

Site Restoration and Post-Construction Stormwater Management Plan

Pennsylvania Pipeline Project - South East Region: Spread 6

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LIST OF ACRONYMS

ACRONYM	MEANING
% CCE	Calcium carbonate equivalent
% ENV	Effective neutralizing value
ABACT	Antidegradation Best Available Combination of Technologies
BMP	Best Management Practice
E&SC	Erosion and Sediment Control
EV	Exceptional value
HDD	Horizontal directional drilling
HDPE	High-density polyethylene
HQ	High quality

NGL	Natural gas liquids
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PASDA	Pennsylvania Spatial Data Access
PCSM	Post-Construction Stormwater Management
Pls	Pure live seed
ROW	Right of way
SPPP	Sunoco Pennsylvanian Pipeline Project
SR	Site Restoration
TSF	Trout stock fisheries
Tt	Tetra Tech, Inc.
UNT	Unnamed tributary
WWF	Warm water fisheries

1.0 INTRODUCTION

Tetra Tech, Inc. (Tt) has prepared this Site Restoration and Post-Construction Stormwater Management (PCSM) Plan (Plan) for Sunoco Pipeline, L.P. (SPLP) – Pennsylvania Pipeline Project, South East Region: Spread 6. The Plan addresses activities associated with the Sunoco Pennsylvania Pipeline Project (SPPP) installation. Spread 6 (South East Region) of this project is located in Chester and Delaware Counties, Pennsylvania (PA). A site location map is provided in Attachment 1. The site restoration portion of the Plan will ensure prompt and effective stabilization of the pipeline right of way, associated workspaces, temporary access roads, and the vegetated block valve sites following pipeline construction.

2.0 SITE DESCRIPTION

Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project that would expand existing pipeline systems to provide natural gas liquid (NGL). The project involves the installation of approximately two parallel pipelines within a 306.8-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania (PA) to SPLP's Marcus Hook facility in Delaware County, PA with the purpose of interconnecting with existing SPLP Mariner East pipelines. A 20-inch diameter pipeline would be installed within the ROW from Houston to Marcus Hook (306.8 miles) and a second, 16-inch diameter pipeline, will also be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, PA to the Marcus Hook facility, paralleling the initial line for approximately 255.8 miles. The majority of the new ROW will be co-located adjacent to existing utility corridors, including approximately 230 miles of pipeline that will be co-located in the existing SPLP Mariner East pipeline system. The 20-inch pipeline will be installed first, followed by the 16-inch line. Any temporary stabilization required will be implemented in accordance with this Erosion and Sediment (E&S) Plan. Both pipelines will be installed within the same limit of disturbance (LOD) and in the same construction period. This SR and Post Construction Stormwater Management Plan specifically relates to impacts associated with the South East Region, Construction Spread 6.

Fifty feet will be maintained as permanent ROW. In addition, temporary use areas or extra workspaces will be required at some stream and road/railroad crossings; these will typically expand the construction ROW by 25 feet where needed. Construction activities will involve tree removal, clearing and grubbing within the ROW, trenching, pipe installation, and SR. The total LOD in the South East Region will be approximately 268 acres. Acres disturbed by county will be as follows: Chester County with 171 acres disturbed, and Delaware County with 97 acres disturbed.

Past and present land use of the project area and surrounding area is agricultural and forested land. Future land use will be a maintained vegetated natural gas pipeline ROW and agricultural land and forested land. Relevant topographic features including streams, streets, pipelines, structures, utility lines, fences, paving and other significant items along the gas line alignment are indicated on the plans, where applicable.

Five new block valve locations are proposed for the PADEP Southeast Region portion of the PPP project. Two additional block valves are proposed at existing sites, Elverson Interchange and Eagle Station, and do not expand the current impervious footprint or require grading. Below is a summary table of the seven block valves that will be constructed or co-located at an existing block valve with a proposed expansion.

Block valve/Station	Co-located or New	County	Township	Receiving water	Designated Use	Existing use	Impairments	PCSM Required?
Elverson Interchange	Existing no change in footprint	Chester	Elverson	UNT to Conestoga River	WWF	-	Agriculture-Nutrients; Other Nutrients; Other- Organic Enrichment/Low D.O.	No
Fairview Road	New – no new impervious	Chester	Wallace	Marsh Creek	HQ-TSF	-	TMDL- Cause Unknown ; Pesticides ; Nutrients ; Siltation ; Organic Enrichment/Low D.O. ; Suspended Solids	No
Eagle	Existing no change in footprint	Chester	Upper Uwchlan	UNT to Black Horse Creek	HQ-TSF	-	TMDL- Cause Unknown ; Pesticides ; Nutrients ; Siltation ; Organic Enrichment/Low D.O. ; Suspended Solids	No
East Lincoln Highway	New – no new impervious	Chester	West Whiteland	Trib 00276 to Valley Creek	CWF	-	Urban Runoff/Storm Sewers-Water/Flow Variability; Urban Runoff/Storm Sewers-Siltation	No
Boot Road	New – no new impervious	Chester	West Goshen	Trib 00682 to Ridley Creek	HQ-TSF	-	Urban Runoff/Storm Sewers-Siltation; Urban Runoff/Storm Sewers-Water/Flow Variability;	No

**Table 1
Block Valve and Station Summary Table**

Block valve/Station	Co-located or New	County	Township	Receiving water	Designated Use	Existing use	Impairments	PCSM Required?
							Urban Runoff/Storm Sewers- Cause Unknown	
Middletown Road	New – no new impervious	Delaware	Thornbury	Trib 00599 Chester Creek	TSF	-	Urban Runoff/Storm Sewers- Cause Unknown; Urban Runoff/Storm Sewers- Water/Flow Variability; Urban Runoff/Storm Sewers- Siltation	No
S. Pennell Road	New – no new impervious	Delaware	Middletown	Trib 00576 to Chester Creek	TSF	-	Urban Runoff/Storm Sewers- Cause Unknown; Urban Runoff/Storm Sewers- Water/Flow Variability; Urban Runoff/Storm Sewers- Siltation	No

2.1 TOPOGRAPHY

The work zone is located on ground of varying elevations. Site elevations vary from 23 feet (Chester Creek in Delaware County) to 741 feet (western border of Chester County) above mean sea level based on the Pennsylvania Spatial Data Access (PASDA). The construction plans show the topography of the site and the surrounding area.

2.2 GEOLOGY AND SOILS

The soils and geologic formations surrounding the site are shown on the figures provided in Attachment 2. Attachment 2 also provides soil descriptions and properties of the soils found at the site. In general, the following actions will be taken to counteract soil limitations:

1. Erodible Soils - Prompt stabilization practices will be implemented to minimize the risk of erosion. PCSM facilities have been designed to minimize point-source discharges which increase the likelihood of downstream erosion.
2. Cut Banks Caves - Almost all Pennsylvania soils are susceptible to caving of cut banks. Cut slopes will be stabilized as soon as possible with seed and mulch to prevent sliding. Slopes are designed to not exceed 2H:1V.
3. Corrosive to Concrete or Steel Pipe - Pipes to be used on site shall be either HDPE or coated steel.
4. High Water Table - A seasonal high groundwater determination was conducted at the proposed block valve sites. PCSM facilities that infiltrate have been designed to maintain a 20" separation from the seasonal high groundwater table.
5. Low Strength - Most of Pennsylvania soils (73%) have relatively low strength. Precautions will be taken to prevent slope failures due to improper construction practices. Soils will be evaluated during construction of block valve sites and PCSM facilities to determine whether additional measures will need to be taken.
6. Piping Tendencies -Piping is the erosion by percolating waters or seepage in layer of subsoil resulting in caving and the formation of tunnels or pipes thorough which the soluble or granular material is removed. Where necessary, anti-seep collars will be used to prevent piping.
7. Poor Topsoil -Soil amendments will be added to site soils to promote vegetative growth.
8. Potentially Hydric -A wetland delineation has been performed to determine the presence of wetlands.
9. Potential Sinkhole - Should a sinkhole be encountered during construction, repair should be done under the direct observation and supervision of a professional geologist or licensed geotechnical engineer. Site specific sinkhole repairs should be developed on a case by case basis. Block valves located within karst topography have been identified, and infiltration practices have been designed to minimize the risk of sinkholes.

To prevent sediment from leaving the site, stabilization practices will be implemented in disturbed areas as soon as practical. Geologic formations or soil conditions that may have the potential to cause pollution after earth disturbance were not observed during field activities. Infiltration tests are being performed and results are being evaluated for the design of the proposed post construction stormwater BMPs.

2.3 SURFACE WATER HYDROLOGY

The SPPP area surface water runoff drains to surface waters and unnamed tributaries (UNTs) designated as high quality (HQ), warm water fisheries (WWF), exceptional value (EV), cold water fisheries (CWF), and trout

stock fisheries (TSF) under Pa. Code 25 Chapter 93. Descriptions of the Primary Receiving Waters can be found in Table 1.

The plan contains Antidegradation Best Available Combination of Technologies (ABACT) BMPs to maintain the designated use of the receiving waters and prevent additional siltation from polluting the streams. The locations of the receiving waters relative to the project area can be seen on the USGS location map in Attachment 1.

3.0 SITE RESTORATION PRACTICES

Section 3.0 addresses restoration of the mainline pipeline, temporary workspaces, temporary access roads, and the block valve sites which will be vegetated. Following completion of pipeline installation and trench backfilling, the pipeline ROW, associated workspaces, and temporary access roads shall be returned to the general grade present prior to pipeline installation in order to maintain preconstruction drainage patterns. After completion of major construction work, topsoil that was stockpiled during construction will be placed along the ROW. Grounds disturbed by any of the operations necessary to complete the work for this project within the ROW are to be permanently seeded, or if specified, sodded, unless occupied by structures, paved, or designated as a permanent access road. Disturbed areas, which are at final grade, shall be seeded and mulched once final grades are achieved. The permanent seed mixture will restore disturbed areas to a meadow in good condition or better. If seeding cannot be completed within a 4 day period due to weather conditions, the disturbed area will be mulched with straw at the rate of 3 tons per acre. This straw will be anchored using a method described in Section 3.4.

Site restoration will be accomplished in several ways, depending on the site conditions:

Co-located valve sites at existing valve or station locations or those with no new impervious area – 2 (Elverson Interchange and Eagle) will be restored to the existing gravel condition, in accordance with 102.8g(2)(ii) and 102.8g(3)(iii).

Valve sites with no impervious area (vegetated cover) – 5

Fairview Road	East Lincoln Highway	Boot Road	Middletown Road
South Pennell Road			

Block valves are typically surfaced with compacted gravel to provide a clean and a mud-free work area to facilitate inspection and access while minimizing maintenance costs. However, at the 5 vegetated block valve locations listed above, right-of-way constraints preclude installation of stormwater BMPs which are needed if a compacted gravel work surface is installed. At these locations, in lieu of a compacted gravel surface, a vegetated surface will be established to return the site to meadow condition or better. At the remaining block valves (except the co-located valves), traditional gravel areas and PCSM BMPs will be installed because there is space available to install and they are preferred for site maintenance.

In order to prevent compaction of the ground surface and provide structural support for vehicles at the vegetated valve sites, Geoweb cellular confinement will be used to reinforce the topsoil layer and minimize rutting due to the occasional maintenance truck. Geoweb is manufactured by Presto Geosystems and is a 3-Dimensional

structure made up of interconnected cells that confines the cellular fill and controls shearing, lateral and vertical movement.

If the subgrade is compacted from pipeline construction, it will be scarified prior to Geoweb installation per the procedures outlined below. Geoweb will be installed over a stabilization geotextile on the subgrade. The Geoweb cells will be filled with a mix of topsoil and aggregate to ensure the soil media can support a vegetative ground cover. The use of this topsoil/aggregate mix in a ratio of two-thirds aggregate (AASHTO #57) and one-third screened topsoil was selected based on the manufacturer's recommendation for load support combined with infiltration (see Attachment 7). AASHTO #57 is an open graded permeable aggregate with a void ratio of approximately 35-40 percent. At one-third of the mixture, the percentage of topsoil in the infill mix closely approximates the void ratio of the aggregate so that the aggregate supports the vehicular loads when confined in the Geoweb cells while the topsoil supports vegetation growth and permits infiltration.

The seeding will establish ground cover of a meadow condition or better, in accordance with Section 3.1. As a result of establishing ground cover of a meadow condition or better and because the aggregate, topsoil, Geoweb, and stabilization geotextile are all permeable, they will promote infiltration.

Once installed, Geoweb will help in preserving the subsoils in their decompacted state because the Geoweb will distribute vehicular loads and prevent rutting.

Access roads where Geoweb will be used have slopes up to approximately 20 percent. Manufacturer's recommendations as outlined in the attached letter from the manufacturer will be followed for anchoring the Geoweb (Attachment 7).

3.1 BMP DESCRIPTION AND CONSTRUCTION SEQUENCE

A generalized construction sequence is provided below. The construction sequence is intended to provide a general course of action to conform to the applicable regulatory agency requirements for restoration and post-construction stormwater management of the site. Necessary steps for proper and complete execution of work pertaining to this plan, whether specifically mentioned or not, are to be performed by the contractor. The contractor will comply with all requirements listed in this section. The contractor may be required to alter controls based on the effectiveness of controls or differing conditions encountered in the field. The appropriate county conservation district and DEP shall be contacted and must approve any deviation to the authorized plans.

A pre-construction meeting is required prior to the start of any construction activity. The Pennsylvania Department of Environmental Protection (PADEP) or applicable county conservation district, contractors, the landowner, appropriate municipal officials, and the plan preparer must be invited to this meeting at least 7 days in advance.

General Construction Sequence

1. Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.
2. Surface roughening will be utilized to rough the soil surface with horizontal depressions for the purpose of reducing runoff velocity, increasing infiltration, aiding the establishment of vegetation, and reducing erosion. Surface roughening should be applied to slopes 3H:1V or steeper unless a stable rock face is provided or it can be shown that there is not a potential for sediment pollution to surface waters. For roughened surfaces within 50 feet of a surface water, and where blanketing of seeded areas is proposed as the means to achieving permanent stabilization, spray-on type blankets are recommended. Surface roughening shall be accomplished using dozers affixed with grouser tracked equipment. Dozers shall run up and down the slopes leaving horizontal grooves perpendicular to the slope. Dozer blades shall be raised and not used during surface roughening. Where compaction does occur, contractor shall scarify the soil or provide additional roughening such as deep ripping or chisel ripping to restore the area to a minimal compacted state. In areas of proposed infiltration, soils shall be amended to 2' below grade. See Soil Amendment and Restoration construction sequence below.
3. Place topsoil from topsoil stockpiles as the upper layer of backfill. Topsoil shall not be placed when the subgrade is frozen or when it is excessively wet or dry and shall not be handled when in a frozen or muddy condition.
4. Remove gravel and geotextile from the temporary access roads and scarify the soil. Refer to step 2 of this sequence to address compaction at access roads. After addressing compaction concerns, place topsoil that was stripped prior to installation of the access roads.
5. Immediately seed and mulch disturbed areas in accordance with the permanent seeding schedule once final grade is established and topsoil is placed.
6. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70-percent perennial vegetative cover is established. Regrade and revegetate areas disturbed during the removal of the erosion and sediment controls.

Soil Amendment and Restoration Construction Sequence

1. Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.
2. In the designated soil amendment area, till the ground and mix in the compost at a ratio of 2:1 (soil:compost) to a depth of 24 inches.

3. Immediately seed and mulch disturbed areas once final grade is established in accordance with the permanent seeding schedule.
4. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70% perennial vegetative cover is established.

Geoweb Construction Sequence

1. Grade surface to subgrade elevations as soon as practicable following completion of pipe installation. Do not compact.
2. If needed, scarify the soil or provide additional roughening such as deep ripping or chisel ripping to restore the area to a minimal compacted state.
3. Install geotextile separation layer in accordance with manufacturer’s recommendations.
4. Expand Geoweb to required dimensions and anchor edges with ATRA Anchors, if needed. Join adjacent sections with ATRA Keys.
5. Anchor Geoweb on slopes greater than 5% with 24” ATRA Anchors placed on a 3x8 cell pattern.
6. Mix and place engineered infill material (2/3 AASHTO #57 stone and 1/3 screened topsoil) into the Geoweb cells. Infill material shall be free-flowing and not frozen when placed in the Geoweb sections. Limit drop height to 3 feet to avoid damaging or displacement of the cell wall. Slightly overfill the cells and level off material once settlement is negligible. Do not compact.
7. Seed and mulch filled sections in accordance with the permanent seeding schedule once infill is placed.
8. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70-percent perennial vegetative cover is established.

Permanent Seeding

Site preparation and establishment of permanent cover in areas other than lawns will be conducted according to the following guidelines:

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SLOPES AND BANKS (NOT MOWED) WELL-DRAINED VARIABLE DRAINAGE	1 PLUS 1 PLUS	3, 5, 8, OR 12 (1) 3 OR 7
SLOPES AND BANKS (MOWED) WELL-DRAINED	1 PLUS	2 OR 10
SLOPES AND BANKS (GRAZED/HAY) WELL-DRAINED	1 PLUS	2,3, OR 13
GULLIES AND ERODED AREAS	1 PLUS	3, 5, 7, OR 12 (1)
EROSION CONTROL FACILITIES (BMPS) SOD WATERWAYS, SPILLWAYS, FREQUENT WATER FLOW AREAS DRAINAGE DITCHES	1 PLUS	2, 3, OR 4

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SHALLOW, LESS THAN THREE FEET DEEP DEEP, NOT MOWED POND BANKS, DIKES, LEVEES, DAMS, DIVERSION CHANNELS, AND OCCASIONAL WATER FLOW AREAS	1 PLUS 1 PLUS	2, 3, OR 4 5 OR 7
MOWED AREAS NON-MOWED AREAS FOR HAY OR SILAGE ON DIVERSION CHANNELS AND OCCASIONAL WATER FLOW AREAS	1 PLUS 1 PLUS 1 PLUS	2 OR 3 5 OR 7 3 OR 13
HIGHWAYS NON-MOWED AREAS WELL-DRAINED VARIABLE DRAINED POORLY DRAINED AREAS MOWED SEVERAL TIMES PER YEAR	1 PLUS 1 PLUS 1 PLUS 1 PLUS	5, 7, 8, OR 10 3 OR 7 3 2, 3, OR 10
UTILITY ROW WELL-DRAINED VARIABLE DRAINED WELL-DRAINED AREAS FOR GRAZING/HAY	1 PLUS 1 PLUS 1 PLUS	5, 8, OR 12 (1) 3 OR 7 2, 3, OR 13
EFFLUENT DISPOSAL AREAS	1 PLUS	3 OR 4
SANITARY LANDFILLS	1 PLUS	3, 5, 7, 11 (1), OR 12 (1)
SURFACE MINES SPOILS, MINE WASTES, FLY ASH, SLAG, SETTLING BASIN RESIDUES AND OTHER SEVERELY DISTURBED AREAS (LIME TO SOIL TEST) SEVERELY DISTURBED AREAS FOR GRAZING/HAY	1 PLUS 1 PLUS	3, 4, 5, 7, 8, 11 (1) OR 12(1) 3 OR 13
LAWN	1 PLUS	PENNDOT Formula B

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	SPECIES	SEEDING RATES – PLS (1)	
		MOST SITES	ADVERSE SITES (8)
1 (2)	spring oats (spring), or 64 96	64	96
	annual ryegrass (spring or fall), or	10	15
	winter wheat (fall), or	90	120
	winter rye (fall)	56	112
2 (3)	tall fescue, or 75	60	75
	fine fescue, or 40	35	40
	kentucky bluegrass, plus 25 30	25	30
	redtop(4), or	3	3
3	perennial ryegrass	15	20
	birdsfoot trefoil, plus 6 10	6	10
4	tall fescue	30	35
	birdsfoot trefoil, plus	6	10
5 (5)	reed canarygrass	10	15
	Big Bluestem, plus	10	15
6 (5,6)	tall fescue, or	20	25
	perennial ryegrass	20	25
	Big Bluestem, plus	10	15

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	SPECIES	SEEDING RATES – PLS (1)	
		MOST SITES	ADVERSE SITES (8)
7 (5)	annual ryegrass	20	25
	birdsfoot trefoil, plus	20	30
	Big Bluestem, plus	20	30
	tall fescue	20	25
8	flatpea, plus	20	30
	tall fescue, or	20	30
	perennial ryegrass	20	25
9	Not applicable to project	N/A	N/A
10	tall fescue, plus	40	60
	fine fescue	10	15
11	deertongue, plus	15	20
	birdsfoot trefoil	6	10
12(7)	switchgrass, or	15	20
	big bluestem, plus	15	20
	birdsfoot trefoil	6	10
13	orchardgrass, or	20	30
	smooth bromegrass, plus	25	35
	birdsfoot trefoil	6	10

1. Pure live seed (pls) is the product of the percentage of pure seed times percentage germination divided by 100. For example, to secure the actual planting rate for switchgrass, divide 12 pounds pls shown on the seed tag. Thus, if the pls content of a given seed lot is 35 percent, divide 12 pls by 0.35 to obtain 34.3 pounds of seed required to plant one-acre. All mixtures in this table are shown in terms of pls.
2. If high-quality seed is used, for most sites seed spring oats at a rate of two bushels per acre, winter wheat at 11.5 bushels per acre, and winter rye at one bushel per acre. If germination is below 90 percent, increase these suggested seeding rates by 0.5 bushel per acre.
3. This mixture is suitable for frequent mowing. Do not cut shorter than 4 inches.
4. Keep seeding rate to that recommended in table. These species have many seeds per pound and are very competitive. To seed small quantities of small seeds such as weeping lovegrass and redtop, dilute with dry sawdust, sand, rice hulls, buckwheat hulls, etc.
5. Use for highway slopes and similar sites where the desired species after establishment is Big Bluestem.
6. Use only in extreme southeastern or extreme southwestern PA. *Serecia lespedeza* is not well adapted to most of PA.
7. Do not mow shorter than 9 to 10 inches.

8. If liming, fertilization, and preparation of seedbed are properly done and if care is taken to drill and cover the seed (or mulch applied), the rate for “most sites” should suffice. However, on eroded or coarse and poorly prepared seedbeds, particularly if the soil is very acidic or infertile, the rate for “adverse sites” should be used.
9. For seed mixtures 11 and 12, only use spring oats or weeping lovegrass (included in mix) as nurse crop.

In lawn areas, permanent cover will be established using the following PENNDOT seed mixture:

PENNDOT FORMULA B				
Seeding Rate	3 lbs. per 1,000 square feet			
Species	% by Weight	Purity %	Minimum % Germination	Maximum % Weed Seed
Kentucky Bluegrass	50	98	80	0.20
Perennial Rye	20	98	90	0.15
Red Fescue	30	98	85	0.15

Liming Rates

Minimum 6 tons per acre at 100% effective neutralizing value (% ENV), unless the soil test determines that a lesser amount is needed. To determine the actual amount of regular lime to apply, divide the amount called for by the soil test by the % ENV for the product used. For example, if 6 tons per acre is needed and the %ENV for the lime used is 88%, divide 6 by 0.88 resulting in 6.8 tons needing to be applied. For dolomitic lime, which has a significant amount of magnesium in it, divide the amount called for by the soil test by the % calcium carbonate equivalent (% CCE) listed for the product instead of the % ENV. The % CCE may be above 100% which accounts for the fact that magnesium has a greater effect per pound than the calcium in regular lime. Note: When a soil test requires more than 8,000 pounds of lime per acre, the lime must be mixed into the top 6 inches of soil.

Fertilization Rates

Apply 10-20-20 at 600 pounds/acre, if top dressed or 1,000 pounds/ac, if incorporated, unless the soil test determines that the rate can be less than these minimums.

SOIL AMENDMENT APPLICATION RATE EQUIVALENTS				
Soil Amendment	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yds.	
AGRICULTURAL LIME	6 TONS	240 LBS.	240 LBS.	or as per soil test; may not be required in agricultural fields or as per soil test; may not be required in agricultural fields
10-20-20 FERTILIZER	1,000 LBS.	25 LBS.	25 LBS.	

Temporary Seeding

Temporary grass cover will be established in the following areas where soil stockpiles are exposed for a period greater than 4 days. The seed mixture for temporary cover will consist of 100% annual ryegrass. Seed will be applied at the rate of 40 pounds per acre or as recommended by a local recognized seed supplier approved by the Owner's representative. Prior to seeding, apply 1 ton of agricultural grade limestone per acre plus 10-10-10 fertilizer at the rate of 500 pounds per acre and work into the soil.

Mulching

The purpose of mulch is to reduce runoff and erosion, prevent surface compaction or crusting, conserve moisture, aid in establishing plant cover, and control weeds. Mulch will be applied on any area subject to erosion or that has unfavorable conditions for plant establishment and growth. The practice may be used alone or in conjunction with other structural and vegetative conservation practices such as waterways, ponds, sedimentation traps, or critical area planting. On sediment-producing areas where the period of exposure is less than 2 months, mulch materials will be applied according to the following guidelines:

1. Straw mulch will be applied at the rate of 3 tons per acre. Chemically treated or salted straw is not acceptable as mulch.
2. Straw mulch will be anchored immediately after application by at least one of the following methods:
 - A. "Crimped" into the soil using tractor-drawn equipment (straight-bladed coulter or similar).

This method is limited to slopes no steeper than 3:1. Machinery should be operated on the contour. (Crimping of hay or straw by running it over with tracked machinery is not recommended.)
 - B. Asphalt, either emulsified or cut-back, containing no solvents or other diluting agents toxic to plant or animal life, uniformly applied at the rate of 31 gallons per 1,000 square feet.

- C. Synthetic binders (chemical binders) may be used as recommended by the manufacturer to anchor mulch provided that sufficient documentation is provided to show that it is non-toxic to native plant and animal species.
- D. Lightweight plastic, fiber, or paper nets may be stapled over the mulch according to the manufacturer's recommendations.

Mulched areas will be checked periodically and after each runoff event (e.g., rain, snowmelt, etc.) for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

3.2 MATERIAL RECYCLING AND DISPOSAL

The operator will remove from the site, recycle, or dispose of all building materials and wastes in accordance with PADEP's solid waste management regulations at 25 Pennsylvania Code 260.1 et seq., 271.1 et seq., and 287.1 et seq. The contractor will not illegally bury, dump, or discharge building material or wastes at the site. Excess material brought into the site areas to facilitate construction access will be completely removed prior to rough grading and final surface stabilization. Expected construction wastes during site restoration will consist of packaging material and sediment cleaned from E&SC BMPs. Packaging from materials brought on site will be disposed of by a licensed hauler. Sediment removed from BMPs will either be spread in a protected area to dry and then recycled as fill material prior to permanent seeding or disposed of off-site. In cases where disposal is necessary, waste materials will be disposed of at an approved PADEP waste site.

3.3 THERMAL IMPACTS

Thermal impacts are most commonly associated with urbanization (i.e., increased impervious surfaces) that results in heated stormwater runoff flowing into receiving waters where it mixes, and potentially increases the base temperature of the surface water in streams. However, another contributing factor for stream temperature is solar exposure (radiant energy input) to the surface water, typically ponded, standing waters. The amount of heat transferred, and the degree of thermal pollution is of importance for fisheries management and the ecological integrity of receiving waters. Among the attributes that determine the contribution of solar energy to thermal impacts are the presence of riparian vegetation, as well as stream width, depth, flow regime (perennial, intermittent, ephemeral), and orientation.

Thermal impacts have been minimized by limiting the disturbed area to the maximum extent practicable. By minimizing the extent of the disturbed area, vegetative clearing, including forested areas, has been minimized. Vegetated block valve sites will be restored to a meadow in good condition or better, and no impervious surface will be created at those sites. Following installation of the pipelines, existing grades along the pipeline right of way, additional temporary workspaces, and temporary access roads will be restored, permanent seeding will occur as soon as practicable to facilitate vegetative growth during germinating months, and the addition/creation

of impervious surfaces in riparian areas has been avoided. By returning these areas to their existing grades, stormwater is unlikely to pond in these locations therefore minimizing the potential for ponded water to result in significant contributions to thermal impacts in receiving waters. In addition, thermal impacts will be minimized during site restoration by facilitating permanent seeding as soon as practicable to encourage vegetative growth. Although shade cover will be reduced in areas that were previously forested, there is no anticipated adverse effect to the receiving watersheds because the project will only clear a narrow corridor of vegetation within each respective watershed. The Project does not have thermal impacts. Specifically, thermal impacts will be avoided by implementing the following:

- Siting parallel to and overlapping with existing ROWs to minimize vegetation clearing at stream crossings;
- Reducing the construction ROW width and additional temporary workspaces at stream crossings;
- No grubbing, grading, or clearing of trees will occur within 50 feet of the top of stream bank until pipeline construction/installation is ready to proceed through that area.
- Restoring (seeding) disturbed areas/ROW as soon as practicable and /or directing runoff to vegetated areas to reduce the temperature of runoff prior to discharge into the streams; and,
- Restoring the stream banks and seeding/planting as soon as practicable to facilitate vegetative growth along the stream channel.

3.4 RIPARIAN FOREST BUFFERS

Pennsylvania Pipeline Project - Riparian Forest Buffer Waiver Request

The Pennsylvania Pipeline Project qualifies for an exception of the riparian forest buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area. Existing riparian forest buffers within the project area are identified on the E&S plan drawings in Attachment 2 of the E&S Plan.

In addition to the exception, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area. A detailed riparian buffer waiver request has been prepared as an attachment to the ESCGP-2 Notice of Intent.

Demonstration of Waiver Necessity

A riparian forest buffer waiver is necessary to complete the intended scope of the pipeline project. The project involves the installation of approximately two parallel pipelines within a 306-mile, 50-foot-wide ROW from Houston, Washington County, PA to SPLP's Marcus Hook facility in Delaware County, PA with the purpose of interconnecting with existing SPLP Mariner East pipelines. A 20-inch diameter pipeline would be installed within the ROW from Houston to Marcus Hook (306 miles) and a second, 16-inch diameter pipeline, will also be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station,

Westmoreland County, PA to the Marcus Hook facility, paralleling the initial line for approximately 255 miles. Spread 6 (South East Region) of this project crosses through Chester and Delaware Counties, PA. Due to the linear nature of the project and the surrounding topography, riparian forest buffers could not be avoided altogether.

Alternatives Analysis

Impacts to environmental resources, including riparian forest buffers, were evaluated during the pipeline routing phase of the project. Field teams were deployed to evaluate alternate routes based on environmental and constructability constraints. The final route that was selected minimizes environmental impacts to the maximum extent practicable while still maintaining the project's overall constructability and ensuring a safe working environment while also taking landowner constraints into consideration. Additionally, several variations of horizontal direction drill profiles were evaluated to minimize pullback areas, additional workspaces, and overall disturbance within riparian forest buffers. Permanent features, such as access roads and block valves, were evaluated to locate the features outside of the riparian forest buffer, where possible.

Demonstration of Minimizing Impacts

All disturbance activities, including those which impact riparian forest buffers, have been reduced to the maximum extent practicable. The LOD has been reduced to 50 feet wide at all stream crossings within the riparian forest buffer area where possible adjacent to the stream area required for crossing and construction. In areas where it is not practicable to reduce the LOD throughout the entire extent of the riparian forest buffer, the LOD has been reduced to 50 feet wide within 10 feet of the stream banks to limit the proximity of the work areas as per the stream crossing detail from the 2012 PADEP Erosion and Sediment Control Program Manual. The operations within the LOD near stream crossings typically includes a topsoil stockpile, a stockpile for pipe trench excavation material, a pipe trench, a travel lane, a work area for equipment operation and pipeline welding outside the trench, and an area to install the erosion control BMPs. In addition, site conditions such as steep slopes, varying depths of topsoil, and other on-site conditions limit the amount of work area. Reducing the LOD to a greater extent could potentially result in unsafe working conditions and would hinder the ability to complete the stream crossing within the required time frame of 24 hours or less. Workspaces that provide additional space for stream crossing activities have been placed outside of riparian forest buffers where possible.

Meeting Requirements of Chapter 102

All other aspects of Chapter 102 are being met. The project's E&SC Plan and SR/Post-Construction Stormwater Management Plan have been designed in accordance with Chapter 102. In accordance with Chapter 102, and E&S plan has been developed to minimize the sediment entering the buffer areas. A SR plan is proposed to revegetate the areas adjacent to the buffers within the ROW.

3.5 INSPECTION AND MAINTENANCE PROCEDURES

Seeded areas will be inspected weekly and after each runoff event for bare spots, washouts, and healthy growth. Necessary repairs will be made immediately. Mulched areas will be checked periodically and after severe storms for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

All sedimentation control measures will remain in place until the disturbed areas are stabilized and a uniform 70-percent perennial vegetative cover is established. Any area not achieving a 70-percent vegetative cover will be reseeded and mulched within 24 hours of detection. If BMPs are found to be inoperative or ineffective during an inspection, PADEP should be contacted within 24 hours, followed by submission of a written noncompliance report to PADEP within 5 days of the initial contact.

Long-Term Maintenance

Long-term maintenance of the pipeline ROW will include periodic visual inspections for sufficient vegetative growth and cover. Insufficient vegetative cover is defined as any area not achieving a uniform 70-percent perennial vegetative cover. Bare spots and areas with insufficient vegetative cover will be reseeded and mulched within 24 hours of discovery. The ROW will be inspected for signs of erosion, especially on steep slopes. Corrective measures will be taken, as needed. If there is evidence of trench settling, the area will be regraded to maintain pre-construction drainage patterns, mulched, and seeded. A written report is required for each inspection and for each repair or maintenance activity, and the report should specify how to access the site. SPLP is responsible for maintaining the ROW under the provisions of this permit.

3.6 ANTIDEGRADATION REQUIREMENTS

Earth-disturbance activities associated with the Pennsylvania Pipeline project will be located within siltation-impaired watersheds and HQ/EV special protection watersheds. A combination of non-discharge alternatives and the use of ABACT BMPs on site will protect the water quality of the receiving waters, in accordance with 25 Code §102.8(h).

Non-discharge alternatives were evaluated to minimize accelerated erosion and sedimentation and achieve zero net change in runoff between the pre- and post-construction conditions. The non-discharge alternatives evaluated were the use of infiltration and maintaining pre-construction drainage patterns within the right of way, temporary additional workspaces, and temporary access roads. The permanent waterbars will not divert or diminish the amount of water within the watershed but are intended to manage runoff velocity and potential degradation related to sediment laden runoff into receiving waters. As such, there will be no change to pre-existing drainage patterns as the permanent water bars will continue to direct water to the same receiving waters while providing the protection required in the PADEP Manual regarding slopes. The non-discharge alternatives were incorporated wherever feasible by minimizing soil compaction, restoring the infiltration capacity of the soil prior to permanent seeding, and restoring the disturbed area back to its original grade and

cover condition for the mainline pipeline. To alleviate compaction, surface roughening techniques such as deep ripping or chisel ripping will restore compacted areas to a minimal compacted state prior to permanent stabilization. The extent of the disturbed area will be minimized, and the duration of disturbance will be minimized by stabilizing disturbed areas as soon as practicable. ABACT BMPs will be used on site to protect and maintain the existing water quality of receiving waters.

Due to the linear nature of this project, all of the siltation impaired and HQ/EV special protection watersheds received the same non discharge alternative evaluation and incorporation of ABACT site restoration BMPs throughout the pipeline.

Five block valve facilities in the South East Region that are proposed to be vegetated sites. All five of these sites are located in a special protection watershed. By proposing vegetation instead of gravel, there will be no increase in impervious area. In addition, the existing Eagle block valve is located within a special protection watershed. No expansion of the existing impervious area is proposed at that location.

There will not be an increase in stormwater runoff rate or volume to prevent the physical degradation of the receiving water, such as scour, and stream bank destabilization. Stormwater runoff volume is not increasing throughout post-construction, and any post-construction stormwater discharge is managed so that it will not degrade the physical, chemical or biological characteristics of the receiving stream.

Filtration through the existing vegetation and soil is an efficient way to remove suspended stormwater pollutants such as sediment, as the suspended particles are physically filtered from the stormwater as it flows through the vegetation and percolates into the soil.

The extent of the disturbed area at each of the block valve sites will be minimized, and the duration of disturbance will be minimized by stabilizing disturbed areas as soon as practicable. Cut and fill for the project sites have been minimized. Where possible based on the criteria listed above, sites were located in areas with shallow slopes to minimize the amount of cut and fill required. The sites will be restored promptly with proper vegetative cover techniques.

At sites where vegetated geoweb is proposed, antidegradation requirements for the special protection watersheds are met because no impervious area is proposed. The runoff will be managed so that it will not degrade the physical, chemical, or biological characteristics of the receiving streams.

ABACT site restoration BMPs will include the following:

- Pre-construction drainage pattern intact
- Minimizing the disturbed area
- No direct discharge to surface waters

- Prompt site restoration
- Proper vegetative cover techniques

3.7 STORMWATER RUNOFF ANALYSIS

This section applies to all areas of the project, excluding permanent access roads and block valve sites. All disturbed areas within the pipeline right of way, additional temporary workspaces, and temporary access roads will be restored to a meadow in good condition or better or a lawn condition. The pre-construction drainage patterns surrounding the project will be maintained for the areas of the project covered under this section. As a result of restoring the pipeline right of way, additional temporary workspaces, and temporary access roads to a meadow condition and maintaining pre-construction drainage patterns in accordance with 25 Pa Code § 102.8(n), there will be no increase in stormwater runoff rate or volume attributed to these locations, and a quantitative stormwater analysis is not required.

The proposed mainline pipeline will be restored in accordance with 102.8(n) and meet the requirements outlined in §§ 102.8(b), (c), (e), (f), (h), (i), (l), and (m).

In accordance with § 102.8(b), the following principles have been incorporated into the project design in accordance with the numbering in § 102.8(b): (1) The integrity of stream channels and the physical, biological, and chemical qualities of the receiving waters will remain unchanged. The site restoration principles will protect the existing and designated uses of the receiving waters. BMPs will be maintained until the site achieves stabilization during site restoration to ensure that runoff which leaves the project site will have no short-term adverse effects on the physical, biological, or chemical qualities of downstream receiving waters. The permanent seed mixture will restore the majority of the right of way to a meadow condition. Those areas which are not restored to a meadow condition will be restored to a lawn condition or forest. As a result of restoring the pipeline right of way as specified in the restoration plan, there will be no long-term effects to the physical, biological, or chemical qualities of downstream receiving waters. (2) The mainline pipeline will be restored to original grade so flow paths will not be altered. The right of way will be restored to achieve a meadow in good condition or better, with the exception of areas that will be returned to lawn or forest. In addition, the pipeline right of way accounts for only a narrow corridor of development within each drainage area to the nearest receiving water. As a result, post-development runoff rates to the nearest receiving water will not increase. (3) The right of way will be restored to a meadow in good condition or better in most areas, with the exception of specified locations where the right of way will be restored to the equivalent of its predevelopment land cover (lawn or forest). As a result, any potential increase in stormwater runoff volume has been minimized to the maximum extent practicable. (4) There are no proposed, permanent impervious features associated with the mainline pipeline. Temporary access roads will be restored to a vegetated condition following installation of the pipeline. (5) Existing drainage features and vegetation will be protected by restoring the project area back to its original grade. As a result, drainage features and existing vegetation surrounding the project area will be preserved. (6) Land clearing and grading will be minimized because the project area has been limited to the

area required to safely install the natural gas pipelines. The pipeline right of way will be returned to original grade following installation of the pipelines. (7) Soil compaction will be minimized by utilizing travel lanes within the pipeline right of way. Following construction, areas that have been compacted will be scarified or ripped, or soil amendments will be incorporated prior to backfilling topsoil and seeding. After initiating restoration, vehicular traffic will be restricted to prevent soil compaction. (8) As demonstrated in 102.8(2) and 102.8(3), potential increases in post development stormwater runoff has been minimized to the maximum extent practicable utilizing nonstructural restoration BMPs.

In accordance with § 102.8(c), the mainline Site Restoration and Post Construction Stormwater Management Plan has been planned and designed and will be implemented in consistency with the E&S Plan.

In accordance with § 102.8(e), the Site Restoration and Post Construction Stormwater Management Plan has been prepared by Robert F. Simcik, P.E. who is trained and experienced in PCSM design methods and techniques applicable to the size and scope of the proposed pipeline project.

In accordance with § 102.8(f), the Site Restoration and Post Construction Stormwater Management Plan contains drawings and a narrative consistent with the requirements of Chapter 102. The Plan has been designed to minimize the threat to human health, safety, and the environment to the greatest extent practicable. The Plan includes the required information as outlined in § 102.8(f)(1) through § 102.8(f)(15).

In accordance with § 102.8(h), nondischarge alternatives for Special Protection waters are evaluated in the Antidegradation section of the Site Restoration and Post Construction Stormwater Management Plan. The Plan includes ABACT BMPs where nondischarge alternatives do not exist for the project.

In accordance with § 102.8(i), the applicant has submitted the Site Restoration and Post Construction Stormwater Management Plan to the applicable county conservation districts and Department of Environmental Protection for review and approval. Upon complaint or site inspection, the Plan will be available for subsequent review and inspection by the reviewing agencies.

In accordance with § 102.8(l), the permittee will include with the notice of termination "Record Drawings" with a final certification statement from a licensed professional, which reads as follows:

"I (name) do hereby certify pursuant to the penalties of 18 Pa.C.S.A. § 4904 to the best of my knowledge, information and belief, that the accompanying record drawings accurately reflect the as-built conditions, are true and correct, and are in conformance with Chapter 102 of the rules and regulations of the Department of Environmental Protection and that the project site was constructed in accordance with the approved PCSM Plan, all approved plan changes and accepted construction practices."

In accordance with § 102.8(m), the Site Restoration and Post Construction Stormwater Management Plan identifies that the permittee shall be responsible for long-term operation and maintenance of PCSM BMPs

associated with permanent surface sites. However, there are no PCSM BMPs proposed as part of the mainline pipeline.

There are no proposed permanent gravel access roads and block valve pads in the South East Region.

4.0 POST-CONSTRUCTION STORMWATER MANAGEMENT ANALYSIS

No permanent gravel access roads and gravel block valve sites will be constructed as part of this project in the South East region. Five new block valves will be constructed as part of this project but will be vegetated sites. Two existing block valve sites will also be utilized, but no expansion of the existing impervious area is proposed.

The proposed, vegetated block valve sites will be restored in accordance with 102.8(n) and meet the requirements outlined in §§ 102.8(b), (c), (e), (f), (h), (i), (l), and (m).

In accordance with § 102.8(b), the following principles have been incorporated into the project design in accordance with the numbering in § 102.8(b): (1) The integrity of stream channels and the physical, biological, and chemical qualities of the receiving waters will remain unchanged. The site restoration principles will protect the existing and designated uses of the receiving waters. BMPs will be maintained until the site achieves stabilization during site restoration to ensure that runoff which leaves the project site will have no short-term adverse effects on the physical, biological, or chemical qualities of downstream receiving waters. The permanent seed mixture will restore the block valve site to a meadow condition. Geoweb will be utilized to mitigate the potential risk for compaction of topsoil on the block valve site. As a result, there will be no long-term effects to the physical, biological, or chemical qualities of downstream receiving waters. (2) Block valve sites will be graded, where necessary, to achieve usable slopes for equipment layout and vehicle access. The grading has been designed to utilize existing slopes in an effort to minimize grading. By minimizing grading, flow paths will only be minimally altered. The post development flow paths will slow the flow of runoff across the valve sites since grading will flatten existing slopes. The block valve will be seeded to achieve a meadow in good condition or better. As a result, post-development runoff rates to the nearest receiving water will not increase. (3) The block valves will be seeded to achieve a ground cover of a meadow in good condition or better. In addition, geoweb will ensure that void space and the infiltration capacity of the soil is maintained in the long term. As a result, any potential increase in stormwater runoff volume has been minimized to the maximum extent practicable. (4) This discussion relates to block valves which will be vegetated. The vegetated block valve sites do not have any proposed, impervious features associated with them. (5) Existing drainage features and vegetation will be protected by minimizing proposed grading. As a result, drainage features and existing vegetation surrounding the project area will be preserved to the maximum extent practicable. (6) Land clearing and grading will be minimized because the project area has been limited to the area required to safely install the natural gas pipelines. Grading at block valve sites has been minimized to the maximum extent practicable and has been designed to utilize existing slopes. (7) Soil compaction will be minimized by installing geoweb cellular confinement which will be filled with a mix of aggregate and topsoil. The geoweb will ensure that the void ratio and infiltration capacity of the soil is maintained, and the risk of compaction from vehicular traffic will be eliminated. The construction sequence and installation detail for geoweb specifies that care shall be taken so as not to compact the subgrade. (8) As demonstrated in 102.8(2) and 102.8(3), potential increases in post development stormwater runoff has been minimized to the maximum extent practicable utilizing nonstructural restoration BMPs.

In accordance with § 102.8(c), the mainline Site Restoration and Post Construction Stormwater Management Plan has been planned and designed and will be implemented in consistency with the E&S Plan.

In accordance with § 102.8(e), the Site Restoration and Post Construction Stormwater Management Plan has been prepared by Robert F. Simcik, P.E. who is trained and experienced in PCSM design methods and techniques applicable to the size and scope of the proposed project.

In accordance with § 102.8(f), the Site Restoration and Post Construction Stormwater Management Plan contains drawings and a narrative consistent with the requirements of Chapter 102. The Plan has been designed to minimize the threat to human health, safety, and the environment to the greatest extent practicable. The Plan includes the required information as outlined in § 102.8(f)(1) through § 102.8(f)(15).

In accordance with § 102.8(h), nondischarge alternatives for Special Protection waters are evaluated in the Antidegradation section of the Site Restoration and Post Construction Stormwater Management Plan. The Plan includes ABACT BMPs where nondischarge alternatives do not exist for the project.

In accordance with § 102.8(i), the applicant has submitted the Site Restoration and Post Construction Stormwater Management Plan to the applicable county conservation districts and Department of Environmental Protection for review and approval. Upon complaint or site inspection, the Plan will be available for subsequent review and inspection by the reviewing agencies.

In accordance with § 102.8(l), the permittee will include with the notice of termination "Record Drawings" with a final certification statement from a licensed professional, which reads as follows:

"I (name) do hereby certify pursuant to the penalties of 18 Pa.C.S.A. § 4904 to the best of my knowledge, information and belief, that the accompanying record drawings accurately reflect the as-built conditions, are true and correct, and are in conformance with Chapter 102 of the rules and regulations of the Department of Environmental Protection and that the project site was constructed in accordance with the approved PCSM Plan, all approved plan changes and accepted construction practices."

In accordance with § 102.8(m), the Site Restoration and Post Construction Stormwater Management Plan identifies that the permittee shall be responsible for long-term operation and maintenance of PCSM BMPs associated with permanent surface sites. However, there are no PCSM BMPs associated with vegetated block valve sites.

4.1 BMP DESCRIPTION NARRATIVE AND CONSTRUCTION SEQUENCE

All five proposed block valve facilities are proposed to be vegetated to meadow condition or better. Therefore, no post construction BMPs are required. Two additional existing sites will be utilized, but no expansion of the impervious area is proposed. Soil amendment and restoration may be required in areas where soil is compacted following construction activities.

Soil Amendment and Restoration

Soil amendment and restoration is the process of improving disturbed soils and low organic soils by restoring soil porosity and adding a soil amendment, such as compost, for the purpose of reestablishing the soil's long-term capacity for infiltration and pollution removal.

Construction Sequence

Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.

Soil Amendment and Restoration

1. Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.
2. In the designated soil amendment area, till the ground and mix in the compost at a ratio of 2:1 (soil:compost) to a depth of 24 inches. This is a critical step of the sequence which requires oversight by a licensed professional.
3. Immediately seed and mulch disturbed areas once final grade is established in accordance with the permanent seeding schedule.
4. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70% perennial vegetative cover is established.

Permanent Seeding

Site preparation and establishment of permanent cover in areas other than lawns will be conducted according to the following guidelines:

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SLOPES AND BANKS (NOT MOWED) WELL-DRAINED VARIABLE DRAINAGE	1 PLUS 1 PLUS	3, 5, 8, OR 12 (1) 3 OR 7
SLOPES AND BANKS (MOWED) WELL-DRAINED	1 PLUS	2 OR 10
SLOPES AND BANKS (GRAZED/HAY) WELL-DRAINED	1 PLUS	2,3, OR 13
GULLIES AND ERODED AREAS	1 PLUS	3, 5, 7, OR 12 (1)
EROSION CONTROL FACILITIES (BMPS) SOD WATERWAYS, SPILLWAYS, FREQUENT WATER FLOW AREAS DRAINAGE DITCHES SHALLOW, LESS THAN THREE FEET DEEP DEEP, NOT MOWED POND BANKS, DIKES, LEVEES, DAMS, DIVERSION CHANNELS, AND OCCASIONAL WATER FLOW AREAS	1 PLUS 1 PLUS 1 PLUS	2, 3, OR 4 2, 3, OR 4 5 OR 7

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
MOWED AREAS	1 PLUS	2 OR 3
NON-MOWED AREAS	1 PLUS	5 OR 7
FOR HAY OR SILAGE ON DIVERSION CHANNELS AND OCCASIONAL WATER FLOW AREAS	1 PLUS	3 OR 13
HIGHWAYS		
NON-MOWED AREAS		
WELL-DRAINED	1 PLUS	5, 7, 8, OR 10
VARIABLE DRAINED	1 PLUS	3 OR 7
POORLY DRAINED	1 PLUS	3
AREAS MOWED SEVERAL TIMES PER YEAR	1 PLUS	2, 3, OR 10
UTILITY ROW		
WELL-DRAINED	1 PLUS	5, 8, OR 12 (1)
VARIABLE DRAINED	1 PLUS	3 OR 7
WELL-DRAINED AREAS FOR GRAZING/HAY	1 PLUS	2, 3, OR 13
EFFLUENT DISPOSAL AREAS	1 PLUS	3 OR 4
SANITARY LANDFILLS	1 PLUS	3, 5, 7, 11 (1), OR 12 (1)
SURFACE MINES		
SPOILS, MINE WASTES, FLY ASH, SLAG, SETTLING BASIN RESIDUES AND OTHER SEVERELY DISTURBED AREAS (LIME TO SOIL TEST)	1 PLUS	3, 4, 5, 7, 8, 11 (1) OR 12(1)
SEVERELY DISTURBED AREAS FOR GRAZING/HAY	1 PLUS	3 OR 13
LAWN	1 PLUS	PENNDOT Formula B

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	SPECIES	SEEDING RATES – PLS (1)	
		MOST SITES	ADVERSE SITES (8)
1 (2)	spring oats (spring), or 64 96	64	96
	annual ryegrass (spring or fall), or	10	15
	winter wheat (fall), or	90	120
2 (3)	winter rye (fall)	56	112
	tall fescue, or 75	60	75
	fine fescue, or 40	35	40
	kentucky bluegrass, plus 25 30	25	30
	redtop(4), or	3	3
3	perennial ryegrass	15	20
	birdsfoot trefoil, plus 6 10	6	10
4	tall fescue	30	35
	birdsfoot trefoil, plus	6	10
5 (5)	reed canarygrass	10	15
	Big Bluestem, plus	10	15
6 (5,6)	tall fescue, or	20	25
	perennial ryegrass	20	25
7 (5)	Big Bluestem, plus	10	15
	annual ryegrass	20	25
8	birdsfoot trefoil, plus	20	30
	Big Bluestem, plus	20	30
	tall fescue	20	25
8	flatpea, plus	20	30
	tall fescue, or	20	30

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	SPECIES	SEEDING RATES – PLS (1)	
		MOST SITES	ADVERSE SITES (8)
9	perennial ryegrass	20	25
	Not applicable to project	N/A	N/A
10	tall fescue, plus	40	60
	fine fescue	10	15
11	deertongue, plus	15	20
	birdsfoot trefoil	6	10
12(7)	switchgrass, or	15	20
	big bluestem, plus	15	20
13	birdsfoot trefoil	6	10
	orchardgrass, or	20	30
	smooth bromegrass, plus	25	35
	birdsfoot trefoil	6	10

1. Pure live seed (pls) is the product of the percentage of pure seed times percentage germination divided by 100. For example, to secure the actual planting rate for switchgrass, divide 12 pounds pls shown on the seed tag. Thus, if the pls content of a given seed lot is 35 percent, divide 12 pls by 0.35 to obtain 34.3 pounds of seed required to plant one-acre. All mixtures in this table are shown in terms of pls.
2. If high-quality seed is used, for most sites seed spring oats at a rate of two bushels per acre, winter wheat at 11.5 bushels per acre, and winter rye at one bushel per acre. If germination is below 90 percent, increase these suggested seeding rates by 0.5 bushel per acre.
3. This mixture is suitable for frequent mowing. Do not cut shorter than 4 inches.
4. Keep seeding rate to that recommended in table. These species have many seeds per pound and are very competitive. To seed small quantities of small seeds such as weeping lovegrass and redtop, dilute with dry sawdust, sand, rice hulls, buckwheat hulls, etc.
5. Note not applicable because the project does not propose the use of Crownvetch.
6. Use for highway slopes and similar sites where the desired species after establishment is Big Bluestem.
7. Do not mow shorter than 9 to 10 inches.
8. If liming, fertilization, and preparation of seedbed are properly done and if care is taken to drill and cover the seed (or mulch applied), the rate for “most sites” should suffice. However, on eroded or coarse and poorly prepared seedbeds, particularly if the soil is very acidic or infertile, the rate for “adverse sites” should be used.
9. For seed mixtures 11 and 12, only use spring oats or weeping lovegrass (included in mix) as nurse crop.

In lawn areas, permanent cover will be established using the following PENNDOT seed mixture:

PENNDOT FORMULA B				
Seeding Rate	3 lbs. per 1,000 square feet			
Species	% by Weight	Purity %	Minimum % Germination	Maximum % Weed Seed
Kentucky Bluegrass	50	98	80	0.20
Perennial Rye	20	98	90	0.15
Red Fescue	30	98	85	0.15

Liming Rates

Minimum 6 tons per acre at 100% effective neutralizing value (% ENV), unless the soil test determines that a lesser amount is needed. To determine the actual amount of regular lime to apply, divide the amount called for by the soil test by the % ENV for the product used. For example, if 6 tons per acre is needed and the %ENV for the lime used is 88%, divide 6 by 0.88 resulting in 6.8 tons needing to be applied. For dolomitic lime, which has a significant amount of magnesium in it, divide the amount called for by the soil test by the % calcium carbonate equivalent (% CCE) listed for the product instead of the % ENV. The % CCE may be above 100% which accounts for the fact that magnesium has a greater effect per pound than the calcium in regular lime. Note: When a soil test requires more than 8,000 pounds of lime per acre, the lime must be mixed into the top 6 inches of soil.

Fertilization Rates

Apply 10-20-20 at 600 pounds/acre, if top dressed or 1,000 pounds/ac, if incorporated, unless the soil test determines that the rate can be less than these minimums.

SOIL AMENDMENT APPLICATION RATE EQUIVALENTS				
Soil Amendment	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yds.	
AGRICULTURAL LIME	6 TONS	240 LBS.	240 LBS.	or as per soil test; may not be required in agricultural fields
10-20-20 FERTILIZER	1,000 LBS.	25 LBS.	25 LBS.	or as per soil test; may not be required in agricultural fields

Temporary Seeding

Temporary grass cover will be established where soil stockpiles are exposed for a period greater than 4 days. The seed mixture for temporary cover will consist of 100% annual ryegrass. Seed will be applied at the rate of 40 pounds per acre or as recommended by a local recognized seed supplier approved by the Owner's representative. Prior to seeding, apply 1 ton of agricultural grade limestone per acre plus 10-10-10 fertilizer at the rate of 500 pounds per acre and work into the soil.

Mulching

The purpose of mulch is to reduce runoff and erosion, prevent surface compaction or crusting, conserve moisture, aid in establishing plant cover, and control weeds. Mulch will be applied on any area subject to erosion or that has unfavorable conditions for plant establishment and growth. The practice may be used alone or in conjunction with other structural and vegetative conservation practices such as waterways, ponds, sedimentation traps, or critical area planting. On sediment-producing areas where the period of exposure is less than two (2) months, mulch materials will be applied according to the following guidelines:

1. Straw mulch will be applied at the rate of 3 tons per acre. Chemically treated or salted straw is not acceptable as mulch.
2. Straw mulch will be anchored immediately after application by at least one of the following methods:
 - a. "Crimped" into the soil using tractor-drawn equipment (straight-bladed coulter or similar).

This method is limited to slopes no steeper than 3:1. Machinery should be operated on the contour. (Crimping of hay or straw by running it over with tracked machinery is not recommended.)

- b. Asphalt, either emulsified or cut-back, containing no solvents or other diluting agents toxic to plant or animal life, uniformly applied at the rate of 31 gallons per 1,000 square feet.
 - c. Synthetic binders (chemical binders) may be used as recommended by the manufacturer to anchor mulch provided that sufficient documentation is provided to show that it is non-toxic to native plant and animal species.
 - d. Lightweight plastic, fiber, or paper nets may be stapled over the mulch according to the manufacturer's recommendations.

Mulched areas will be checked periodically and after each runoff event (e.g., rain, snowmelt, etc.) for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

4.2 MATERIAL RECYCLING AND DISPOSAL

The operator will remove from the site, recycle, or dispose of all building materials and wastes in accordance with PADEP's solid waste management regulations at 25 Pennsylvania Code 260.1 et seq., 271.1 et seq., and 287.1 et seq. The contractor will not illegally bury, dump, or discharge building material or wastes at the site. Excess material brought into the site areas to facilitate construction access will be completely removed prior to rough grading and final surface stabilization. In cases where disposal is necessary, waste materials will be disposed of at an approved PADEP waste site.

4.3 THERMAL IMPACTS

Thermal impacts are most commonly associated with urbanization (i.e., increased impervious surfaces) that results in heated stormwater runoff flowing into receiving waters where it mixes, and potentially increases the base temperature of the surface water in streams. However, another contributing factor for stream temperature is solar exposure (radiant energy input) to the surface water, typically ponded, standing waters. The amount of heat transferred, and the degree of thermal pollution is of importance for fisheries management and the ecological integrity of receiving waters. Among the attributes that determine the contribution of solar energy to thermal impacts are the presence of riparian vegetation, as well as stream width, depth, flow regime (perennial, intermittent, ephemeral), and orientation.

No permanent gravel block valve facilities are proposed in the South East region. All proposed block valve sites will be vegetated and reinforced with Geoweb to promote infiltration or utilize existing impervious areas. Vegetated block valve sites will be returned to meadow condition or better following construction. There are no thermal impacts for any of these block valve facilities.

4.4 RIPARIAN FOREST BUFFERS

Pennsylvania Pipeline Project - Riparian Forest Buffer Waiver Request

The Pennsylvania Pipeline Project qualifies for an exception of the riparian forest buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area. Existing riparian forest buffers within the project area are identified on the E&S plan drawings in Attachment 2 of the E&S Plan.

In addition to the exception, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area. A detailed riparian buffer waiver request has also been prepared and is included as an attachment to the ESCGP-2 Notice of Intent.

Demonstration of Waiver Necessity

A riparian forest buffer waiver is necessary to complete the intended scope of the pipeline project. The project involves the installation of approximately two parallel pipelines within a 306-mile, 50-foot-wide ROW from Houston, Washington County, PA to SPLP's Marcus Hook facility in Delaware County, PA with the purpose of

interconnecting with existing SPLP Mariner East pipelines. A 20-inch diameter pipeline would be installed within the ROW from Houston to Marcus Hook (306 miles) and a second, 16-inch diameter pipeline, will also be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, PA to the Marcus Hook facility, paralleling the initial line for approximately 255 miles. Spreads 3, 4, and 5 (South Central Region) of this project are cross through Blair, Huntingdon, Juniata, Perry, Cumberland, York, Dauphin, Lebanon, Lancaster, and Berks Counties, PA. Due to the linear nature of the project and the surrounding topography, riparian forest buffers could not be avoided altogether.

Alternatives Analysis

Impacts to environmental resources, including riparian forest buffers, were evaluated during the pipeline routing phase of the project. Field teams were deployed to evaluate alternate routes based on environmental and constructability constraints. The final route that was selected minimizes environmental impacts to the maximum extent practicable while still maintaining the project's overall constructability and ensuring a safe working environment while also taking landowner constraints into consideration. Additionally, several variations of horizontal direction drill profiles were evaluated to minimize pullback areas, additional workspaces, and overall disturbance within riparian forest buffers. Permanent features, such as access roads and block valves, were evaluated to locate the features outside of the riparian forest buffer, where possible.

Demonstration of Minimizing Impacts

All disturbance activities, including those which impact riparian forest buffers, have been reduced to the maximum extent practicable. The LOD has been reduced to 50 feet wide at all stream crossings within the riparian forest buffer area where possible adjacent to the stream area required for crossing and construction. In areas where it is not practicable to reduce the LOD throughout the entire extent of the riparian forest buffer, the LOD has been reduced to 50 feet wide within 10 feet of the stream banks to limit the proximity of the work areas as per the stream crossing detail from the 2012 PADEP Erosion and Sediment Pollution Control Program Manual. The operations within the LOD near stream crossings typically includes a topsoil stockpile, a stockpile for pipe trench excavation material, a pipe trench, a travel lane, a work area for equipment operation and pipeline welding outside the trench, and an area to install the erosion control BMPs. In addition, site conditions such as steep slopes, varying depths of topsoil, and other on-site conditions limit the amount of work area. Reducing the LOD to a greater extent could potentially result in unsafe working conditions and would hinder the ability to complete the stream crossing within the required time frame of 24 hours or less. Workspaces that provide additional space for stream crossing activities have been placed outside of riparian forest buffers where possible. The post construction stormwater management infiltration berms and trenches are not located within riparian forested buffers.

Meeting Requirements of Chapter 102

All other aspects of Chapter 102 are being met. The project's E&SC Plan and SR/Post-Construction Stormwater Management Plan have been designed in accordance with Chapter 102. In accordance with Chapter 102, and E&S plan has been developed to minimize the sediment entering the buffer areas. The post construction stormwater management plan has been design to control runoff rate and volume which may be discharge through riparian buffer areas.

4.5 INSPECTION AND MAINTENANCE PROCEDURES

Long-term maintenance of the pipeline ROW will include periodic visual inspections for sufficient vegetative growth and cover. Insufficient vegetative cover is defined as any area not achieving a uniform 70-percent perennial vegetative cover. Bare spots and areas with insufficient vegetative cover will be reseeded and mulched within 24 hours of discovery. The ROW will be inspected for signs of erosion, especially on steep slopes. Corrective measures will be taken, as needed. If there is evidence of trench settling, the area will be regraded to maintain pre-construction drainage patterns, mulched, and seeded. A written report is required for each inspection and for each repair or maintenance activity, and the report should specify how to access the site. SPLP is responsible for maintaining the ROW under the provisions of this permit.

Permanent proposed access roads and valve pads will be constructed as part of the project. These access roads and block valve pads will be vegetated after construction to promote infiltration and reduce runoff. The sites will be inspected periodically.

In areas where vegetated Geoweb is installed, in addition to inspecting the vegetation coverage, the Geoweb will be inspected for signs of damage affecting Geoweb performance, e.g., displaced cells or significantly torn cells. If the infill topsoil/aggregate mix settles over time and exposes the Geoweb, it will be filled with the same infill mixture and re-seeded. Note that with age, it is not unusual that the top of the Geoweb sections may become exposed and trampled with use. This does not affect the performance of the cellular confinement. If Geoweb becomes torn, it will be repaired. If the Geoweb becomes exposed it will be filled with the same infill mixture and re-seeded.

Inspection and maintenance procedures for permanent post-construction stormwater management facilities and stormwater conveyance BMPs are summarized below. If any post-construction stormwater management facilities are constructed prior to stabilization of upslope contributory drainage areas, inspections shall occur weekly and after runoff events until the surrounding area achieves stabilization. Sites located within karst terrain require more frequent long-term inspections, as specified in the Sinkhole Repair Plan in Attachment 2.

After stabilization has occurred the PCSM BMPs will continue to be inspected by Sunoco Operations in accordance with 25 Pa. Code 10-2.8(m) related to PCSM long-term operation and maintenance requirements and recorded in the Post Construction Stormwater Management Instrument Filling completed for each valve site that has a PCSM BMP.

Soil Amendment and Restoration

- The soil restoration process may need to be repeated over time, due to compaction by use and/or settling.
- Soil amendment areas shall be inspected at least 4 times per year for signs of compaction. To remedy compaction, till the soil to a depth of 24 inches and mix in compost at a ratio of 2:1 (soil:compost).

4.6 ANTIDegradation Requirements

Portions of the earth disturbance activities associated with the SPPP will be located within a HQ/EV watershed. A combination of non-discharge alternatives and the use of ABACT BMPs will be implemented to protect and maintain the existing water quality of the receiving waters.

Non-discharge alternatives were evaluated to minimize accelerated E&S and achieve zero net change in runoff between the pre and post-construction conditions. Non-discharge alternatives exist when the existing land use is revegetated and grade is restored therefore no increase in runoff rate or volume from pre to post construction results. Other non-discharge alternatives implemented are limiting and minimizing the extent of disturbed areas and limiting the extent and duration of disturbance (phasing and sequencing) then stabilizing disturbed areas as soon as practicable. ABACT BMPs will be used onsite to protect and maintain the existing water quality of receiving waters also in areas where non-discharge alternatives exist.

There are no sites that require post-construction stormwater management within special protection watersheds in the South East region. See section 3.6 for additional discussion related to Antidegradation Requirements during Site Restoration.

4.7 Stormwater Runoff Analysis

Five new block valve locations are proposed for the PADEP Southeast Region portion of the PPP project. Two additional block valves are proposed at existing sites, Elverson Interchange and Eagle Station, and do not expand the current impervious footprint or require grading. All five of the new block valve sites will be vegetated, so they will not require PCSM.

The access roads and gravel pads will remain as a permanent facility after pipeline construction is complete. No PCSM design is required because no permanent impervious facilities are proposed. There is no increase in the stormwater runoff rate for the 24-hour duration, 2-, 10-, 50-, and 100-year storm events as a result of the access road and valve site construction.

Karst Topography

The East Lincoln Highway block valve site is believed to be within a 1.5-mile radius of documented sinkholes or depressions (source: <http://www.gis.dcnr.state.pa.us/maps/>)

Due to the risks associated with constructing stormwater facilities within karst terrain, several principles were employed to reduce the risk of sinkholes while still making every attempt to infiltrate stormwater runoff. The following principles were considered in the design:

- Minimizing proposed impervious surfaces
- Avoiding concentrating stormwater runoff.

In addition, a Sinkhole Repair Plan is included in Attachment 2 in the event that a sinkhole develops onsite.

Loading Ratios

No permanent impervious area is proposed for any facility in the South East region. Therefore, no PCSM BMPs are proposed, and loading ratios do not apply.

Stormwater Rates and Volumes

No permanent impervious area is proposed for any facility in the South East region. Therefore, no PCSM BMPs are proposed, and stormwater rates and volumes do not apply.

5.0 REFERENCES

Erosion and Sediment Pollution Control Program Manual, Commonwealth of Pennsylvania, Department of Environmental Protection, Office of Water Management, March 2012.

Stormwater Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices, United States Environmental Protection Agency, Office of Water, 1993.

Pennsylvania Stormwater Best Management Practices Manual, Pennsylvania Department of Environmental Protection, Bureau of Watershed Management, December 2006.

Downingtown, Elverson, Pottstown, Washington, Malvern, West Chester, and Media Quadrangles, Pennsylvania – Chester County, Geological Survey, United States Department of Interior.

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