequency of monitoring; and d. how long monitoring would be conducted post construction.	Section 7.3.1
5. Section 7.3.2 states segregated topsoil would be stockpiled and "temporarily seeded and stabilized (e.g., with mulch and ECDs where necessary)…" Clarify what is meant by "seeded." Clarify if Equitrans would apply a seed mix to the topsoil piles.	Section 7.3.2
6. Section 7.3.4 states "Although not anticipated, Equitrans would develop a Winter Stabilization Plan if construction and adequate revegetation and stabilization are not completed in time for the winter." Clarify if this plan would be in addition to the Winterization Plan provided as appendix 1K of RR1.	Section 7.3.4
7. Revise section 7.3.5 to specify the following details regarding soil decompaction mitigation measures: a. how areas of heavy compaction would be identified; and b. when decompaction would be considered complete.	Section 7.3.5
8. Section 7.3.6 states Equitrans may add fertilizers and/or lime to aid in revegetation. Identify all fertilizers and amounts by MP and the conditions under which Equitrans would use these soil amendments.	Section 7.3.6
Appendices 7-A and 7-B	
1. Revise appendices 7A and 7B to include each of the soil limitations as presented in table 7.3-1 (including stony/rocky soils, shallow depth to bedrock, and poor drainage potential) by milepost for each pipeline segment and each aboveground facility (including the interconnection and tap).	Response will be provided in a subsequent filing to FERC.

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LIST OF ACRONYMS AND ABBREVIATIONS

E&SCP	Erosion and Sediment Control Plan
ECD	erosion control device
Equitrans	Equitrans, L.P.
FERC or Commission	Federal Energy Regulatory Commission
GIS	Geographic Information System
HDD	horizontal directional drilling
L/R	Launcher/Receiver
MLRA	Major Land Resource Area
NRCS	Natural Resources Conservation Service
Plan	FERC's May 2013 version of the Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	FERC's May 2013 version of the Wetland and Waterbody Construction and Mitigation Procedures
Project	Equitrans Expansion Project
SSURGO	Soil Survey Geographic database

RESOURCE REPORT 7
SOILS

Introduction

Equitrans, L.P. (Equitrans) is seeking a Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC or Commission) pursuant to Section 7(c) of the Natural Gas Act, authorizing it to construct and operate the Equitrans Expansion Project (Project) located in three counties in Pennsylvania and one county in West Virginia. Equitrans plans to construct approximately 7.87 miles of pipeline (at multiple separate locations), a new compressor station, an interconnect with the proposed Mountain Valley Pipeline (MVP), and ancillary facilities. In addition, Equitrans is seeking authorization pursuant to Section 7(b) of the Natural Gas Act to abandon an existing compressor station following the construction of the new compressor station.

The Project is designed to transport natural gas from the northern portion of the Equitrans system south to the new interconnect with MVP, as well as to existing interconnects with Texas Eastern Transmission, LP (Texas Eastern), Dominion Transmission, Inc., and Columbia Gas Transmission, LLC. The Project will provide shippers with additional flexibility to transport natural gas produced in the central Appalachian Basin to meet the growing demand by local distribution companies, industrial users, and power generation facilities located in local, northeastern, Mid-Atlantic, and southeastern regions of the United States. The Project will also increase system reliability, efficiency, and operational flexibility for the benefit of all Equitrans customers. The Project is designed to add up to 600,000 dekatherms per day of north-south firm capacity on the Equitrans system.

In order to minimize impacts on soils along the pipeline route, Equitrans is committed to implementing the best management practices and mitigation measures included in the May 2013 version of the FERC Upland Erosion Control, Revegetation and Maintenance Plan (Plan; FERC 2013a) and the FERC Wetland and Waterbody Construction and Mitigation Procedures (Procedures; FERC 2013b). Any specific deviations from the FERC Plan and Procedures are described in Section 1.4 of Resource Report 1.

Environmental Resource Report Organization

Resource Report 7 was prepared and organized according to the FERC *Guidance Manual for Environmental Report Preparation* (FERC 2002). This report provides a description and supporting information regarding soils that will be crossed or underlain by the Project. A description of the methods used to identify which soils are crossed or underlain by the proposed pipelines and the aboveground and ancillary facilities, as well as descriptions of important soil attributes, are included in Section 7.1. A summary of the existing soil resources that will be crossed by the proposed pipelines or underlain by the proposed aboveground and ancillary facilities is provided in Section 7.2. Potential soil impacts and limitations due to the construction and operation of the Project are discussed in Section 7.3. Section 7.3 also includes a description of the measures that Equitrans will implement to avoid, minimize, and mitigate those impacts. A discussion of agency consultations is included in Section 7.4. Lastly, Section 7.5 includes a list of the references cited for this report.

7.1 IDENTIFICATION OF SOILS

7.1.1 Identification of Soils from SSURGO Database Queries and GIS Analysis

This resource report identifies the soil types (i.e., soil map units) that will be crossed or underlain by the Project facilities; and describes the soil attributes, potential impacts, and mitigation measures that will be used by the Project.

The soil types that will be crossed or underlain by the Project's facilities were identified by using ArcGIS, a computerized Geographic Information System (GIS), to overlay a digital version of the proposed pipeline routes and other Project facility footprints over the Soil Survey Geographic (SSURGO) spatial database of soils data developed by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) (Soil Survey Staff 2015a).

A GIS overlay analysis was used to identify and list the sequential beginning and ending mileposts where the proposed pipelines cross each soil map unit. A similar GIS overlay analysis was used to query the soil types and areas that underlie the proposed aboveground facilities.

7.1.2 Descriptions and Methodologies for Assessing Soil Resources

Each soil map unit identified by the GIS analysis relates to a specific "soil series," which is the lowest, most homogeneous class in the soil taxonomy system. Each soil series has distinct soil attributes that are defined by the NRCS and included in the SSURGO and Web Soil Survey online databases (Soil Survey Staff 2015a, 2015b). These online databases provide soil series level information, similar to what is provided in traditional county soil surveys. The soil attributes include physical and chemical properties and interpretive groupings produced by the NRCS, including attributes that relate to construction, right-of-way restoration, or potential soil impacts. Examples of those soil attributes include the topographic setting and average slope, hydric soil conditions, drainage characteristics, susceptibility to water and wind erosion, suitability for use as farmland, etc.

In a few instances, some soil attribute data published by the NRCS (Soil Survey Staff 2015b) were not rated or included for every soil mapping unit. Therefore, some percentages are based on the known ratings or values divided by the total acreage for each facility.

7.1.2.1 Topographic Setting and Representative Slope

The NRCS distinguishes soils based in part on their topographic setting (e.g., hillslopes, flood plains) and range of slope. The topographic setting indicates where the soil is likely to be found (e.g., in floodplains, hillslopes), how it was formed, and may indicate information about other soil properties that can affect interpretive groupings. Information about the topographic setting was taken from the Landform category in the Web Soil Survey attribute data, which included the Hydric Soil List – All Components soil data.

Slope is an important feature to consider for soil impacts and mitigation. Soil series are typically divided into soil map units largely based on slope. For instance, the Dormont soil series is divided into five soil map units: 0 to 3 percent slopes (DoA), 3 to 8 percent slopes (DoB), 8 to 15 percent slopes (DoC), 15 to 25 percent slopes (DoD), and 25 to 35 percent slopes (DoE). Steeper slopes can indicate a greater susceptibility to erosion, or greater difficulty in re-establishing vegetation. The Web Soil Survey data includes a Representative Slope attribute, which is a single number that represents the range of the slope percentages associated with a soil map unit. For example, the Representative Slope for Dormont silt loam,

8 to 15 percent slopes, is 12. The Representative Slope was further categorized for the purposes of this resource report by following the FERC's Plan. Thus, Representative Slopes of 0 to 5 percent are characterized as "slight," Representative Slopes of 5 to 15 percent are characterized as "moderate," slopes greater than 15 to 30 percent are characterized as "steep," and anything listed as greater than 30 percent is characterized as "very steep."

7.1.2.2 Prime Farmland and Farmland of Statewide Importance

Prime Farmland is defined by the NRCS as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses" (Soil Survey Staff 2015c). Prime Farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent, prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered Prime Farmland if the limiting factor is mitigated (e.g., artificial drainage in bottomlands). This designation relates to soil characteristics and not necessarily the existing land use; hence, it includes cultivated land, pasture, woodland, or other lands that are either used for food or fiber crops or vacant land that could be made available for these uses. Developed land and open water are excluded from Prime Farmland designation.

In addition to Prime Farmland, some states (including Pennsylvania and West Virginia) have designated certain soils as Farmland of Statewide Importance. These lands and soils are also important for agricultural production. The NRCS states that "Generally, [Farmland of Statewide Importance] includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable" (Soil Survey Staff 2015c). The NRCS database (Soil Survey Staff 2015b) includes a specific attribute which identifies the farmland designation of a soil as Prime Farmland, Farmland of Statewide Importance, or Not Prime Farmland.

7.1.2.3 Hydric Soils

Hydric soils are soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper portion of the soil column (Soil Survey Staff 2015b). Generally, hydric soils are those soils that are poorly drained or very poorly drained. Hydric soils may indicate the presence of wetlands, high water tables, or buried agricultural drain tiles. The NRCS databases include a hydric soils attribute that specifies whether a soil is classified as hydric or not, as well as flooding frequency (Soil Survey Staff 2015a, 2015b). The hydric rating of each soil map unit was taken from the Hydric Soil – All Components attribute. The flooding frequency attribute included in the NRCS databases was also reviewed.

7.1.2.4 Soil Erosion Due to Water or Wind

Soil erosion is an ongoing natural process due primarily to the action of water or wind. It involves the disturbance, transport, and deposition of soil particles – most often by water or wind. Three factors were examined for this resource report to determine which soil types are likely to be highly erodible due to water (susceptibility to wind erosion was assessed separately): the erosion factor for the whole soil (Kw), the representative slope, and the nonirrigated land capability rating.

The NRCS characterizes the relative susceptibility of each soil type to sheet and rill erosion by water and determines an erosion factor. This resource report examined the erodibility of the whole soil (Kw), rather

than just the soil particles of a certain soil layer. The erosion factor is based primarily on the percentage of silt, sand, and organic matter and on soil structure and saturation. Soils most susceptible to erosion by water are typified by bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. The NRCS ranks soils on a scale of 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water (Soil Survey Staff 2012). This number was further ranked into three categories: "slight" (0.02 to 0.24), "moderate" (0.25 to 0.46), and "high" (0.47 to 0.69). The Kw ranking was elevated from "moderate" to "highly erodible" when associated with steep slopes and when the Nonirrigated Capability Subclass included an "e," which indicates that erosion is a potential hazard for the soil type.

Wind can also be a significant driver of soil erosion. An analysis of the susceptibility to wind erosion was based on the wind erodibility group attribute, which the NRCS has specifically assigned to each soil type. Wind erodibility is listed on a scale of 1 to 8, where 1 is for soils that are the most highly susceptible to wind erosion (Soil Survey Staff 2012). Soils with a wind erodibility group of 1 to 4 were ranked with a high potential for erosion due to wind.

7.1.2.5 Soil Compaction

Soil compaction is the compression of the soil that leads to the loss or decrease of soil structure and porosity. It is often caused by the pressure or weight of heavy machinery and equipment that compresses the soil, particularly when the soil is wet. The degree of compaction depends on moisture content and soil texture. Fine-textured soils (i.e., a high clay content) with poor internal drainage that are moist or saturated during construction are the most susceptible to compaction and rutting. Soil compaction can also be caused by the loss of soil organic matter, or the loss of soil structure from agricultural or construction practices.

Soil compaction can reduce soil productivity and lead to poor soil aeration, poor plant rooting, decreased infiltration, increased runoff and erosion potential, and rutting.

Soil compaction can be measured in the field, but susceptibility to soil compaction cannot be accurately determined based on the generalized characteristics of a soil type. Soil compaction is influenced by physical characteristics (e.g., soil texture, soil moisture, water table depth), as well as current and historic activities (e.g., how and when vehicles and equipment were used, plowing and decompaction activities, etc.). Therefore, the relative susceptibility of soil compaction can be approximated by identifying 1) soils with poor drainage (somewhat poorly drained to poorly drained), 2) a high clay content (greater than 20 percent), or 3) a surface soil texture characterized as sandy clay loam or dominated by finer particles. Soils with any of these characteristics were flagged as potentially susceptible to soil compaction.

7.1.2.6 Poor Revegetation Potential

Most of the areas disturbed by construction will be restored through revegetation. However, some physical and chemical conditions can make revegetation more challenging, so these areas can be identified and additional mitigation measures can be planned to improve revegetation success. Four factors were assessed to evaluate the potential for revegetation problems. Soils were assessed as potentially susceptible to revegetation problems if they 1) have a surface texture of sandy loam or coarser, 2) they are somewhat excessively drained to excessively drained, 3) have slopes greater than 15 percent, or 4) have severe limitations (i.e., a Nonirrigated Capability Class of 3 or higher).

7.2 EXISTING SOIL RESOURCES

This section identifies the broad geographic setting of the Project and summarizes the soils that will be crossed or that underlie the proposed facilities.

Based on a review of the SSURGO database, the Project will cross a total of 24 soil series and 39 soil map units. Appendix 7-A lists the soil types (i.e., soil map units) crossed by the proposed pipelines. Appendix 7-A provides similar information for the soils that will underlie proposed aboveground facilities. However, it is important to note that: 1) most of the potential impacts will be temporary (i.e., soils will only be exposed or impacted for a short period of time during construction); and 2) Equitrans will implement the FERC Plan and Procedures to properly restore the temporarily disturbed soils as part of the construction process.

7.2.1 Central Allegheny Plateau Major Land Resource Area

Soil interpretations at the broadest scale in the United States are based on Major Land Resource Areas (MLRAs). MLRAs are geographically associated land resource units, usually encompassing several thousand square miles, characterized by a particular pattern of soils, geology, climate, water resources, and land use (Soil Survey Staff 2006). MLRAs are a useful tool for describing the general soils crossed by the proposed pipeline and the natural and anthropomorphic features affecting those soils.

The proposed pipelines and aboveground Project facilities are located in the Central Allegheny Plateau MLRA (Soil Survey Staff 2006). The Central Allegheny Plateau MLRA stretches approximately 18,040 square miles (46,750 square kilometers) across portions of West Virginia (49 percent), Ohio (28 percent), Pennsylvania (22 percent), and Kentucky (1 percent) (Soil Survey Staff 2006). The cities of Huntington, Charleston, Parkersburg, Clarksburg, Fairmont, Morgantown, and Wheeling, West Virginia; and Pittsburgh, Uniontown, and Indiana, Pennsylvania, are in this MLRA. Steubenville, Marietta, and Athens, Ohio, also are located in this MLRA.

The Central Allegheny Plateau is a dissected plateau that is underlain mainly by horizontally bedded sedimentary rocks. The characteristic narrow, level valleys and narrow, sloping ridgetops are separated by long, steep and very steep side slopes. Elevation throughout the Central Allegheny Plateau generally range from 650 feet on the lowest valley floors to 1,310 feet or more on the highest ridgetops. Local relief is approximately 330 feet.

The major Hydrologic Unit Areas, or watersheds, that make up this MLRA are identified here in percentages: Upper Ohio, 48 percent; Monongahela, 19 percent; Kanawha, 10 percent; Muskingum, 9 percent; Middle Ohio, 6 percent; Allegheny, 5 percent; and Big Sandy-Guyandotte, 3 percent.

Precipitation in the Central Allegheny Plateau MLRA is unevenly distributed throughout the year. Maximum precipitation generally occurs in midsummer, and the minimum occurs in autumn and early winter. Most rainfall occurs during high-intensity, convective thunderstorms in summer. The freeze-free period averages 190 days.

The dominant soil orders in the Central Allegheny Plateau MLRA are Alfisols, Ultisols, and Inceptisols. The soils in the area have a mesic soil temperature regime, an udic soil moisture regime, and mixed mineralogy. They are generally shallow to very deep, excessively drained to somewhat poorly drained, and skeletal to clayey. Dystrudepts (Dekalb and Hazleton series) formed in sandstone residuum that caps the ridges. Hapludults (Wharton series) formed on the broader summits. Hapludalfs (Culleoka, Dormont,

Lowell, Peabody, Upshur, and Westmoreland series), Hapludults (Gilpin series), and Dystrudepts (Weikert series) formed on the hillsides of red shale, limestone, calcareous shale, and acid shale. The Dystrudepts on these hillsides are less extensive than the Hapludalfs and Hapludults. Hapludalfs (Guernsey, Vandalia, and Beech series) formed in colluvium on footslopes. Fragiudults (Monongahela series), Dystrudepts (Philo series), Endoaquepts (Newark series), and Eutrudepts (Chagrin and Sensabaugh series) formed in alluvium along the major streams. Udorthents (Bethesda, Fairpoint, and Morristown series) formed in material derived from the surface mining of coal.

Most of the Central Allegheny Plateau MLRA consists of farms, but less than one-half of the MLRA consists of income-producing farms. Farm income is predominantly from beef cattle operations and dairy farms associated with hay, grassland, and cultivated crops. More than one-half of the area is forested, and the production of timber is important in some areas. Urban expansion, including industrial and residential development, is increasing along the Ohio River and its major tributaries. Much of the cropland has been converted to urban uses. In addition, large acreages are owned or leased for surface mining of coal.

The major soil resource concerns in the Central Allegheny Plateau MLRA are sheet and rill erosion on pasture, land slippage, subsidence resulting from mining, stream bank erosion, gullying, surface compaction caused by livestock trampling, and a reduced content of organic matter on cropland. Conservation practices on cropland generally include crop rotations, contour farming, nutrient management, grassed and forested riparian buffers, cover crops, hayland planting, diversions, and grassed waterways. Conservation practices for pasture land typically include rotational grazing, watering systems, fencing, managed livestock access to streams, pasture planting, and nutrient management. Forest management conservation practices include forest harvest trails, critical area planting, and water bars on trails.

7.2.2 Soil Types Crossed by Proposed Pipeline Facilities

A total of 39 soil types (i.e., soil map units) are crossed by the proposed pipeline routes (comprising 24 soil series). The proposed 2.99-mile-long H-316 pipeline crosses 16 soil map units in Greene County, Pennsylvania and the proposed 4.26-mile-long H-318 pipeline crosses 26 soil map units in Washington and Allegheny Counties, Pennsylvania. The 0.04-mile-long pipeline corridor for the proposed H-319 pipeline crosses one soil map unit. The 0.24-mile-long combined pipeline corridor for the H-158/M-80 pipelines crosses five soil map units. The 0.10 mile proposed H-305 pipeline crosses three soil map units. These soil map units are listed and described in Appendix 7-A.

7.2.3 Soil Types Underlain by Proposed Aboveground Facilities

The proposed aboveground facilities are underlain by a total of 10 soil map units (comprising nine soil series). The proposed 17.75-acre Redhook Compressor Station includes six soil map units in Greene County, Pennsylvania, which is near the existing Pratt Compressor Station. That existing station currently occupies 7.67 acres and three map units. The Webster Interconnect will encompass 2.47 acres in Wetzel County, West Virginia, including two soil map units. The Mobley Tap Site, Applegate Launcher/Receiver (L/R) Site, Hartson L/R Site, and the H-302 Tap L/R Site will encompass 0.50, 0.39, 0.11, and 0.33 acres, respectively, and each contains one separate soil series. The soil map units that underlie the proposed aboveground facilities are listed in Appendix 7-B.

The two compressor stations are each larger than 5 acres. The proposed Redhook Compressor Station has a total of 17.75 acres of soils that are designated as farmland soils—5.50 acres are listed as Prime Farmland and 9.08 acres are listed as Farmland of Statewide Importance. Currently, the land use at the proposed

Redhook Compressor Station is not active farming. Although approximately 6 acres are mapped as farmland soil at the Pratt Compressor Station (5.96 acres of Prime Farmland and 0.1 acre of Farmland of Statewide Significance), this site was constructed in the 1950s, and the soils there were permanently impacted during its construction. The proposed Webster Interconnect includes 2.46 acres of Farmland of Statewide Importance; there are no soils listed as Prime Farmland. The proposed Mobley Tap Site includes 0.50 acre of Farmland of Statewide Importance and the Applegate L/R Site includes 0.39 acre of Prime Farmland. The Hartson L/R Site and the H-302 Tap L/R Site do not include Prime Farmland, and current land use does not include active farming at these sites.

7.3 GENERAL IMPACTS AND MITIGATION

This section discusses various soil attributes, special designations, and limiting characteristics relevant to construction of the Project; and also includes the general ways that Equitrans plans to avoid, minimize, and mitigate potential impacts.

Table 7.3-1 summarizes the special designations and limiting characteristics of soils affected by the Project (in acres), including slope, designated farmland, hydric soils, soils that are highly erodible due to water or wind, soils prone to compaction, and soils that may have poor revegetation. Table 7.3-1 includes major Project components, totaling 199 acres.

The soils crossed by the Project do not pose any severe limitations for construction, and Equitrans' best management practices will avoid or minimize soil impacts and mitigate limiting soil characteristics. Equitrans is committed to following best management practices, and at a minimum, will implement soil mitigation measures outlined in the FERC Plan and Procedures.

The FERC Plan and Procedures address project planning, construction, and right-of-way restoration. Additional Project-specific measures for minimizing soil impacts may also be followed as a result of other federal, state, and local permits and consultation and will be identified when final permits and plans are developed. Project-specific mitigation measures and controls will be developed for the Project prior to construction and will include erosion and sediment control plans and construction alignment sheets or drawings. As described in Resource Report 1, Equitrans will provide environmental training to the contractors and will employ environmental inspectors to direct and monitor the implementation of best management practices as specified in Project environmental plans and permits. Should hazardous materials or contaminated soils and/or sediments be encountered during construction, they would be disposed of at fully licensed and permitted disposal facilities in accordance with applicable state and federal laws and regulations.

Furthermore, only a small portion of the total area disturbed during construction will be needed for operations of the various aboveground facilities—most areas along the proposed pipelines and around smaller aboveground facilities will be revegetated or otherwise restored.

Table 7.3-1

Characteristics of Soils Affected by the Project

Facility a/	County	Total Area (acres)	Slopes ≥15 percent b/ (acres)	Designated Farmland c/		Hydric Soils d/ (acres)	Stony/ Rocky Soils d/ (acres)	Poor Drainage Potential d/ (acres)	Soils Prone to Erosion		Soils Prone to Soil Compaction g/ (acres)	Poor Revegetation Potential h/ (acres)
				Prime (acres)	Statewide Importance (acres)				By Water e/ (acres)	By Wind f/ (acres)		
H-305 Pipeline	Greene/PA	2.77	1.29	0.02	1.28	0	0	0	2.57	0	2.59	2.75
H-316 Pipeline	Greene/PA	58.90	14.56	8.27	10.54	0.66	0.07	0.63	23.18	0	25.49	48.01
H-318 Pipeline	Allegheny, Washington/PA	97.63	15.33	12.83	27.08	0.49	0	0.54	46.32	0	58.74	78.42
H-319 Pipeline	Wetzel/WV	0.84	0	0	0.84	0.03	0.84	0	0	0	0	0
H-158/M-80 Pipelines	Greene/PA	9.91	3.16	1.84	2.51	0	0	0	0.83	0	4.09	8.17
Pratt Compressor Station	Greene/PA	7.67	1.61	5.96	0.10	0.30	0	0	1.61	0	6.06	1.71
Redhook Compressor Station	Greene/PA	17.74	1.82	8.58	6.00	0	0	0	7.82	0	11.64	9.16
Webster Interconnect	Wetzel/WV	2.47	0.02	0	2.46	0.07	2.46	0	0.02	0	0	0.02
Mobley Tap Site	Wetzel/WV	0.50	0	0	0.50	0.02	0.49	0	0	0	0	0
Applegate L/R Site	Allegheny/PA	0.39	0	0.39	0	0	0	0	0.39	0	0.39	0
Hartson L/R Site	Washington/PA	0.11	0.11	0	0	0	0	0	0.11	0	0.11	0.11
H-302 Tap L/R Site	Greene/PA	0.33	0	0	0	0	0	0	0	0	0	0
Total Acres		**199.26**	**37.9**	**37.89**	**51.31**	**1.57**	**3.86**	**1.17**	**82.85**	**0**	**109.11**	**148.35**
Percent of Total Acres			**19%**	**19%**	**26%**	**<0.01%**	**2%**	**<0.01%**	**42%**	**0%**	**55%**	**74%**

Note: The values in each row do not necessarily add up to the total acreage for each facility, because of minor rounding or mapping inconsistencies.
a/ The list of facilities does not include additional temporary workspaces, contractor yard, or staging areas.
b/ Soils characterized by the NRCS as having representative slopes of 15 percent or greater.
c/ As designated by the NRCS.
d/ As designated by the NRCS.
e/ Based on K factor for the whole soil (Kw), the representative slope, and the nonirrigated land capability rating; a Kw rating of "moderate" was elevated to "high" when associated with steep slopes and when the Nonirrigated Capability Subclass included an "e," which indicates that erosion is a potential hazard for the soil type.
f/ Based on the Wind Erodibility Group scale; soils with a rating of 1 to 4 were ranked with a high potential for erosion due to wind.
g/ Based on 1) soils with poor drainage (somewhat poorly drained to poorly drained), 2) a high clay content (greater than 20 percent), or 3) a surface soil texture characterized as sandy clay loam or dominated by finer particles.
h/ Based on soils 1) that have a surface texture of sandy loam or coarser, 2) are somewhat excessively drained to excessively drained, 3) have slopes greater than 15 percent, or 4) have severe limitations (i.e., a Nonirrigated Capability Class of 3 or higher).
Sources: Soil Survey Staff 2015a, 2015b

7.3.1 Topographic Setting and Representative Slope

The Project facilities are located in the Central Allegheny Plateau MLRA. Typical of the Central Allegheny Plateau MLRA, facilities are located among a mix of landforms including floodplains, stream terraces, upland terraces, hillslopes, hills, and plateaus.

Slopes range from slight to moderate to steep and very steep. An analysis of the total Project area found that 37.90 acres (19 percent) are located on soils with slopes rated steep or very steep (15 percent slopes or greater). Most of this total (32 acres) is associated with the pipelines. Table 7.3-1 lists the acreages of steep and very steep slopes for each of the Project facilities.

The Pratt Compressor Station is an existing facility, so the site has been graded and stabilized. The other proposed aboveground facilities are on sites that may have slopes, but site grading and stabilization is expected to address any potential long-term slope issues of these sites.

Steep slopes can increase susceptibility to erosion by water and can potentially make revegetation more difficult by increasing potential soil erosion, affecting available sunlight, etc. Steep slopes may also have shallower or rockier soils that can reduce or limit soil productivity and revegetation or may be more prone to slipping or slope failure.

There are several ways to mitigate for steep slopes during construction, such as installing temporary slope breakers, trench breakers, silt fence, compost filter sock, and other erosion control devices (ECDs), to reduce potential erosion, direct water off the right-of-way, and prevent the transport of sediment down the slope or off the right-of-way. During restoration, permanent slope breakers or erosion control blankets can be installed to reduce potential erosion. Alternate seeding methods (e.g., hydroseeding) can be used if mechanical seeding equipment cannot access steep slopes. Equitrans will follow these and other measures discussed in the FERC's Plan as well as its state earth disturbance permits during construction and restoration.

As discussed in Section 7.3.6, Equitrans will monitor revegetation success for at least two growing seasons and take action where revegetation is not acceptable (e.g., re-seeding, soil testing). This monitoring will include soil erosion onto agricultural areas until the establishment of revegetation.

Equitrans has routed the Project pipelines to avoid "side-hill" construction; the pipeline centerline follows ridgelines to allow for safe pipeline construction and to prevent slips.

Large expanses of bedrock are not expected to be encountered during trenching operations; subsoils in the Project area are typically readily broken without blasting. Shallow depth to bedrock is discussed in Resource Report 6, Section 6.2.1, and Table 6.2-1. The small area of stony/rocky soils, 3.86 acres (2 percent), is not seen as disadvantageous as the majority of the stony/rocky soils are found at the Webster Interconnect and the Mobley Tap Site. Spoils will be placed on the level construction right-of-way or in designated additional temporary work spaces. In the absence of level ground, sediment barriers or similarly protective devices will be installed to retain stockpiles within the designated construction workspace. Where ground seeps are encountered during construction, a ground seep collection best management practice (e.g., rock-lined trench or underdrain) may be installed to manage the movement of water across the worksite. After installation of the pipe, the trench will be compacted, and the right-of-way will be returned to original grade. Permanent waterbars will be installed following state spacing requirements to direct water off the right-of-way after construction is complete. Seed and mulch for temporary and

permanent vegetation will be applied as soon as is practicable and in compliance with FERC and state guidelines.

Equitrans does not propose any variance from the FERC's Plan V.A.5. All areas are expected to be returned to pre-construction contours.

Typical cross-section diagrams are provided in Appendix 1-E of Resource Report 1. Restoration practices are consistent with Project earth disturbance permits, and generally include the use of rolled or hydraulically applied erosion control fabric on slopes 3:1 or steeper.

7.3.2 Prime Farmland and Farmland of Statewide Importance

The Project includes a total of 89.20 acres (45 percent) of soil designated as Prime Farmland or Farmland of Statewide Importance. Approximately 38 acres are designated as Prime Farmland and 51 acres are listed as Farmland of Statewide Importance. Table 7.3-1 lists the acreages of Prime Farmland and Farmland of Statewide Significance for each of the Project facilities.

Much of the designated farmland is located along the pipeline routes, which will be restored and available for agricultural use once the pipeline trench is backfilled; therefore, no significant or permanent impacts on these farmland soils are anticipated.

Approximately 6 acres are mapped as farmland soil at the Pratt Compressor Station. However, this site was constructed in the 1950's and the soils there were permanently impacted during its construction. The proposed Redhook Compressor Station, Webster Interconnect, Mobley Tap Site, Applegate L/R Site, Hartson L/R Site, and the H-302 Tap L/R Site will include approximately 18 acres of farmland soil, effectively removing this acreage from possible agricultural production. However, current land use at these sites does not include active farming.

Equitrans will follow the FERC Plan to mitigate potential temporary impacts on farmland soils, conserve agriculturally important soils during construction, and ensure that agricultural productivity is successfully restored. This includes segregating topsoil from subsoil in agricultural and residential areas up to a depth of 12 inches. Where topsoil is less than 12 inches deep, the actual depth of the topsoil will be removed and segregated. Equitrans will also conserve topsoil in residential areas and at waterbody and wetland crossings. The topsoil will be segregated from subsoil to minimize potential mixing with subsoil and rocks and to help with subsequent restoration. During construction, the segregated topsoil will be stockpiled in separate windrows along the construction right-of-way and temporarily seeded and stabilized (e.g., with mulch and ECDs where necessary) to help prevent topsoil loss due to water or wind erosion. The temporary stabilization of soils will be achieved by applying a temporary seed cover and mulch, as specified in Project state earth disturbance permits. Topsoil will not be used for filling the trench.

During restoration, the topsoil will be restored. In addition, the soil will be decompacted and fertilizer and lime will be added, where necessary and in coordination with landowners and local natural resource agencies, to help ensure the successful restoration and agricultural productivity of the soils. Equitrans will also take steps to compensate landowners for the temporary loss of agricultural lands during construction.

7.3.3 Hydric Soils

Almost no hydric soils will be crossed by the Project. A review of hydric soils found that only 1.57 acres of hydric soil (less than 0.01 percent of the Project total) may be crossed, and impacts to these soil types

may be avoided as Equitrans has proposed to cross the Monongahela River and the South Fork Tenmile Creek via horizontal directional drilling (HDD). Table 7.3-1 lists the acreages of hydric soils for each of the Project facilities. Several of the soil types (totaling 10.97 acres) were noted for occasional or frequent flooding, and approximately 6 acres of this total is at the existing Pratt Compressor Station.

It should be noted that these data are based on soil mapping units from the NRCS, which do not capture or describe small inclusions of soils, such as smaller wetland crossings. Anticipated field surveys may find hydric soils not included in the NRCS data.

Due to extended periods of saturation, hydric soils and poor drainage potential soils are susceptible to compaction and rutting. Equitrans will take proactive measures in wetland and poor drainage potential soils to minimize compaction and rutting, typically by installing temporary equipment mats to allow passage of equipment with minimal disturbance of the surface and vegetation. Minimal impact on soil resources it is expected as a result of following these measures and the FERC Plan and Procedures. Construction in wetlands will follow the measures included in the FERC Procedures, as further described in Resource Report 2.

Surface and subsurface drainage systems (e.g., drain tiles) may exist, particularly in areas with hydric soils. Pipeline construction could disrupt these drainage systems; therefore, to avoid or minimize this impact, Equitrans will question landowners and local agricultural agency personnel regarding the potential presence of drain tiles and irrigation systems in affected agricultural fields. Should drainage tiles or irrigation piping be damaged during construction, Equitrans will repair or restore their function.

7.3.4 Potential for Soil Contamination

Soil contamination along the route may result from at least two sources: material spills during construction and trench excavation through pre-existing contaminated areas, as discussed in Resource Report 6. Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of contamination are typically minor because of the low frequency and volumes of spills and leaks.

Equitrans is developing a Spill Prevention, Control, and Countermeasure Plan (SPCC Plan) that specifies cleanup procedures in the event of soil contamination from spills or leaks of fuel, lubricants, coolants, or solvents. Equitrans and its contractors will use the SPCC Plan to prevent and contain, if necessary, accidental spills of any material that may contaminate soils and to ensure that inadvertent spills of fuels, lubricants, or solvents are contained, cleaned up, and disposed of in an appropriate manner.

If contaminated or suspect soils (e.g., oil-stained soils) are identified during trenching operations, Equitrans' plan to address the contamination is as follows: the construction contractor will notify Equitrans, and work in the area of the suspected contamination will be halted until the type and extent of the contamination is determined. Equitrans will notify all applicable agencies of the discovered material. The response action will be identified based on the type and extent of contamination; the responsible party; and local, state, and federal regulations, depending on the type of contamination.

7.3.5 Soil Erosion Due to Water or Wind

Soil erosion and sedimentation are two of the primary limitations and potential impacts on soil resources from pipeline construction. An analysis of the NRCS rankings of soil erosion susceptibility identified

82.55 acres (42 percent) of the Project area that may be highly susceptible to erosion due to water, but no soils that are highly susceptible to wind erosion. Table 7.3-1 lists the acreages of highly erodible soils due to water and wind for each of the Project facilities.

The majority of the soils along the H-305, H-316, and H-318 pipelines are highly susceptible to erosion, but less than 10 percent of the soils along the H-158 and M-80 pipelines, and none of the soils along the H-319 pipeline are considered susceptible to erosion. The existing Pratt Compressor Station has 21 percent of soils that are considered at risk for erosion, while 44 percent of the soils at the proposed Redhook Compressor Station are considered at risk for erosion. The Webster Interconnect, Mobley Tap Site, Applegate L/R Site, Hartson L/R Site, and the H-302 Tap L/R Site are not considered susceptible to erosion.

Removal of vegetation and disturbance of the soil by construction activities can increase erosion potential and, without adequate protection, may result in the transport of sediment off the approved right-of-way limits or into waterbodies and wetlands. Soil loss due to erosion can also reduce soil fertility and impair revegetation.

Any impacts created during construction are expected to be temporary and will be actively mitigated during construction and restoration. Equitrans will implement a variety of measures to mitigate the risks of erosion, and will act proactively to control sedimentation.

Equitrans will follow accepted best management practices to prevent or minimize both soil erosion and the transport and deposition of eroded soil off the right-of-way or into wetlands, waterbodies, and other sensitive resources. Equitrans' plans and efforts will also be designed to minimize or mitigate impacts and to ensure the acceptably restoration of the right-of-way to conditions similar to pre-construction conditions. Equitrans will take appropriate actions to correct identified problems as necessary. Equitrans will accomplish this by performing all construction and restoration activities in compliance with the FERC Plan and Procedures and in accordance with state and local permit requirements. In addition, Equitrans will implement best management practices included in the Project's Erosion and Sedimentation Control Plan (E&SCP). This includes the installation and maintenance of temporary and permanent erosion and sediment controls to help prevent erosion and control sedimentation (e.g., compost filter sock, silt fence, slope breakers, rock-lined construction entrances), stabilizing disturbed soils with seed and mulch to minimize erosion, and wetting roads to minimize dust.

Although portions of the proposed aboveground facilities are underlain by soils that are potentially erodible, Equitrans will take steps to minimize potential erosion and sedimentation. Erosion control devices will be installed around the site perimeter before ground-disturbing activities begin. Site grading and temporary stabilization will begin almost immediately after the start of construction, and spoils will be properly managed in accordance with the FERC Plan and Procedures and the E&SCP. Stormwater management systems may also be developed for the sites, which may include temporary and/or permanent measures to control stormwater and sediment during construction and operations.

Equitrans will also implement specific measures to avoid significant adverse impacts on wetland soils. Wetland and waterbody crossings will follow applicable state regulations and guidelines, as well as the FERC's Procedures, which includes using equipment mats and segregating topsoil to help protect and restore sensitive resources. Resource Report 2, Water Use and Quality, discusses wetland and waterbody crossings in more detail.

Equitrans will make best efforts to ensure the rapid, successful establishment of vegetation on areas requiring revegetation, which will generally include all areas disturbed by construction with the exception of agricultural lands where requested otherwise by the landowner. Following final grading and cleanup, Equitrans will condition the construction workspace for planting, including the preparation of a seedbed and application and incorporation of soil amendments at rates specified by state regulations or agreed to by the landowner. Equitrans will seed areas to be revegetated in accordance with written recommendations for seed mixes, rates, and dates obtained from the appropriate soil conservation authorities or as requested by landowners.

Except in active agricultural areas and some residential areas, temporary erosion control devices will be maintained until the right-of-way is successfully revegetated. Following successful revegetation of construction areas, temporary erosion control devices will be removed.

During construction and right-of-way restoration and revegetation, the effectiveness of temporary ECDs will be monitored by one or more Environmental Inspectors hired by Equitrans. ECDs will be maintained as necessary while in use.

Although not anticipated, Equitrans has developed a Winterization Plan (see Appendix 1-J of Resource Report 1) if construction and adequate revegetation and stabilization are not completed in time for the winter.

Equitrans will consult with the appropriate county conservation district to develop a restoration plan that addresses seed mixes and application rates for fertilizer and lime.

7.3.6 Soil Compaction

Soils may be prone to soil compaction caused by the repeated movement and pressure of machinery across the soil surface. There are no direct measures of soil compaction, and the NRCS does not provide any direct interpretive categories that rate soil compaction risk. Therefore, the potential risk was evaluated based on the presence of one or more soil attributes. However, these are not directly related, and the risk of soil compaction can vary significantly depending on soil moisture content and efforts taken to mitigate potential risks. Based on an analysis of available indicators, approximately 109 acres (55 percent) of the soils in the Project are potentially prone to soil compaction. Table 7.3-1 lists the acreages of soils that may be prone to compaction for each of the Project facilities.

Most soils crossed by the Project are at least somewhat susceptible. Therefore, Equitrans will conduct full right-of-way top soil segregation as a means to mitigate the potential for soil compaction during construction.

Equitrans will adhere to the specific soil compaction mitigation conditions in the FERC's Plan. This includes using equipment mats and wide tires or tracks that disperse equipment weight, monitoring soil compaction (visible rutting), and tilling to decompact soil as part of final restoration – particularly in agricultural and residential areas.

In order to minimize compaction, Equitrans will also limit construction traffic within the pipeline construction right-of-way to only that required to accomplish the construction.

Since impacts related to mechanical compaction are expected to be limited to the upper soil horizon or the contact between the upper horizons, tilling is expected to effectively mitigate the impact. If tilling is not

effective, Equitrans will identify mechanical (such as deep tilling) or other methods to restore the area. Equitrans will consider decompaction complete after tilling and the replacement of top soil.

7.3.7 Poor Revegetation Potential

Most soils crossed by the Project have some attribute that may indicate potential challenges to revegetation. Such attributes include steep slopes, a surface texture of sandy loam or coarser, rapid drainage, or some other limitation (i.e., slope, acidity, salinity). Overall, 148 acres (74 percent) of the soils associated with the Project have one or more indicators of possible revegetation issues. Table 7.3-1 lists the acreages of soils that may have poor revegetation potential for each of the Project facilities.

Equitrans will follow the guidelines in the FERC Plan and Procedures to help ensure adequate and acceptable revegetation of temporarily disturbed areas, which, among other methods, may include the addition of fertilizers and/or lime, where appropriate, or use of erosion control blankets or mulch to help stabilize the ground while seed germinates. Equitrans will monitor revegetation success for at least two growing seasons and take action where revegetation is not acceptable (e.g., re-seeding, soil testing). Equitrans will conduct soil testing along the pipeline right-of-way within every change in land cover or land use and develop an amendment and seeding plan based on results of soil fertility tests, which will be incorporated into the earth disturbance permits. If post-construction grading is completed after the end of the growing season, the area will be mulched, and seeding will take place during the next growing season. If necessary, a winterization plan will be implemented to address restoration and revegetation measures if seeding could not be completed before the onset of winter. Unless requested by a landowner, areas will be seeded by the next available seeding season. Post-construction inspections will be conducted in accordance with the FERC Plan and Procedures as well as applicable state regulations and guidelines to ensure that revegetation is adequate.

Other areas, particularly within aboveground facilities or at road crossings, etc. may be repaved or stabilized with gravel, rather than revegetated.

7.4 AGENCY CONSULTATION

Equitrans has consulted with other federal, state, and local agencies in pre-application meetings regarding permits, erosion and sediment control, stormwater runoff, seeding and restoration, and other soil conservation issues. Equitrans will document these consultations as part of its filings to FERC.

7.5 REFERENCES

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Equitrans Expansion Project

Docket No. CP16-__-000

Resource Report 7

Appendix 7-A
Soil Map Units by Milepost

Appendix 7-A Soil Map Units by Milepost				
Milepost Start	**Milepost End**	**Map Unit Symbol**	**Map Unit Name**	**Distance Crossed (miles)**
H-305 Pipeline				
0.00	0.00	GdB	Guernsey silt loam, 3 to 8 percent slopes	0.00
0.00	0.09	DoC	Dormont silt loam, 8 to 15 percent slopes	0.09
0.09	0.10	DtD	Dunmore channery silt loam, 15 to 25 percent slopes	0.01
H-316 Pipeline				
0.00	0.00	DoC	Dormont silt loam, 8 to 15 percent slopes	0.00
0.00	0.05	GdB	Guernsey silt loam, 3 to 8 percent slopes	0.04
0.05	0.06	DaB	Dekalb channery loam, 3 to 8 percent slopes	0.01
0.06	0.11	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.05
0.11	0.15	Du	Dunning silt loam	0.04
0.15	0.20	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.05
0.20	0.24	DtD	Dunmore channery silt loam, 15 to 25 percent slopes	0.04
0.24	0.27	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.03
0.27	0.48	DtD	Dunmore channery silt loam, 15 to 25 percent slopes	0.22
0.48	0.51	WeB	Westmoreland silt loam, 3 to 8 percent slopes	0.03
0.51	0.64	DtD	Dunmore channery silt loam, 15 to 25 percent slopes	0.12
0.64	0.91	DoC	Dormont silt loam, 8 to 15 percent slopes	0.27
0.91	0.97	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.06
0.97	1.02	UdB	Udorthents, smoothed, gently sloping	0.04
1.02	1.10	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.09
1.10	1.20	DaB	Dekalb channery loam, 3 to 8 percent slopes	0.10
1.20	1.23	DaC	Dekalb channery loam, 8 to 15 percent slopes	0.03
1.23	1.27	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.04
1.27	1.33	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.07
1.33	1.34	W	Water	0.01
1.34	1.35	Nw	Newark silt loam	0.01
1.35	1.39	GdB	Guernsey silt loam, 3 to 8 percent slopes	0.04
1.39	1.45	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.06
1.45	1.49	DaC	Dekalb channery loam, 8 to 15 percent slopes	0.04
1.49	1.56	DaF	Dekalb channery loam, 35 to 65 percent slopes	0.07
1.56	1.61	AgB	Allegheny silt loam, 3 to 8 percent slopes	0.05
1.61	1.64	AgC	Allegheny silt loam, 8 to 15 percent slopes	0.02
1.64	1.67	DaF	Dekalb channery loam, 35 to 65 percent slopes	0.04
1.67	1.71	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.04
1.71	1.74	AgC	Allegheny silt loam, 8 to 15 percent slopes	0.03
1.74	1.80	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.05
1.80	1.82	DaC	Dekalb channery loam, 8 to 15 percent slopes	0.02

Appendix 7-A Soil Map Units by Milepost				
Milepost Start	**Milepost End**	**Map Unit Symbol**	**Map Unit Name**	**Distance Crossed (miles)**
1.82	1.85	DaF	Dekalb channery loam, 35 to 65 percent slopes	0.03
1.85	1.97	AgB	Allegheny silt loam, 3 to 8 percent slopes	0.12
1.97	2.05	DaB	Dekalb channery loam, 3 to 8 percent slopes	0.08
2.05	2.08	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.03
2.08	2.14	GdB	Guernsey silt loam, 3 to 8 percent slopes	0.05
2.14	2.18	WeD	Westmoreland silt loam, 15 to 25 percent slopes	0.04
2.18	2.26	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.08
2.26	2.28	W	Water	0.02
2.28	2.38	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.10
2.38	2.46	DoC	Dormont silt loam, 8 to 15 percent slopes	0.08
2.46	2.56	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.10
2.56	2.58	DtD	Dunmore channery silt loam, 15 to 25 percent slopes	0.01
2.58	2.61	BoB	Brooke silty clay loam, 3 to 8 percent slopes	0.04
H-318 Pipeline				
0.00	0.07	GuB	Guernsey silt loam, 3 to 8 percent slopes	0.07
0.07	0.12	CuD	Culleoka-Dormont-Urban land complex, 15 to 25 percent slopes	0.05
0.12	0.22	GuC	Guernsey silt loam, 8 to 15 percent slopes	0.10
0.22	0.23	CuD	Culleoka-Dormont-Urban land complex, 15 to 25 percent slopes	0.00
0.23	0.29	GuD	Guernsey silt loam, 15 to 25 percent slopes	0.06
0.29	0.36	CuD	Culleoka-Dormont-Urban land complex, 15 to 25 percent slopes	0.07
0.36	0.61	GuC	Guernsey silt loam, 8 to 15 percent slopes	0.25
0.61	0.70	GuD	Guernsey silt loam, 15 to 25 percent slopes	0.09
0.70	0.75	GuC	Guernsey silt loam, 8 to 15 percent slopes	0.05
0.75	0.80	GSF	Gilpin, Weikert, and Culleoka shaly silt loams, very steep	0.05
0.80	0.91	GuC	Guernsey silt loam, 8 to 15 percent slopes	0.11
0.91	1.02	CuD	Culleoka-Dormont-Urban land complex, 15 to 25 percent slopes	0.11
1.02	1.09	GSF	Gilpin, Weikert, and Culleoka shaly silt loams, very steep	0.07
1.09	1.17	DoC	Dormont silt loam, 8 to 15 percent slopes	0.08
1.17	1.23	CuD	Culleoka-Dormont-Urban land complex, 15 to 25 percent slopes	0.06
1.23	1.29	DoC	Dormont silt loam, 8 to 15 percent slopes	0.05
1.29	1.34	CwD	Culleoka-Westmoreland silt loams, 15 to 25 percent slopes	0.06
1.34	1.38	DoB	Dormont silt loam, 3 to 8 percent slopes	0.04
1.38	1.43	DoD	Dormont silt loam, 15 to 25 percent slopes	0.04
1.43	1.52	DoB	Dormont silt loam, 3 to 8 percent slopes	0.10
1.52	1.56	DoC	Dormont silt loam, 8 to 15 percent slopes	0.04
1.56	1.61	DoD	Dormont silt loam, 15 to 25 percent slopes	0.05
1.61	1.68	DoE	Dormont silt loam, 25 to 35 percent slopes	0.07

Appendix 7-A

Soil Map Units by Milepost

Milepost Start	Milepost End	Map Unit Symbol	Map Unit Name	Distance Crossed (miles)
1.68	1.75	GSF	Gilpin, Weikert, and Culleoka shaly silt loams, very steep	0.07
1.75	1.81	SmF	Strip mines, 25 to 75 percent slopes	0.06
1.81	1.90	CwC	Culleoka-Westmoreland silt loams, 8 to 15 percent slopes	0.08
1.90	2.00	RaB	Rayne silt loam, 3 to 8 percent slopes	0.10
2.00	2.17	AgB	Allegheny silt loam, 3 to 8 percent slopes	0.17
2.17	2.20	SmF	Strip mines, 25 to 75 percent slopes	0.03
2.20	2.27	RaB	Rayne silt loam, 3 to 8 percent slopes	0.07
2.27	2.37	SmF	Strip mines, 25 to 75 percent slopes	0.10
2.37	2.64	SmD	Strip mines, 8 to 25 percent slopes	0.26
2.64	2.68	SmF	Strip mines, 25 to 75 percent slopes	0.04
2.68	2.75	GQF	Gilpin-Upshur complex, very steep	0.07
2.75	2.80	RaB	Rayne silt loam, 3 to 8 percent slopes	0.05
2.80	2.81	GQF	Gilpin-Upshur complex, very steep	0.01
2.81	2.85	URB	Urban land-Rainsboro complex, gently sloping	0.05
2.85	2.89	RaB	Rayne silt loam, 3 to 8 percent slopes	0.04
2.89	2.95	RaA	Rainsboro silt loam, 0 to 3 percent slopes	0.06
2.95	3.12	W	Water	0.17
3.12	3.21	Us	Udorthents, smoothed	0.09
3.21	3.25	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.04
3.25	3.36	CaC	Calvin silt loam, 8 to 15 percent slopes	0.11
3.36	3.49	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.13
3.49	3.62	DoC	Dormont silt loam, 8 to 15 percent slopes	0.13
3.62	3.65	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.03
3.65	3.71	WeB	Westmoreland silt loam, 3 to 8 percent slopes	0.06
3.71	3.73	WeC	Westmoreland silt loam, 8 to 15 percent slopes	0.02
3.73	3.76	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.03
3.76	3.77	CaC	Calvin silt loam, 8 to 15 percent slopes	0.01
3.77	3.83	DoC	Dormont silt loam, 8 to 15 percent slopes	0.06
3.83	3.83	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.00
3.83	3.89	CaC	Calvin silt loam, 8 to 15 percent slopes	0.06
3.89	3.90	CaD	Calvin silt loam, 15 to 25 percent slopes	0.02
3.90	3.95	DoC	Dormont silt loam, 8 to 15 percent slopes	0.05
3.95	4.01	CaD	Calvin silt loam, 15 to 25 percent slopes	0.06
4.01	4.08	CaB	Calvin silt loam, 3 to 8 percent slopes	0.07
4.08	4.20	CaD	Calvin silt loam, 15 to 25 percent slopes	0.12
4.20	4.25	Fa	Fairplay (marl) silt loam	0.05
4.25	4.26	WeD	Westmoreland silt loam, 15 to 25 percent slopes	0.02

Appendix 7-A Soil Map Units by Milepost				
Milepost Start	**Milepost End**	**Map Unit Symbol**	**Map Unit Name**	**Distance Crossed (miles)**
H-319 Pipeline				
0.00	0.04	Sk	Skidmore gravelly loam	0.04
H-158/M-80 Pipelines				
0.00	0.03	CaD	Calvin silt loam, 15 to 25 percent slopes	0.03
0.03	0.06	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.03
0.06	0.09	Nw	Newark silt loam	0.03
0.09	0.13	DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.04
0.13	0.18	DaD	Dekalb channery loam, 15 to 25 percent slopes	0.05
0.18	0.24	DaB	Dekalb channery loam, 3 to 8 percent slopes	0.06
Sources: Soil Survey Staff 2015a, 2015b				

Equitrans Expansion Project

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Resource Report 7

Appendix 7-B
Soil Map Units at Aboveground Facilities

Appendix 7-B Soil Map Units at Aboveground Facilities						
Soil Map Unit Symbol	**Soil Map Unit Name**	**Anticipated Temporary Impact**		**Anticipated Permanent Impact a/**		**Designated Farmland**
		Acres	**Percent of Site**	**Acres**	**Percent of Site**	
Pratt Compressor Station						
DaD	Dekalb channery loam, 15 to 25 percent slopes	1.61	21	TBD	TBD	Not Prime Farmland
Hu	Huntington silt loam	5.96	78	TBD	TBD	Prime Farmland
Nw	Newark silt loam	0.10	1	TBD	TBD	Farmland of Statewide Importance
W	Water	0.01	<0.01	TBD	TBD	-
	Pratt CS Total (acres)	**7.68**				
Redhook Compressor Station						
DaB	Dekalb channery loam, 3 to 8 percent slopes	3.08	17	TBD	TBD	Prime Farmland
DaD	Dekalb channery loam, 15 to 25 percent slopes	1.68	9	TBD	TBD	Not Prime Farmland
DoC	Dormont silt loam, 8 to 15 percent slopes	6.00	34	TBD	TBD	Farmland of Statewide Importance
DtD	Dunmore channery silt loam, 15 to 25 percent slopes	0.14	1	TBD	TBD	Not Prime Farmland
DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	1.35	8	TBD	TBD	Not Prime Farmland
GdB	Glenford silt loam, 3 to 8 percent slopes	5.50	31	TBD	TBD	Prime Farmland
	Redhook CS Total (acres)	**17.75**				
Webster Interconnect						
GpF	Gilpin-Peabody complex, 35 to 70 percent slopes	0.02	<0.01	TBD	TBD	Not Prime Farmland
Sk	Skidmore gravelly loam	2.46	>99	TBD	TBD	Farmland of Statewide Importance
	Webster Interconnect Total (acres)	**2.48**				
Mobley Tap Site						
Sk	Skidmore gravelly loam	0.50	100	TBD	TBD	Farmland of Statewide Importance
	Mobley Tap Site Total (acres)	**0.50**				

Appendix 7-B

Soil Map Units at Aboveground Facilities

Soil Map Unit Symbol	Soil Map Unit Name	Anticipated Temporary Impact		Anticipated Permanent Impact a/		Designated Farmland
		Acres	Percent of Site	Acres	Percent of Site	
Applegate L/R Site						
GuB	Guernsey silt loam, 3 to 8 percent slopes	0.39	100	TBD	TBD	Prime Farmland
	Applegate L/R Site Total (acres)	**0.39**				
Hartson L/R Site						
WeD	Westmoreland silt loam, 15 to 25 percent slopes	0.11	100	TBD	TBD	Not Prime Farmland
	Hartson L/R Site Total (acres)	**0.11**				
H-302 Tap L/R Site						
DtF	Dormont-Culleoka complex, 25 to 50 percent slopes	0.33	100	TBD	TBD	Not Prime Farmland
	H-302 Tap L/R Total (acres)	**0.33**				

a/ Data that indicate which soils will be permanently impacted were not available at the time this resource report was written.
Sources: Soil Survey Staff 2015a, 2015b