TETRA TECH

PITT-04-19-008

April 4, 2019

Project Number 212IC-BF-00037

Mr. Gregory Holesh, P.E.
Manager, Permitting & Technical Services
Waterways & Wetlands Program
Pennsylvania Department of Protection
400 Waterfront Drive
Pittsburgh, Pennsylvania 15222

Re: NPDES Permit No.: ESG0500015001-1
Incompleteness Review Responses
Pennsylvania Pipeline Project – Mariner East 2 Goldfinch Line HDD Reroute
Jackson Township, Cambria County

Dear Mr. Holesh:

On behalf of our client, Sunoco Pipeline L.P. (SPLP), Tetra Tech, Inc. is providing the following response to the Pennsylvania Department of Environmental Protection (DEP) Incompleteness Review letter dated March 20, 2019, regarding the above-referenced Chapter 102 Major Amendment. The supporting attachments represent clarifications or revisions to the original modification request. We are providing three hard copies and three CDs containing this letter and supporting attachments.

The following is the comment received and corresponding response.

Comments and Responses to March 20, 2019 Incompleteness Review Letter

1.	102.4(b)(5)(vii): The Erosion and Sediment Plans do not discuss how and when the E&S BMPs will be removed from the wetlands. Include a note in the E&S plans that the Compost Filter Socks will be removed once the site has been restored back to original conditions.	**Attachment A** of this response provides the updated plan sheets for ES-2.14, ES-15-RR-A, ES-15-RR-B, ES-15-RR-C, and ES-2.17. The figures were updated to include a note and show the proposed Compost Filter Sock within the wetlands and appropriate Erosion and Sediment control devises. Calculations to support the controls also provided. Maintenance and removal of erosion control devices is presented in the Narrative under Construction Sequence number 18 (pg 3-3) and applies to the wetland areas that are now included on the E&S plan sheets.

Tetra Tech, Inc.
661 Andersen Drive, Suite 200, Pittsburgh, PA 15220
Tel 412-921-7090 Fax 412-921-4040 tetratech.com

SPLP appreciates your timely review of this response. Should you have questions regarding this correspondence, please do not hesitate to contact me at 412-921-8163 or via e-mail at Robert.Simcik@tetratech.com.

Sincerely,

Robert F. Simcik, PE
Tetra Tech, Inc.

Enclosures: Attachment A

cc: File 212IC-PB-00387
D. Drake, PADEP Southwest Region
B. Blosoky, Cambria County Conservation District
M. Gordon, Sunoco Pipeline L.P.
C. Embry, Sunoco Pipeline L.P.
M. Styles, Sunoco Pipeline L.P.
L. Gremminger, Gremminger Associates, Inc.
B. Schaeffer, Tetra Tech

Attachment A

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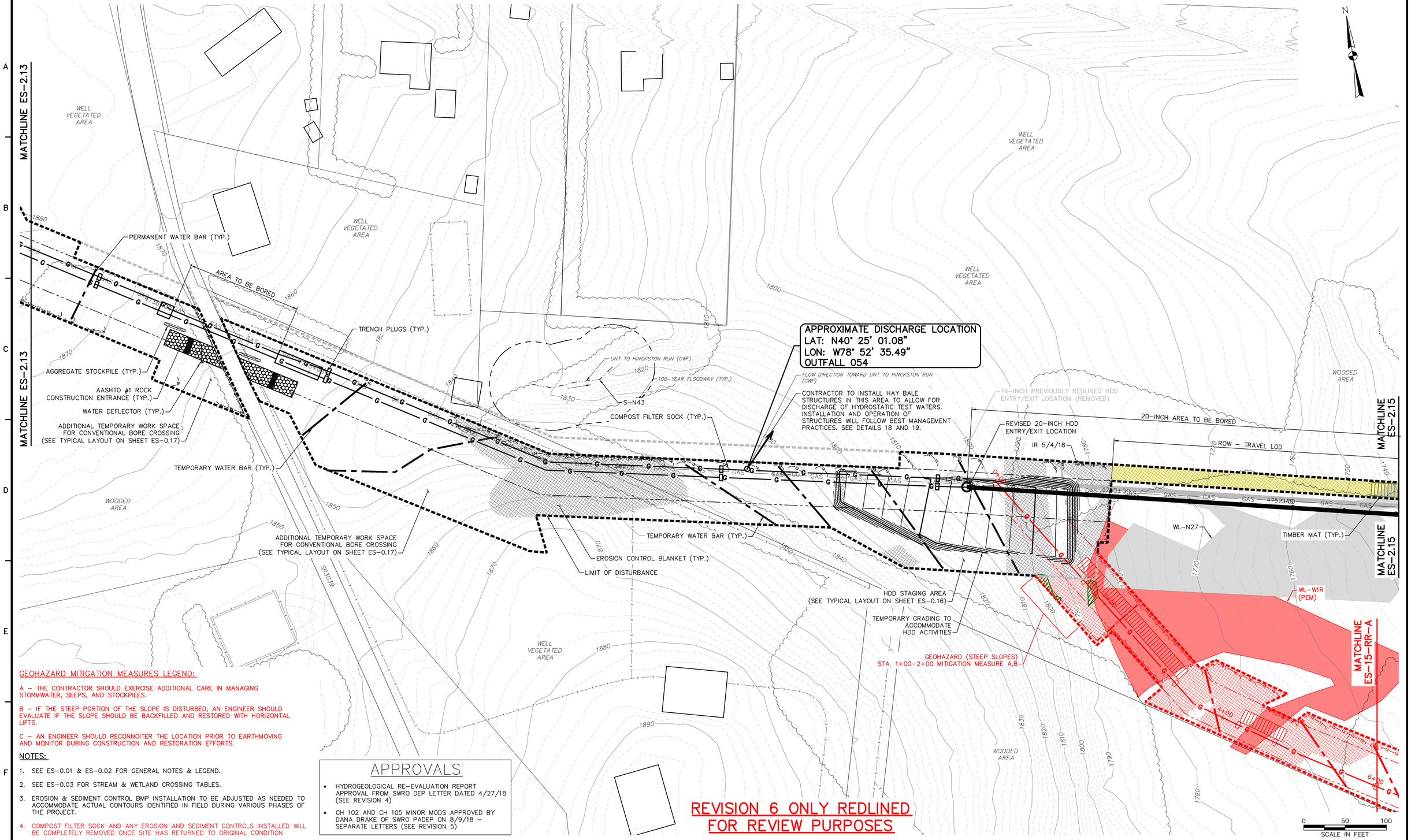

GEOHAZARD MITIGATION MEASURES LEGEND:

A – THE CONTRACTOR SHOULD EXERCISE ADDITIONAL CARE IN MANAGING STORMWATER, SEEPS, AND STOCKPILES.

B – IF THE STEEP PORTION OF THE SLOPE IS DISTURBED, AN ENGINEER SHOULD EVALUATE IF THE SLOPE SHOULD BE BACKFILLED AND RESTORED WITH HORIZONTAL LIFTS.

C – AN ENGINEER SHOULD RECONNOITER THE LOCATION PRIOR TO EARTHMOVING AND MONITOR DURING CONSTRUCTION AND RESTORATION EFFORTS.

NOTES:

1. SEE ES–0.01 & ES–0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES–0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.
4. COMPOST FILTER SOCK AND ANY EROSION AND SEDIMENT CONTROLS INSTALLED WILL BE COMPLETELY REMOVED ONCE SITE HAS RETURNED TO ORIGINAL CONDITION

APPROVALS

- HYDROGEOLOGICAL RE–EVALUATION REPORT APPROVAL FROM SWRO DEP LETTER DATED 4/27/18 (SEE REVISION 4)
- CH 102 AND CH 105 MINOR MODS APPROVED BY DANA DRAKE OF SWRO PADEP ON 8/9/18 – SEPARATE LETTERS (SEE REVISION 5)

REVISION 6 ONLY REDLINED FOR REVIEW PURPOSES

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REVISIONS			
NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	5/28/17	REVISED REDUCTION IN LOD BASED ON LANDOWNER AGREEMENT
4	RS	3/30/18	GOLDFINCH HDD EXTENSION ON EAST SIDE OF DRILL
5	RS	8/1/18	ADDED IR
6	RS	12/20/18	16–INCH RE–ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT CONSTRUCTION SPREAD 2

1–20" & 1–16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

CAMBRIA COUNTY CONSERVATION DISTRICT EROSION & SEDIMENT CONTROL & SITE RESTORATION PLAN SHEET 14 OF 75

DATE:	2/6/2017
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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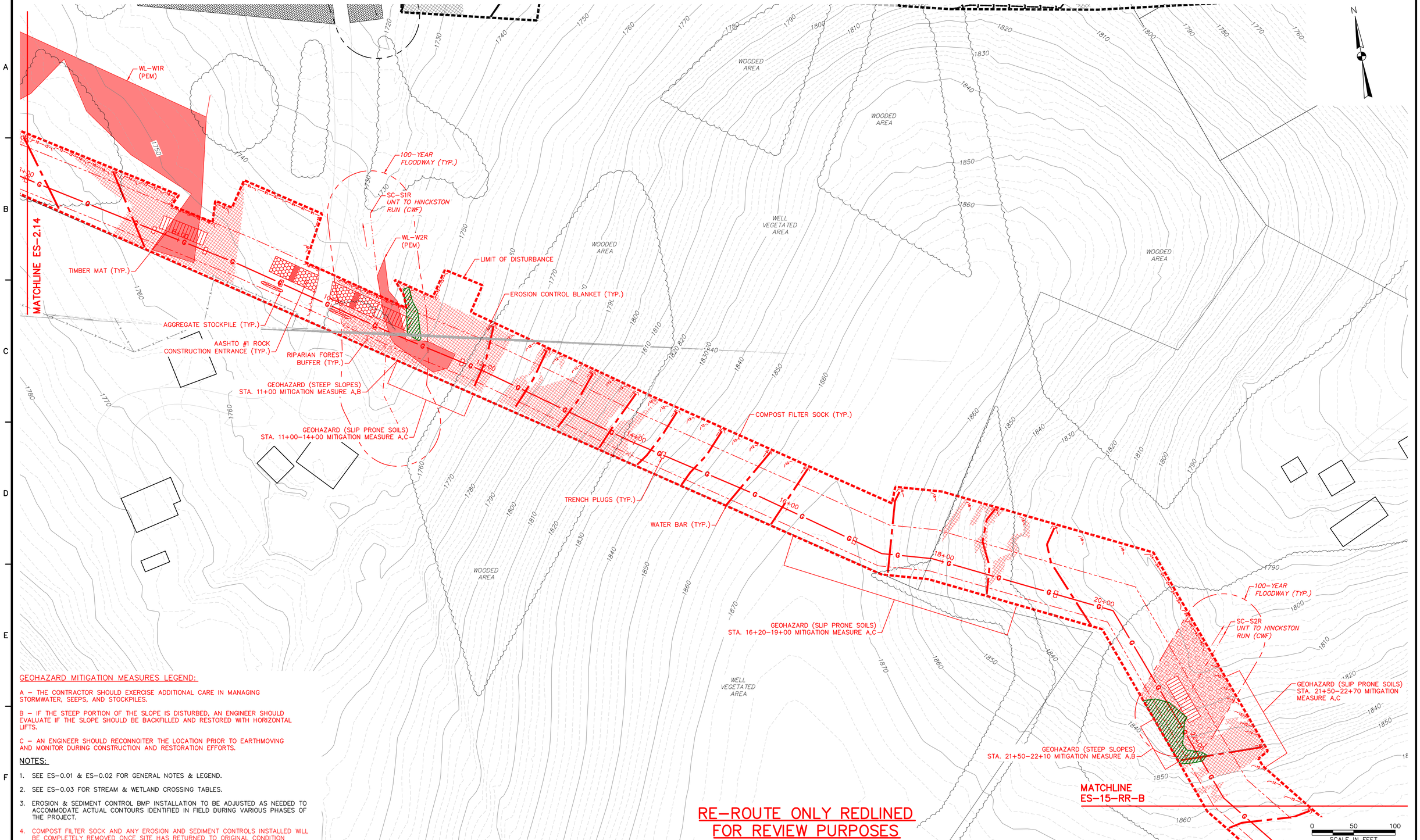
ES–2.14
SHEET 2.14 OF 102

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\5 – Cambria\E&S_Goldfinch MOD\5958ES002.14.dwg PIT NICHOLE.NAJESKI 3/28/2019 7:18:07 AM



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CAMBRIA COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
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SHEET 15 OF 75

DATE:	2/6/2017
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ES-15-RR-A
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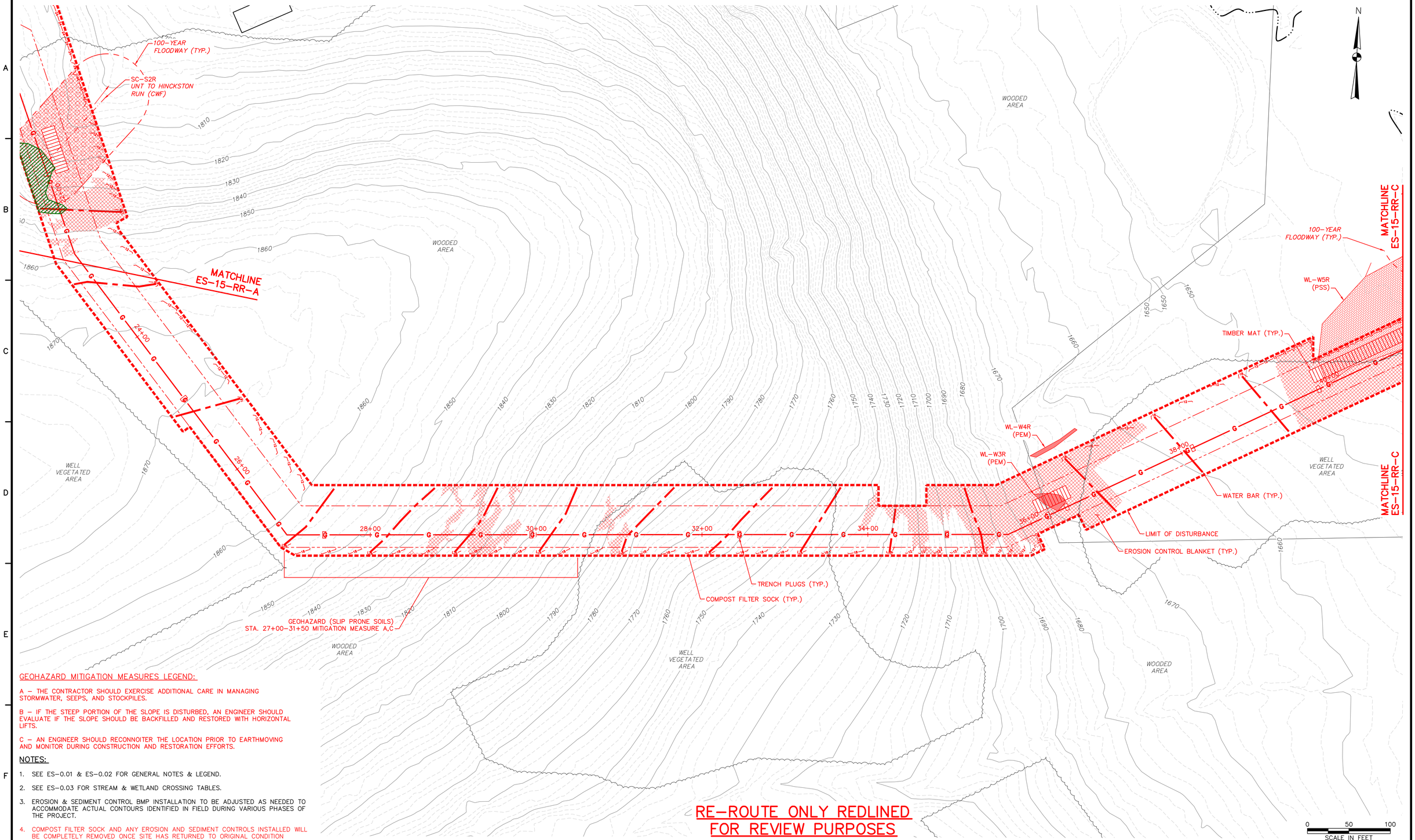

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ES-15-RR-B
SHEET 2.15 OF 102

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MATCHLINE ES-2.17

MATCHLINE ES-2.17

MATCHLINE ES-15-RR-B

MATCHLINE ES-15-RR-B

100-YEAR FLOODWAY (TYP.)

SC-S7R UNT TO HINCKSTON RUN (CWF)

WL-W9R (PSS)

100-YEAR FLOODWAY (TYP.)

WL-W8R (PSS)

SC-S6R UNT TO HINCKSTON RUN (CWF)

SC-S4R HINCKSTON RUN (CWF)

WL-W7R (PSS)

TIMBER MAT (TYP.)

SC-S3R UNT TO HINCKSTON RUN (CWF)

SC-S5R UNT TO HINCKSTON RUN (CWF)

WL-W6R (PSS)

EROSION CONTROL BLANKET (TYP.)

LIMIT OF DISTURBANCE

TRENCH PLUGS (TYP.)

COMPOST FILTER SOCK (TYP.)

WOODED AREA

WOODED AREA

WOODED AREA

WELL VEGETATED AREA

WELL VEGETATED AREA

WELL VEGETATED AREA

ROUTE 271

1640

1650

1660

42+00

44+00

164+50

N

0 50 100
SCALE IN FEET

GEOHAZARD MITIGATION MEASURES LEGEND:

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SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT CONSTRUCTION SPREAD 2

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CAMBRIA COUNTY CONSERVATION DISTRICT EROSION & SEDIMENT CONTROL & SITE RESTORATION PLAN SHEET 15 OF 75

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ES-15-RR-C

SHEET 2.15 OF 102

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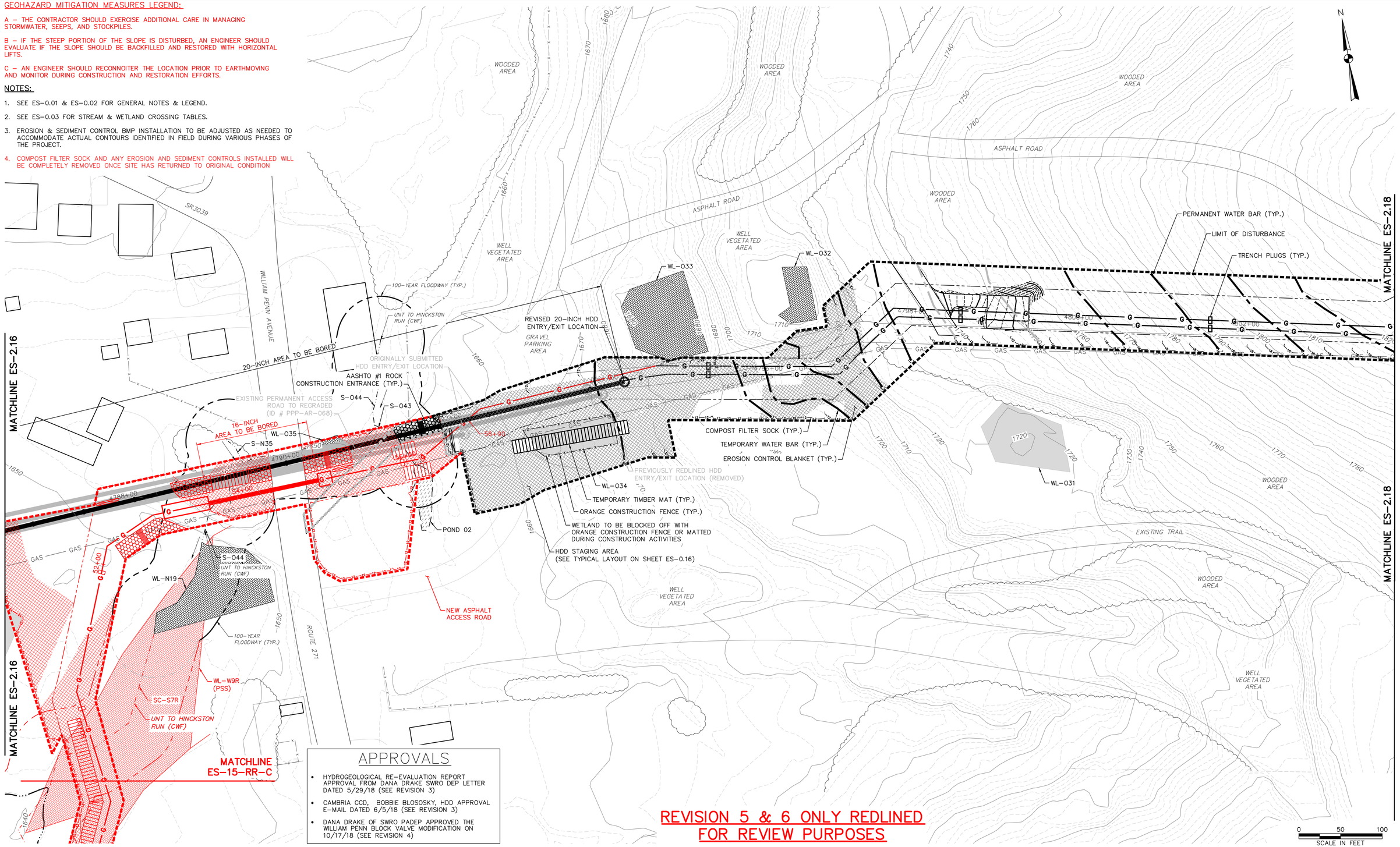

APPROVALS

- HYDROGEOLOGICAL RE-EVALUATION REPORT APPROVAL FROM DANA DRAKE SWRO DEP LETTER DATED 5/29/18 (SEE REVISION 3)
- CAMBRIA CCD, BOBBIE BLOSOSKY, HDD APPROVAL E-MAIL DATED 6/5/18 (SEE REVISION 3)
- DANA DRAKE OF SWRO PADEP APPROVED THE WILLIAM PENN BLOCK VALVE MODIFICATION ON 10/17/18 (SEE REVISION 4)

REVISION 5 & 6 ONLY REDLINED FOR REVIEW PURPOSES

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REVISIONS

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1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	5/21/18	WILLIAM PENN AVE REVISED HDD
4	RS	10/2/18	RELOCATED WILLIAM PENN AVE BLOCK VALVE
5	RS	1/11/19	16" RE-ROUTE & BORE ADDED

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

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CAMBRIA COUNTY CONSERVATION DISTRICT EROSION & SEDIMENT CONTROL & SITE RESTORATION PLAN SHEET 17 OF 75

DATE:	2/6/2017
PROJECT NO.:	112C05958
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ES-2.17
SHEET 2.17 OF 102

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STANDARD E&S WORKSHEET #1

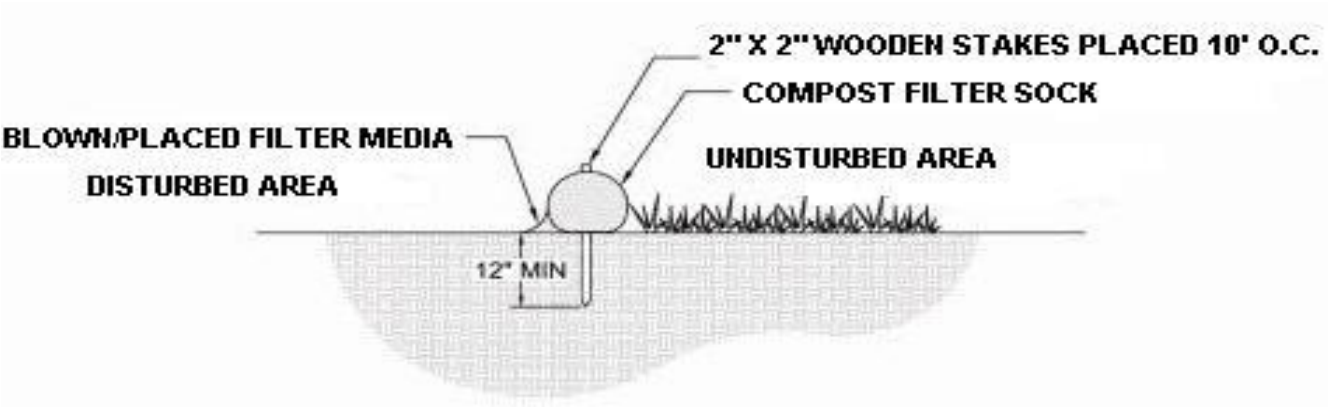
Compost Filter Socks

PROJECT NAME: Pennsylvania Pipeline Project Major Modification (supplement)

LOCATION: Cambria County

PREPARED BY: Rob Simcik DATE: 4/2/2019

CHECKED BY: Jacquelyn Body DATE: 4/2/2019



SOCK NO.	Dia. In.	LOCATION	SLOPE PERCENT	SLOPE LENGTH ABOVE BARRIER (FT)
1a	12	1+50 to 3+50	10	100
2a	12	4+50 to 5+00	11	100
3a	18	8+00 to 8+50	10	150
4a	18	10+50	15	100
5a	12	49+00 to 50+00	4	300

CLEAN WATER DIVERSION BERM CALCULATIONS

Clean Water Diversion Calculations

Diversion Berm Design Storms

According to the PADEP Erosion and Sediment Pollution Control Program Manual, temporary channels and berms must be designed to convey 1.6 cfs/acre or peak discharge from a 2-year/1-hour storm. Temporary channels in special protection watersheds must be designed to convey 2.25 cfs/acre or the peak discharge from a 5-year/1-hour storm.

The diversions were designed using the peak flow using the Rational Method. The intensity used in the peak flow calculations was based on a 2-year storm using Steel's Formula (for Region 3), which is located on page 114 of the E&S manual,

$$I = \frac{106}{(Tc + 17)}\ , in/hr$$

Typically when using the Rational Method, the time of concentration is used for the storm duration to produce a conservative (highest) intensity since this is the time it takes for the entire drainage area to contribute to the flow. Therefore, the peak flow for all diversions with a time of concentration of less than 60 minutes, will be greater than using the 2-year/1-hour storm for the rainfall intensity.

The rainfall intensity can also be found for specific locations using the National Oceanic and Atmospheric Administration Atlas 14. For example, the intensity for the 2-year/1-hour storm using Steel's Formula is,

$$I = \frac{106}{(60 + 17)} = 1.38\ in/hr$$

Compare this to the 2-year/1-hour rainfall intensity from NOAA Atlas 14 for western Pennsylvania in Washington County (1.18 in/hr) and eastern Pennsylvania in Delaware County (1.45 in/hr).

For special protection watersheds, the required design storm is the 5-year/1-hour storm if not using the multiplier. Using the Steel's Formula, the design intensity is

$$I = \frac{135}{(Tc + 19)} = \frac{135}{(60 + 19)} = 1.70\ in/hr$$

The intensity for the 2-year/1-hour storm from NOAA Atlas 14 ranges from 1.48 in/hr in western Pennsylvania to 1.80 in/hr in eastern Pennsylvania.

The 2-year return period storm was used for all of the runoff calculations. However, since the time of concentration was used for the storm duration, the vast majority of the diversions were designed conservatively compared to strictly using the 5-year/1-hour storm event. Since most of the drainage areas are relatively small, time of concentration values were typically between 5 minutes, which corresponds to an intensity of 4.8 in/hr and 35 minutes, which corresponds to an intensity of 2.03 in/hr. The intensities used can be found on the flow summary tables entitled

“TABLE FOR CALCULATING THE PEAK RUNOFF RATE FOR DRAINAGE PIPES USED FOR CLEAN WATER DIVERSIONS”. The calculations have been reviewed to identify if any intensity values were less than the 1.70 in/hr requirement. Revised tables have been provided that use an intensity of the greater of either the 2-year storm with the time of concentration as the duration or the 5-year/1-hour storm.

Level Spreader Design

The clean water diversions must discharge to a stabilized area. In order to prevent damage to downstream properties, the concentrated flow through the pipe must be returned to sheet flow prior to entering receiving waters.

According to the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual, drainage areas to earthen level spreaders must be limited to 1.0 acre. Due to the temporary nature of the work and lack of real estate and workspace, structural level spreaders are not feasible. Therefore, we have designed a more construction-friendly level spreader that will be adequate for the limited lifespan of the level spreader.

The clean water diversion will direct the clean runoff to a rock filter to slow the water and allow some filtering and infiltration. Once the water passes through the rock filter, it will enter a pipe that conveys the clean water across the workspace. In order to dissipate energy and return the concentrated flow to sheet flow, the pipe will be connected to a capped perforated pipe situated parallel to the contours. The level spreader will be wrapped with and placed on geotextile fabric for additional protection. AASHTO No. 1 Stone will be placed over the level spreader with a minimum stone depth over the pipe of 4-inches. Compost filter sock will be located up grade from the level spreader acting as a sediment barrier from the workspace. An 18-inch compost filter sock will also be placed down grade of the level spreader.

The pipe specification used was taken from the JM Eagle Technical Bulletin (Eagle Corr PE). A nominal pipe size of 12-inches was chosen in order to be used for a wide range of flows. The 12-inch perforated pipe has circular perforations with a diameter of 0.375 inches. There are six (6) rows of perforations for the 12-inch pipe which corresponds to a nominal water inlet area of 4.10 in^2/ft.

The orifice flow equation, $Q = C_d A_o (2gh)^{1/2}$, is used to find the flow through an orifice. The six (6) openings per row is known. Using the nominal water inlet area, the spacing of the rows is calculated and then turned into a $ft^3/s/ft$ value based on the number of openings. The peak flow for a diversion is known from the diversion calculations and then a length of level spreader is calculated based on the available static head, the elevation difference across the workspace.

All lengths were then rounded up to the next multiple of 5 feet. The minimum level spreader length was also 5 feet.

After construction and once the disturbed area tributary to the compost filter sock in the vicinity is permanently stabilized with vegetation, the diversions and level spreaders will be removed along with other erosion and sedimentation control BMPs.

Cambria County
Temporary Diversion Berm Calculation
Goldfinch Major Modification

Station	Roughness Coefficient	Channel Slope (ft/ft)	Normal Depth (ft)	Left Side Slope (ft/ft(H:V))	Right Side Slope (ft/ft(H:V))	Drainage Area (acres)	Discharge (ft^3/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)	Critical Depth (ft)	Critical Slope (ft/ft)	Velocity (ft/s)	Velocity Head (ft)	Specific Energy (ft)	Fouude Number	Flow Type
1+00 through 2+25	0.03	0.111	0.34	3	1	0.69	1.104	0.24	1.57	0.15	1.38	0.45	0.026	4.67	0.34	0.68	1.98	Super

Cambria County

Temporary Perforated Pipe Level Spreader Calculations

Goldfinch Major Modification

Station	Discharge (ft^3/s)	Available Static Head (ft)	Pipe Diameter (in)	Perforation Diameter (in)	Perforations per Row	Orifice Area per Foot (sq.in./ft)	Row Spacing (in)	Orifice Coeff. (Cd)	Level Spreader Capacity (ft^3/s/ft)	Required Length (ft)	Nominal Length (ft)	Level Spreader Capacity (ft^3/s)
1+00 through 2+25	1.104	9	12	0.375	6	4.1	1.94	0.61	0.418	2.64	5	2.091

Worksheet for Sta 4750+00

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.11100	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	1.00	ft/ft (H:V)
Discharge	1.10	ft^3/s

Results

Normal Depth	0.34	ft
Flow Area	0.24	ft^2
Wetted Perimeter	1.57	ft
Hydraulic Radius	0.15	ft
Top Width	1.38	ft
Critical Depth	0.45	ft
Critical Slope	0.02576	ft/ft
Velocity	4.67	ft/s
Velocity Head	0.34	ft
Specific Energy	0.68	ft
Froude Number	1.98	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.34	ft
Critical Depth	0.45	ft
Channel Slope	0.11100	ft/ft
Critical Slope	0.02576	ft/ft