

Off Site Discharge Analysis

Pennsylvania Pipeline Project

February 2017

Prepared for:

Sunoco Pipeline, L.P.
525 Fritztown Road
Sinking Spring, PA 19608



Prepared by:

Tetra Tech, Inc.
661 Andersen Drive
Pittsburgh, PA 15220



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LIST OF ACRONYMS

ACRONYM	MEANING
BMPs	Best management practices
E&SC	Erosion and sediment control
LOD	Limit of disturbance
PADEP	Pennsylvania Department of Environmental Protection
PCSM	Post-Construction Stormwater Management
PPP	Pennsylvania Pipeline Project
ROW	Right-of-way
Tt	Tetra Tech, Inc.
UNT	Unnamed tributary

INTRODUCTION

Pennsylvania Pipeline Project involves the installation of two parallel pipelines within a 306-mile, 50-footwide right-of-way (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.

OFFSITE ANALYSIS

Attached is a summary spreadsheet and associated figures for offsite discharges associated with the Sunoco Logistics, L.P. Pennsylvania Pipeline Project. The spreadsheets and figures are used to demonstrate there are no adverse effects to downstream properties.

The spreadsheet is broken in to several key components. The first three columns are the main descriptors of the discharge. This includes the site name associated the discharge, the discharge name within that site, and where the point discharges to. If the runoff is discharged to a surface water (wetland, stream, lake, etc) or to an existing storm system, no further analysis was needed.

If the site discharges to a non-surface water, a level spreader was designed. To design for the level spreader a post-developed rate during the 100 year storm was used. The level spreader length is 1 foot per 1 cfs during the 100 year storm. Or the level spreader was designed based off drainage area with a 5 feet per acre of drainage area. This is the minimum required length and in all instances a design length larger than the required will be used. This drainage area is also necessary because any level spreader with an area greater than 1 acre must be a structural level spreader instead of an earthen level spreader.

The last component of the spreadsheet is the volume differential for the 2 year storm as well as the rate differential for storms 2 year through 100 year. Clean water diversion with a properly sized level spreader will not cause any adverse effects to adjoining because conditions are the same before and after construction activities. These numbers lead to a final analysis conclusion. For each post-developed discharge, the volume and rate are less than or equal to the pre-developed discharge and the level spreader is properly sized to return runoff to sheet flow conditions so that no adverse effects will occur to downstream properties.

Monitoring at each discharge location will consist of the following:

- a. Document existing conditions by taking preconstruction photographs
- b. Monitor the condition of the channel or swale during routine Erosion & Sedimentation Control and Post Construction Stormwater Management BMP inspections.
- c. If erosion occurs, prepare a corrective action plan for the PADEP's review and approval
- d. Implement the approved plan.
- e. Submit a corrective action plan report to PADEP:

Site Name	Discharge Name	Discharge Point	2- YR Discharge Vol. @ POI		2- YR Peak Discharge @ POI		10- YR Peak Discharge @ POI		50- YR Peak Discharge @ POI		100- YR Peak Discharge @ POI		Drainage Area @ POI (acres)	Level Spreader Length (L)			Notes
			Pre (ac-ft)	Post (ac-ft)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)		Pre (cfs)	Post (cfs)	Design Basis	
Delmont Station	LS-01	Ditch	0.107	0.057	1.93	0.13	3.39	1.22	4.54	2.62	5	3.01	1.1	Flow Rate	3.01	10	
	LS-02	Offsite	0.251	0	4.51	0	9.09	0.18	13.02	0.51	14.64	0.73	3.1	Flow Rate	0.73	10	
	12" HDPE to NW	Storm System	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	RA-01	Stream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	RA-02	Stream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ebensburg Station	OP-1	Ditch	0.222	0.086	2.31	1.01	5.51	3.46	7.54	5.47	9.39	7.09	2.1	N/A	N/A	N/A	
	OP-2	Ditch	0.082	0.089	1.33	1.54	3.36	3.29	4.69	4.36	5.91	5.32	1.1	N/A	N/A	N/A	PennDOT has approved a driveway permit for the station that included discharge OP-02.
Mt. Union Station	Level Spreader	Storm System	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Level Spreader	Offsite	0.009	0	0.08	0	0.44	0.12	1.07	0.57	1.44	0.85	0.6	Drainage Area	3.16	5	
Doylestown Station	LS-Diversion 01	Ditch	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	27.64	27.64	7.4	Flow Rate	27.64	30	Clean Water Diversion
	LS-Diversion 02	Ditch	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.97	10.97	2.2	Flow Rate	10.97	26	Clean Water Diversion
Beckersville Station	Unnamed Trib #62107	Stream	0.278	0.233	1.620	0.140	6.120	0.560	11.200	1.070	14.450	1.390	N/A	N/A	N/A	N/A	
	Unnamed Trib #62107	Stream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.590	0.6	Flow Rate	2.59	5	Clean Water Diversion
Middletown Station	Unnamed Trib Swatara Creek	Stream	0.136	0.113	0.920	0.160	4.980	0.620	13.020	1.590	18.010	2.590	N/A	N/A	N/A	N/A	
	Unnamed Trib Swatara Creek	Stream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.490	1.1	Flow Rate	2.49	20	Clean Water Diversion
	Wetland CC32	Wetland	0.021	0.005	0.090	0.000	0.490	0.000	1.270	0.220	1.760	1.080	N/A	N/A	N/A	N/A	
	Wetland CC32	Wetland	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Clean Water Diversion
	Unnamed Trib Swatara Creek	Stream	0.029	0.023	0.190	0.100	0.990	0.900	2.580	2.350	3.570	3.190	N/A	N/A	N/A	N/A	
	Unnamed Trib Swatara Creek	Stream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.770	1.2	Flow Rate	2.77	20	Clean Water Diversion
Charger	Slow Release 1	Offsite	0.019	0.008	0.353	0.028	0.770	0.028	1.339	0.028	1.628	0.028	0.33	Drainage Area	1.65	10	
	Slow Release 2	Offsite	0.002	0.0001	0.042	0.001	0.101	0.001	0.182	0.001	0.224	0.001	0.05	Drainage Area	0.25	10	
Creek	Slow Release 1	Offsite	0.026	0.010	0.563	0.014	1.103	0.014	1.956	0.014	2.453	0.014	0.33	Drainage Area	1.65	10	
	Slow Release 1	Offsite	0.011	0.006	0.230	0.020	0.471	0.02	0.792	0.020	0.956	0.020	0.17	Drainage Area	0.85	10	
Locke Mountain	Slow Release 2	Offsite	0.003	0.000	0.061	0.016	0.120	0.016	0.198	0.016	0.237	0.016	0.04	Drainage Area	0.2	10	
	Level Spreader	Ditch	0.026	0.026	0.129	0.129	1.142	1.142	3.063	3.063	4.129	4.129	1.71	Flow Rate	4.129	10	Clean Water Diversion
High Street	DD-1	Offsite	0.056	0.129	1.17	2.72	2.46	5.57	4.14	9.24	4.97	11.05	2.3	Flow Rate	11.05	173	Clean Water Diversion
	DD-2	Ditch	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.8	N/A	N/A	N/A	Discharges to Bush Road Gutter

ADJOINING LAND OWNERS TABLE

Valve Site	Landowner Name	Site Address	Landowner Address	Tax Account Number	Sunoco Tract Number
Westmoreland Co.					
Bush Road Block Valve	Edward and Alice Marie Mioduski	732 Bush Rd, New Alexandria PA 15670	732 Bush Rd, New Alexandria PA 15670	52-09-00-0-0016-00-00	PA-WM2-0066.000-SS
	Robert Jr and Joann Buskey	121 Robinson Rd, Saltsburg, PA	121 Robinson Rd, Saltsburg, PA 15681	52-02145-0000	
Delmont Pump Station	Gloria & Robert Bingle		241 Violet Lane, Delmont, PA 15626	57-07-00-0-023	
	Polyhisolidar Inc		201 Industrial Drive, Delmont, PA 15626	57-08-00-0-003	
Blair Co.					
Charger Highway Block Valve	Estate Of Serena Albarano			04.00-04.-.-015.00-000	PA-BL-0001.0041-TAR
Locke Mountain Road Block Valve	Arthur Ollinger			08.00-07.-.-015.01-000	PA-BL-001.0063-TAR
	Douglas and Wendy Irvin			08.00-07.-.-026.07-000	PA-BL-0001.0062-SS
High Street Block Valve	Earl and Norma Jean Newswanger			24.00-11.-.-010.00-000	PA-BL-0129.0000-PAR
Cumberland Co.					
Creek Road Block Valve	Sunoco Pipeline LP	390 Creek Rd, Middleton TWP	390 Creek Rd, Middleton TWP	29-06-0019-006	PA-CU-0125.0000-ABTS
Dauphin Co.					
Middletown Pump Station	M&G Realty Inc.			34-001-094	
	Horn, Rebecca et al			34-001-007	
Berks Co.					
Beckersville Pump Station	Glasfor, Donald E. & Natalie V				
	Pollak, Louis H. & Katherine W.				
Cambria Co.					
Ebensburg Pump Station	Odonnell, Amy M. & Brandon T			08-009-103.001	
Huntingdon Co.					
Mount Union Pump Station	Vaughn Jr., Charlse A.			42-10-31	
Perry Co.					
Doyleburg Pump Station	Riggs, James W & Linda			251,172.00-001.000	



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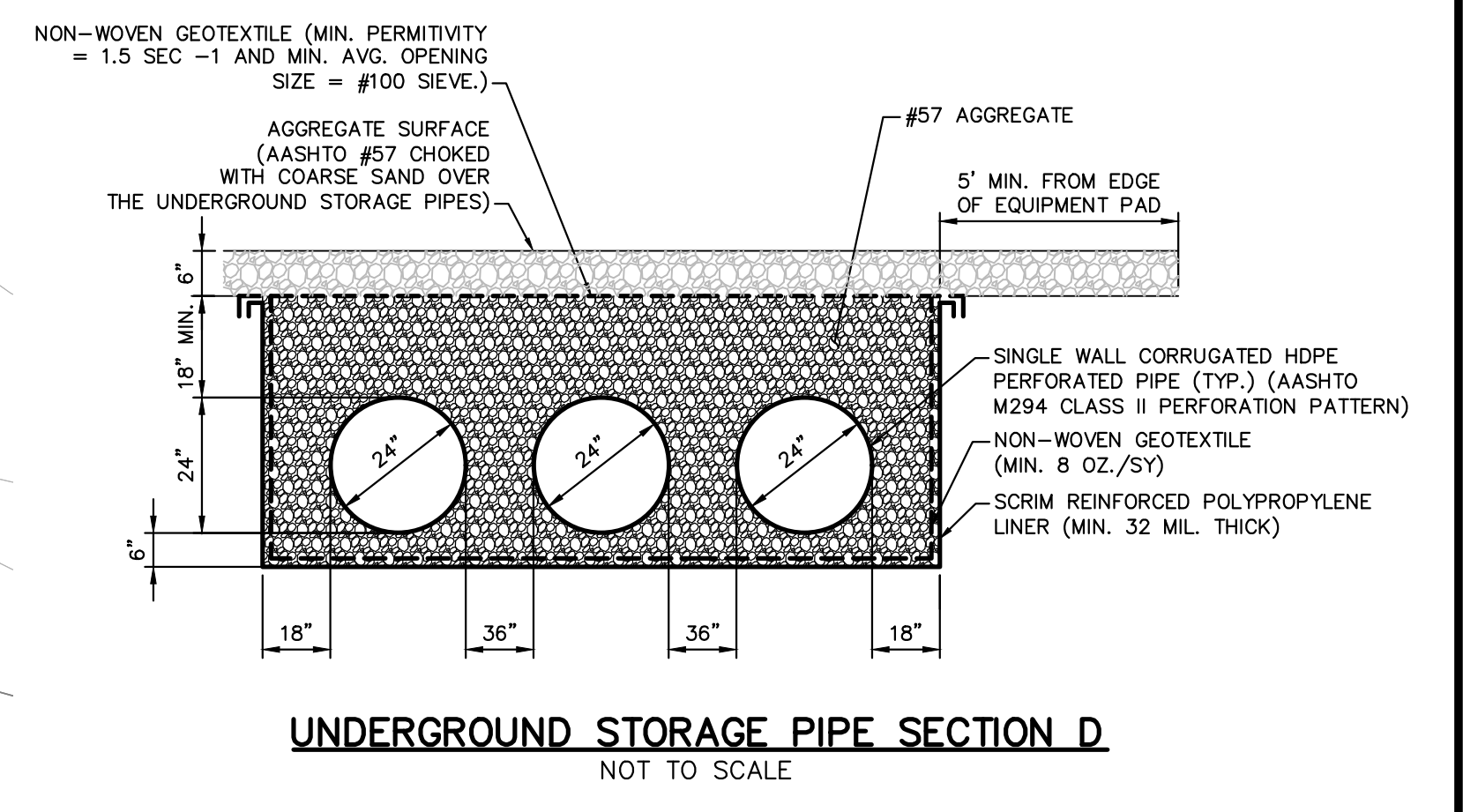
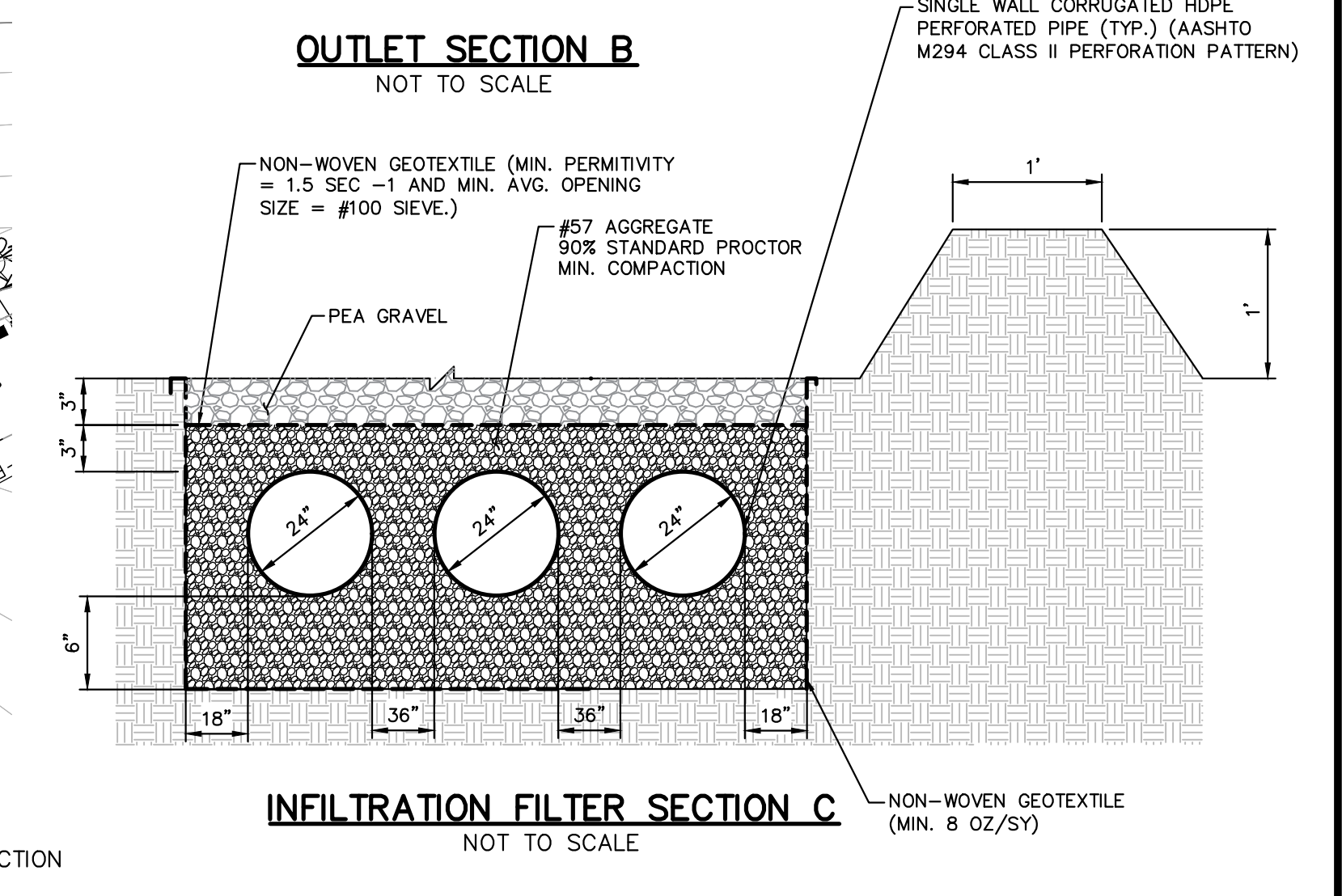
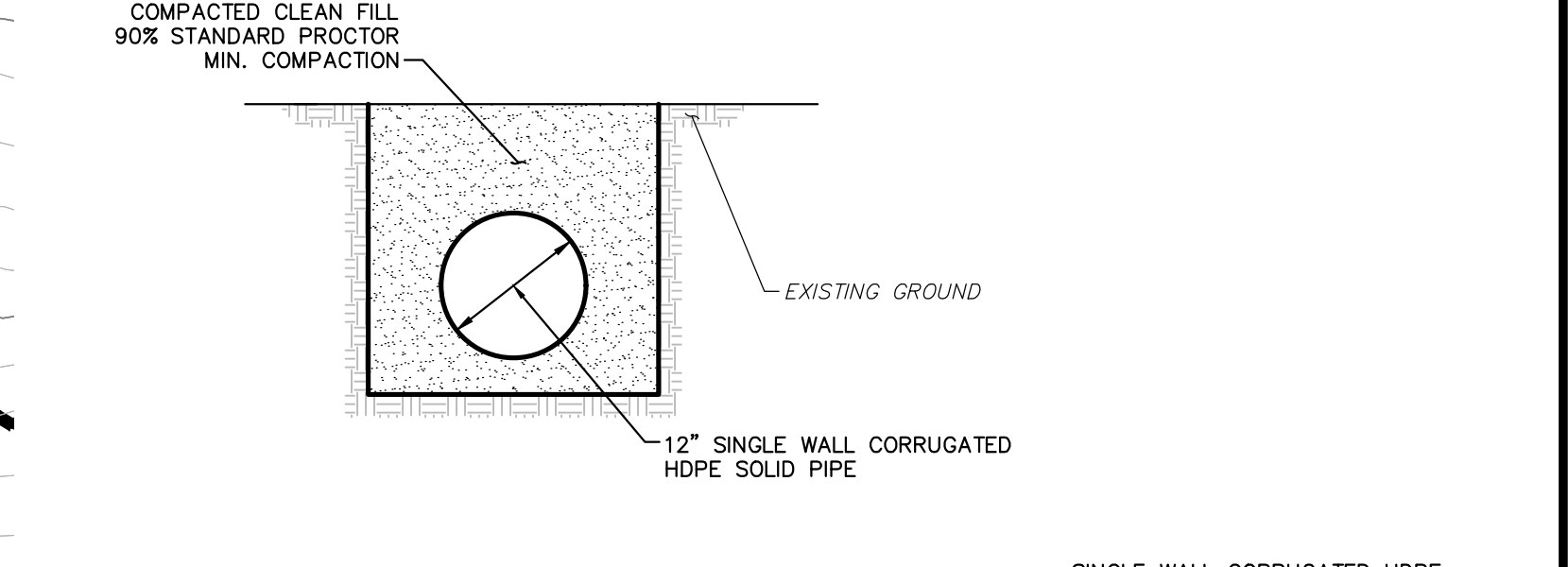
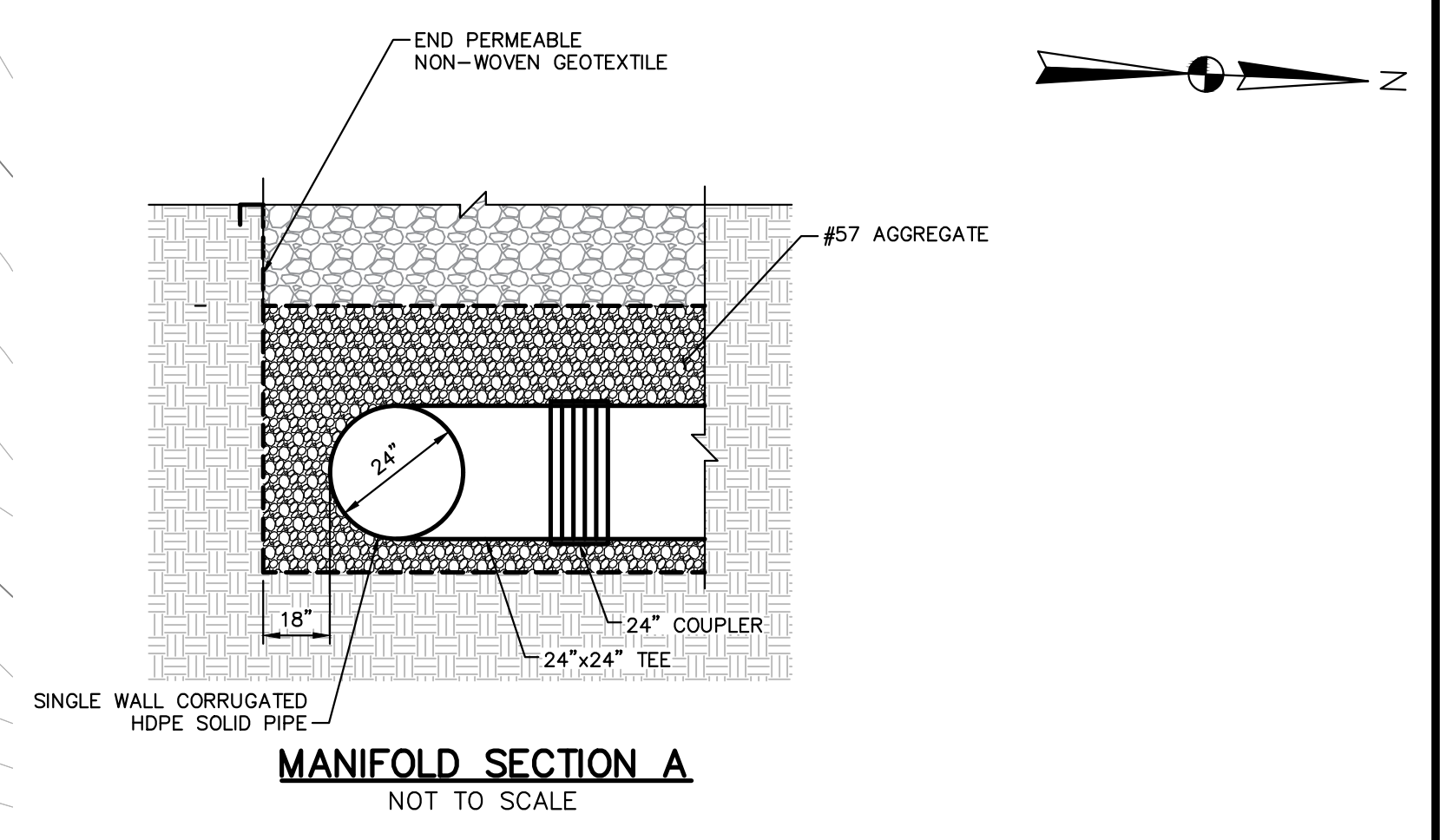
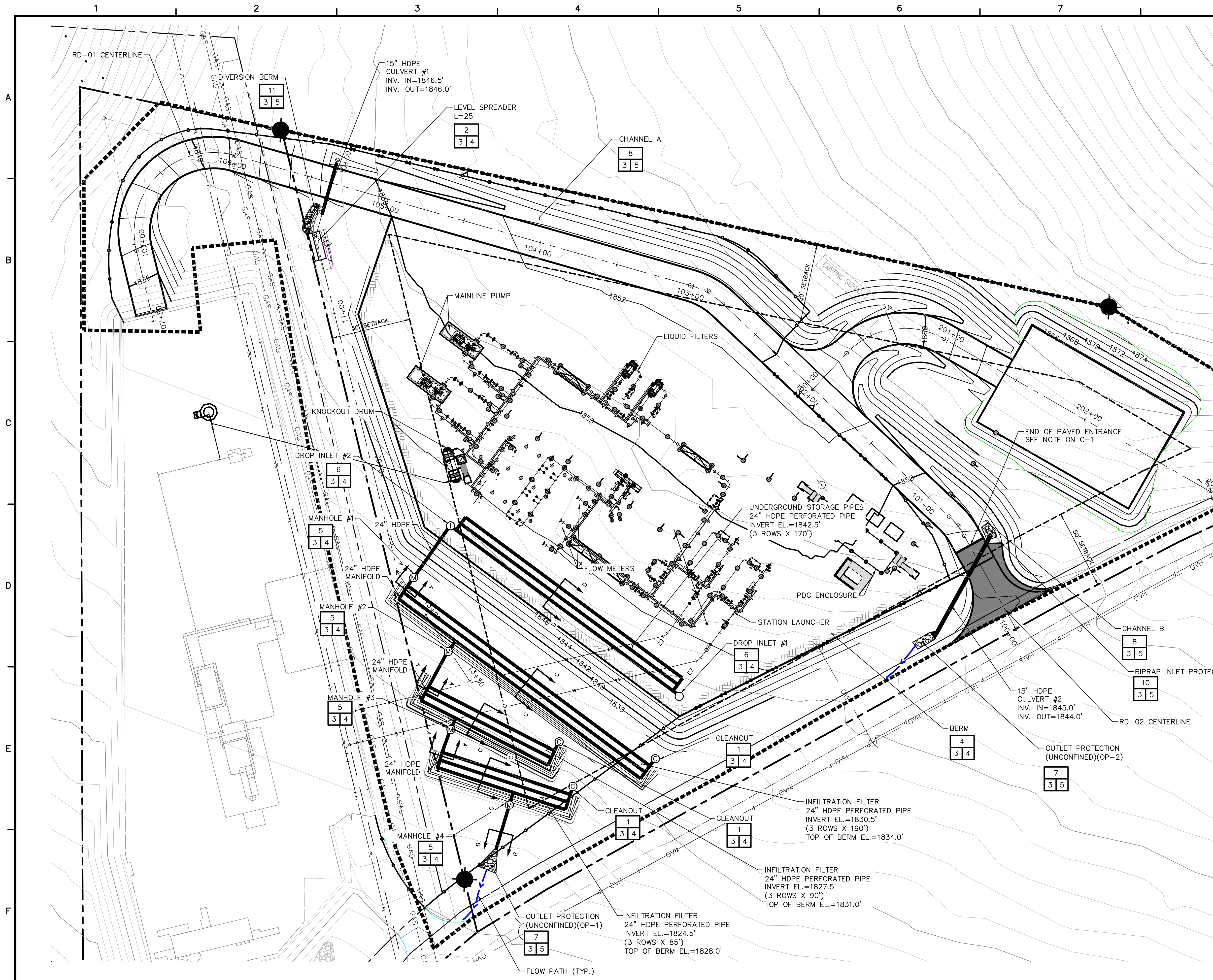
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SINKING SPRING, PENNSYLVANIA**

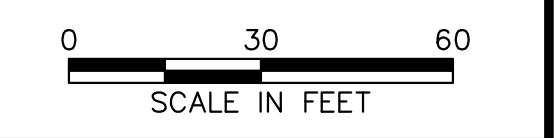
DELMONT STATION

OFF-SITE DISCHARGE

DATE:	2/5/17
PROJECT NO.:	PB-00136
DESIGNED BY:	RS
DRAWN BY:	BH
CHECKED BY:	RS
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NOTE:
 1. EXISTING WETLANDS ARE NOT PRESENT WITHIN THE LIMITS OF DISTURBANCE OF THE PROJECT.

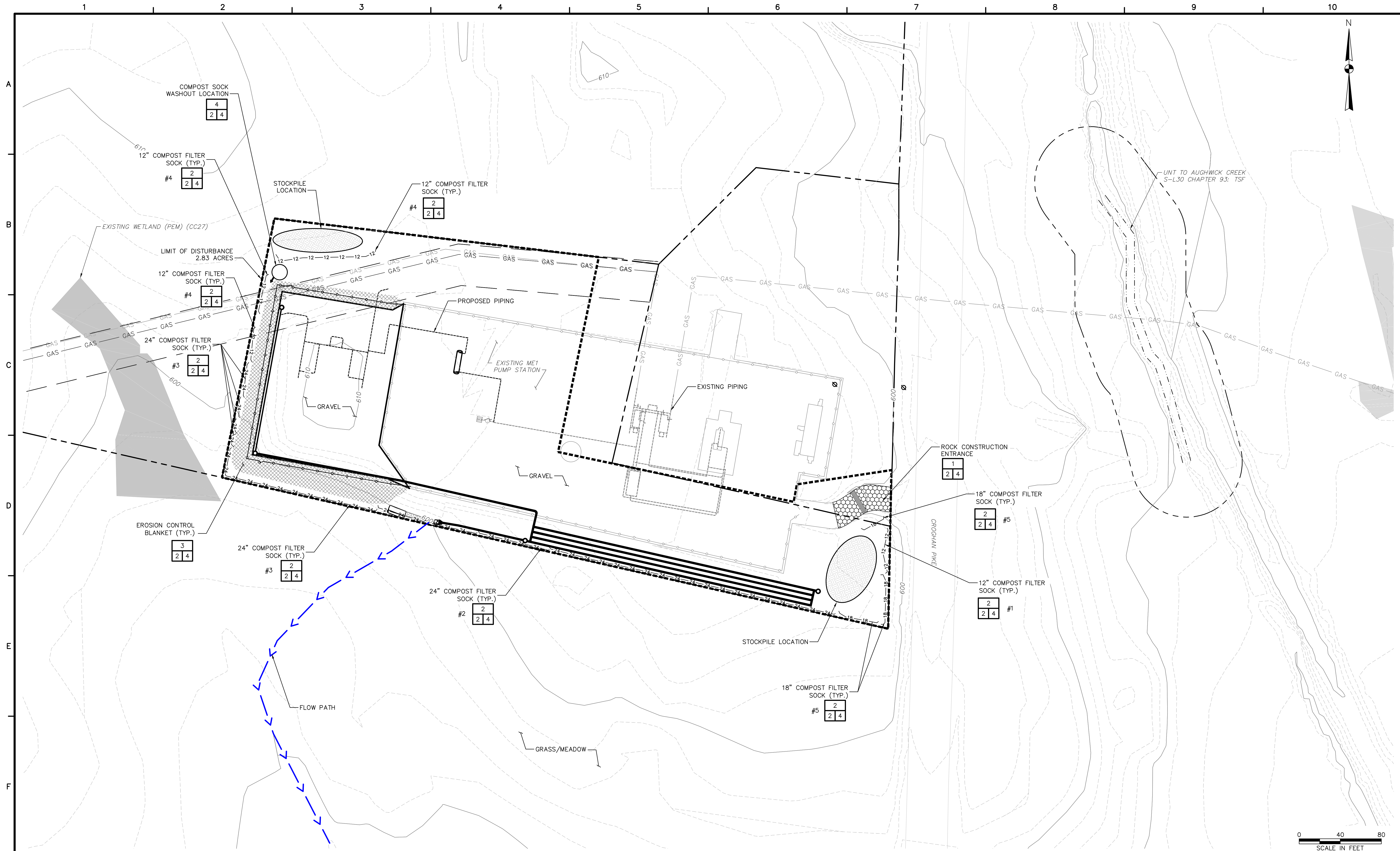


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EBENSBURG STATION

ESCGP-2 POST CONSTRUCTION STORMWATER PLAN
 DATE: 2/5/17
 PROJECT NO.: 212ICPB00136
 DESIGNED BY: TD
 DRAWN BY: BH
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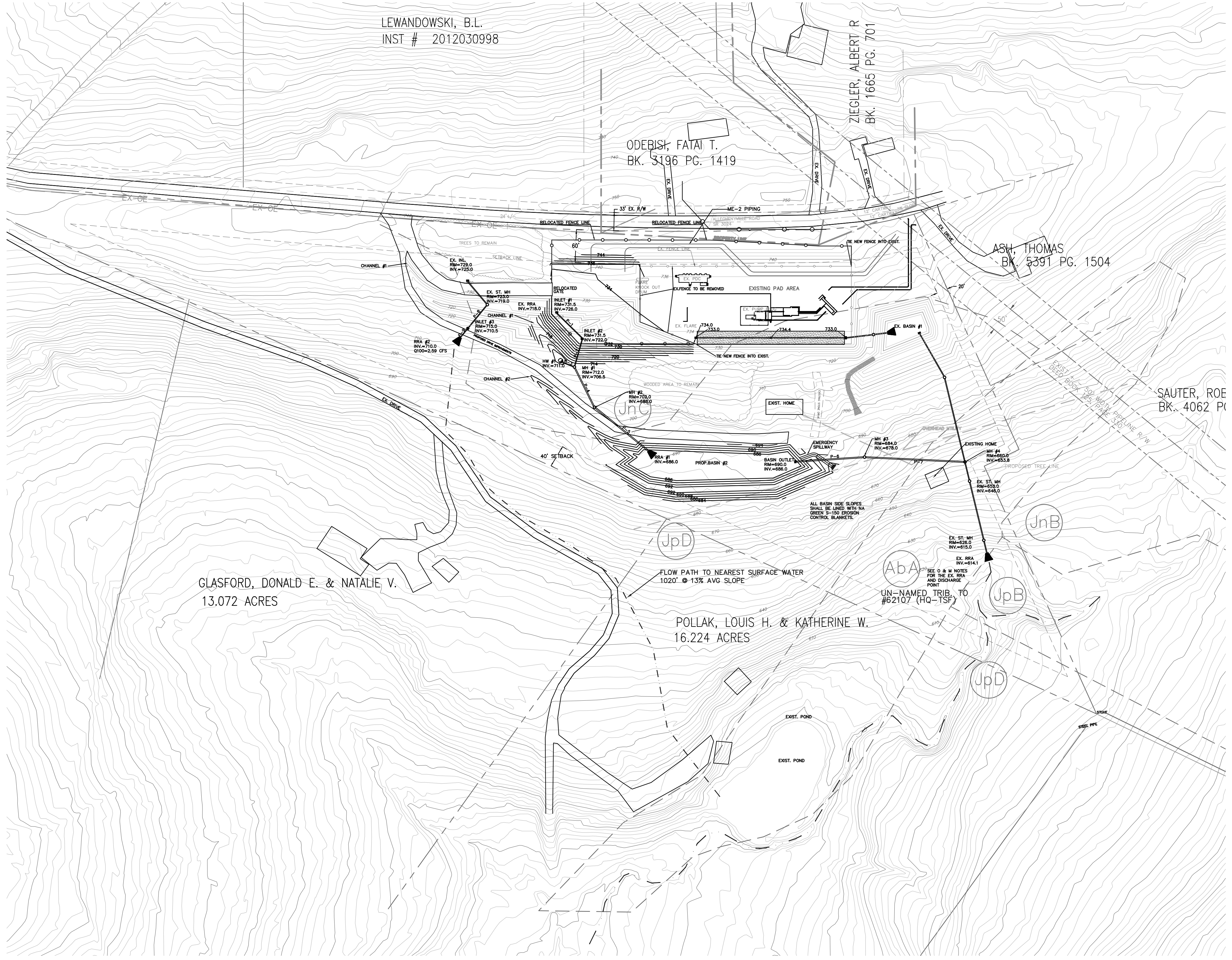
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 MT. UNION STATION

ESCGP-2 EROSION & SEDIMENT CONTROL PLAN

OFF-SITE DISCHARGE

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LEGEND

- EXISTING R/W
- - - PROPERTY LINE
- (UnD) SOIL BOUNDARY
- - - SETBACK LINE
- 730 EXISTING CONTOURS
- 735 PROPOSED CONTOURS
- Tc FLOW PATH
- - - PRE-DEV DA BOUNDARY
- - - POST-DEV DA BOUNDARY
- - - LOD/ESCGP-2 BOUNDARY = 5.985 AC
- ▣ PADOT TYPE M PRECAST INLET
- 4' DIA. PADOT PRECAST STORM MH
- STORM PIPE W/ FES
- RIPRAP APRON
- 8' HEIGHT "SIMTEK" FENCE

0 100 200
SCALE: 1"=100'

3A
OF
8

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MARK	DATE	DESCRIPTION	BY
1	4/22/16	REVISED PER EXISTING SURVEY	GZ
2	5/13/16	REVISED PER LTL LETTER (4/20/16)	GZ
3	7/01/16	REVISED PER LTL LETTER (6/7/16)	GZ
4	10/18/16	REVISED PER PA DEP REVIEW	GZ

PPP – BECKERSVILLE PUMP STATION
BRECKNOCK TOWNSHIP, BERKS COUNTY

PCSM PLAN – OFFSITE DISCHARGE FLOW PATH

DATE: 03/11/16
PROJECT NO.: 2121C-PB-00136
DRAWN BY: GZ
CHECKED BY: TC
SCALE: 1"=100'
FILE: BASEPLAN
NAME: PROP 3
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M & G REALTY, INC.
34-001-094

FLOW PATH TO
NEAREST SURFACE WATER
86' @ 3.5% AVG SLOPE
Q100=2.39 CFS

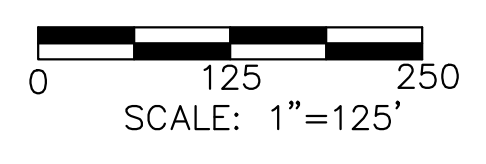
FLOW PATH TO
NEAREST SURFACE WATER
160' @ 10% AVG SLOPE
Q100=2.49 CFS

UNNAMED TRIB.
FLOW PATH TO
NEAREST SURFACE WATER
1085' @ 3.3% AVG SLOPE

HORN, REBECCA et al
TRACT
34-001-007
50.87 ACRES (R)

SWAP PARCEL = 4.54 AC

WETLAND



5A
OF
9



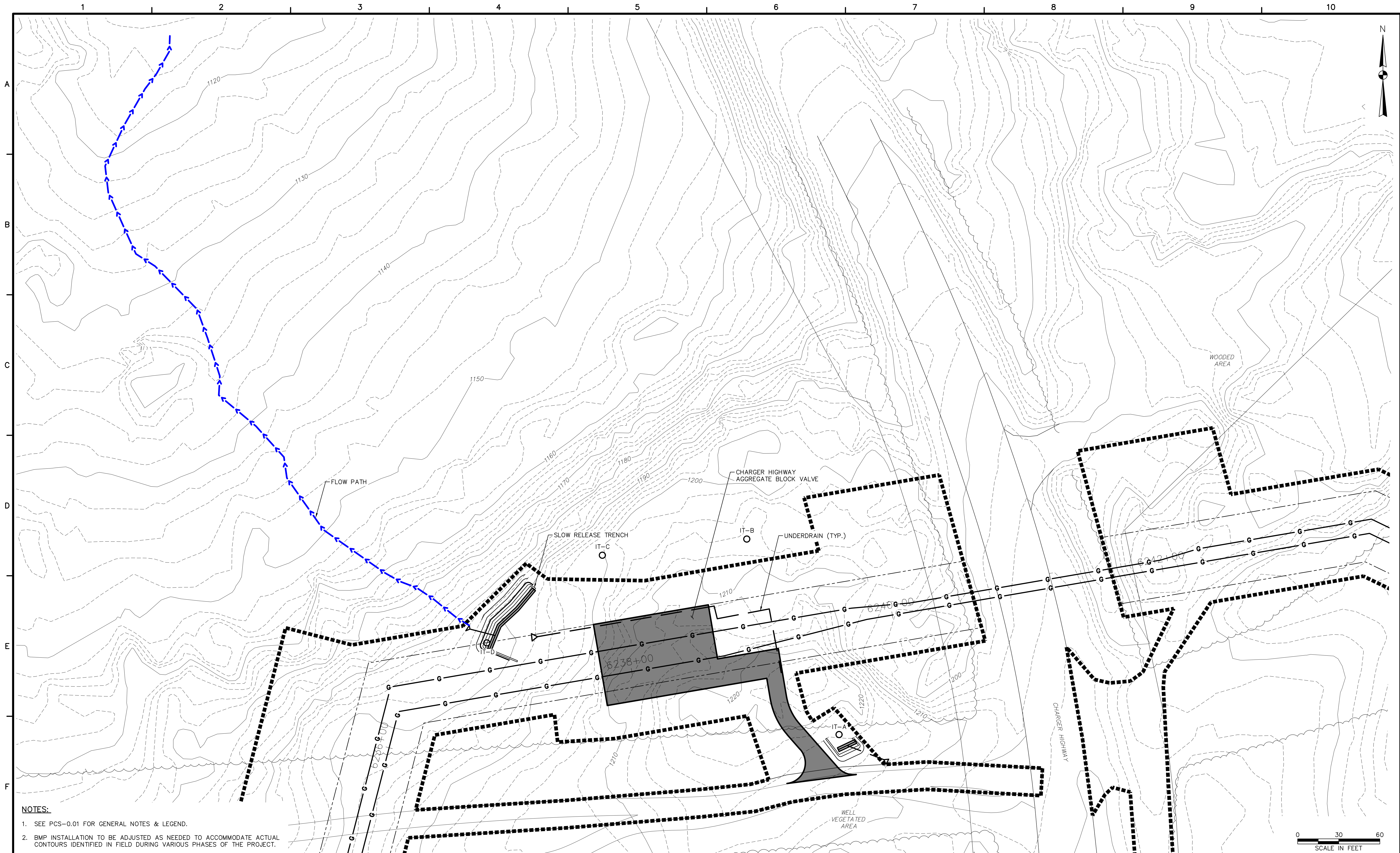
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MARK	DATE	DESCRIPTION	BY
1.	4/22/16	REVISED PER EXISTING SURVEY	GZ
2.	4/26/16	REVISED PER HRG COMMENTS (4.14.16)	GZ
3.	10/27/16	REVISED PER DEP COMMENTS (9.6.16)	GZ
4.	2/6/17	REVISED PER DEP COMMENTS	GZ

PPP – MIDDLETOWN PUMP STATION
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY

PCSM PLAN – OFF SITE DISCHARGE FLOW PATHS

DATE: 03/11/16
PROJECT NO.: 112IC05370
DRAWN BY: GZ
CHECKED BY: TC
SCALE: 1"=125'
FILE: BASEPLAN
NAME: DA5
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- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

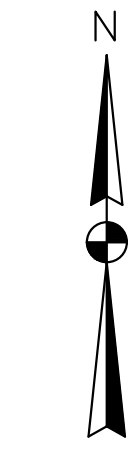
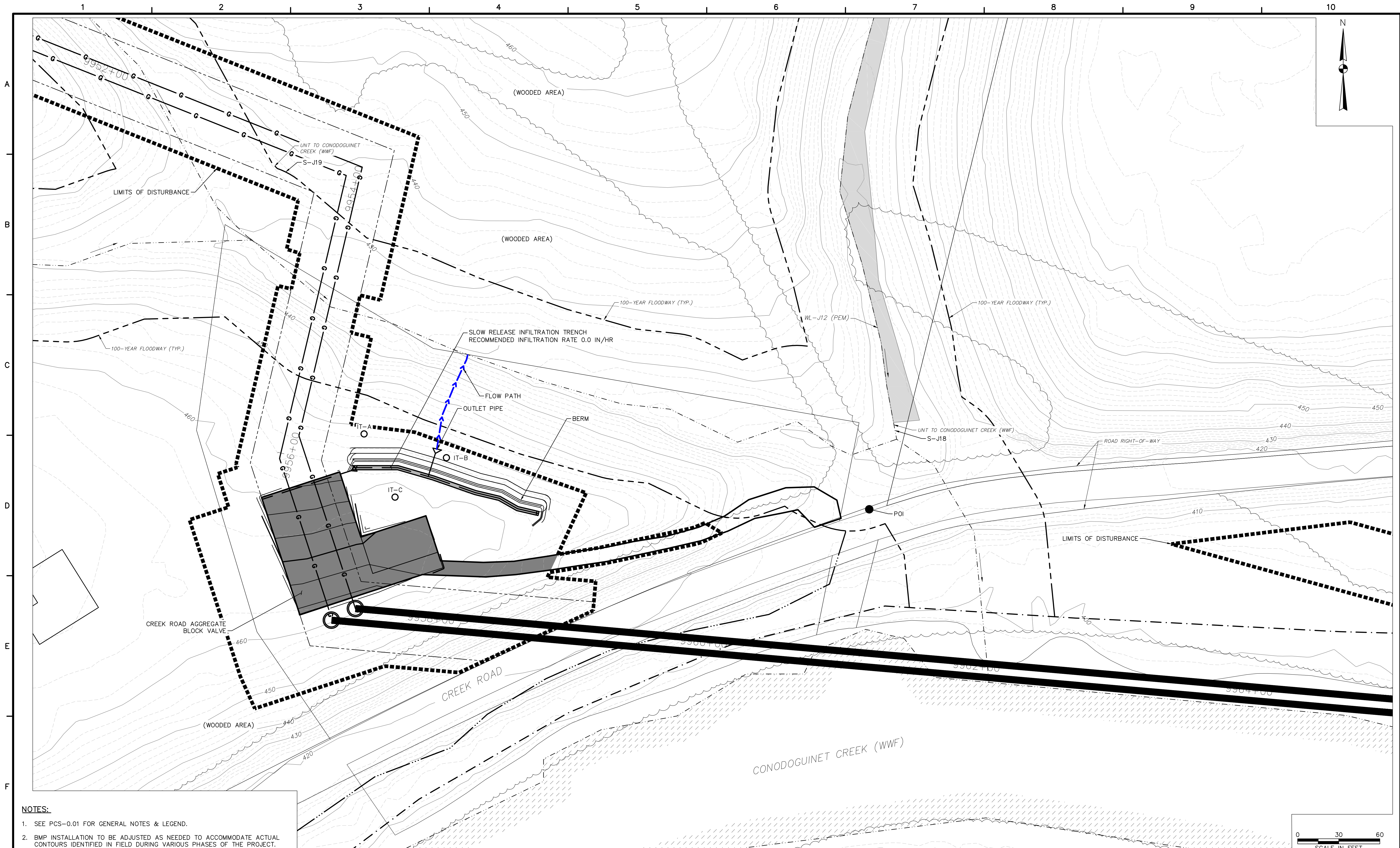
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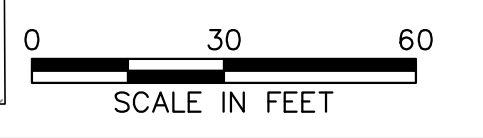
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PENNSYLVANIA PIPELINE PROJECT
OFF-SITE DISCHARGE

1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES
CHARGER HIGHWAY BLOCK VALVE

DATE:	1/26/17
PROJECT NO.:	112IC05958
DESIGNED BY:	KG
DRAWN BY:	BH
CHECKED BY:	RS
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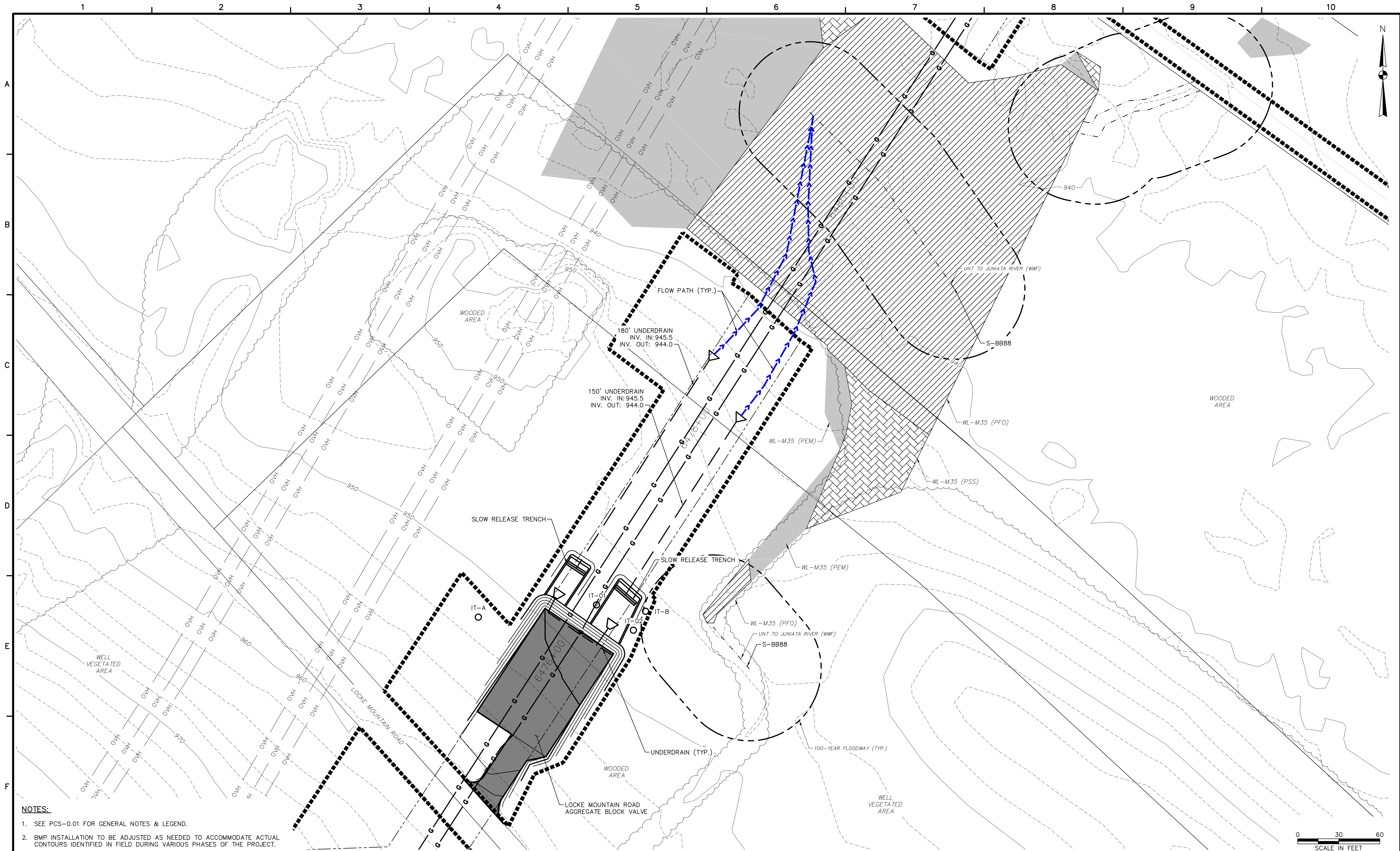
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PENNSYLVANIA PIPELINE PROJECT
 OFF-SITE DISCHARGE

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

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CREEK ROAD BLOCK VALVE



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0 30 60
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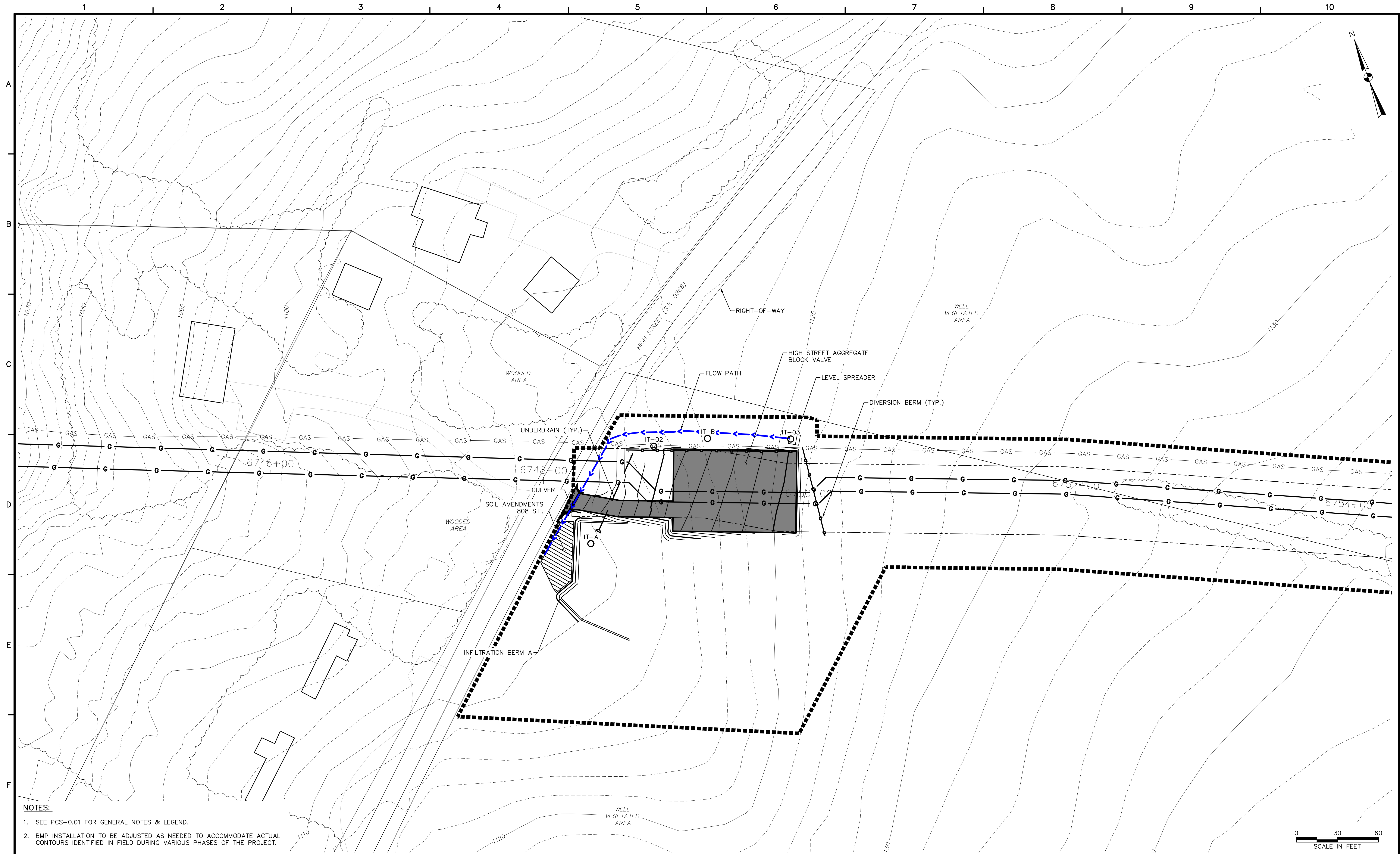
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PENNSYLVANIA PIPELINE PROJECT
OFF-SITE DISCHARGE

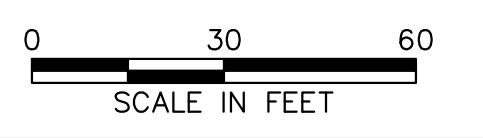
1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

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LOCKE MOUNTAIN ROAD BLOCK VALVE



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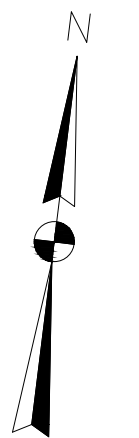
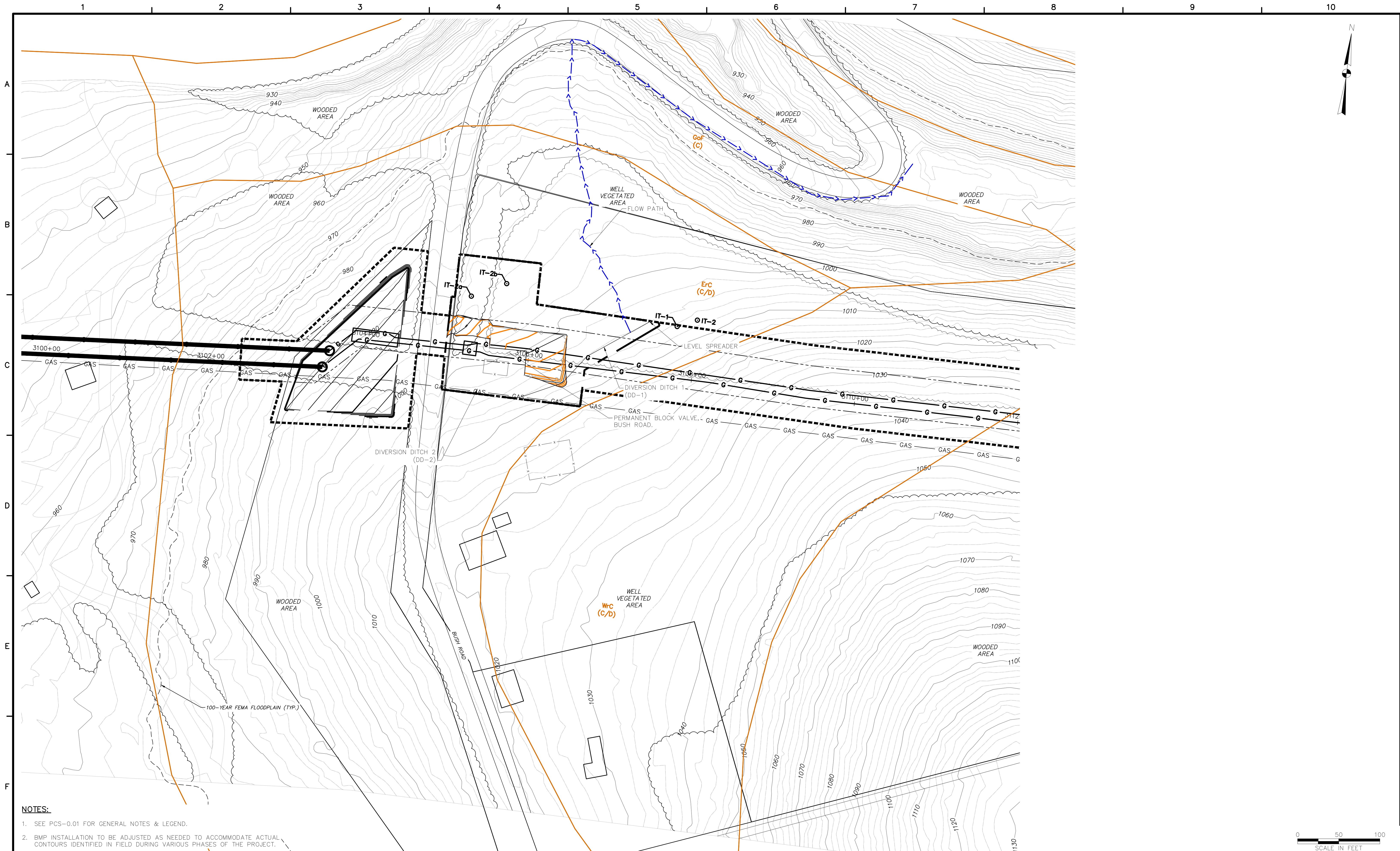
REVISIONS			
NO.	BY	DATE	REMARKS

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SINKING SPRING, PENNSYLVANIA
PENNSYLVANIA PIPELINE PROJECT
OFF-SITE DISCHARGE

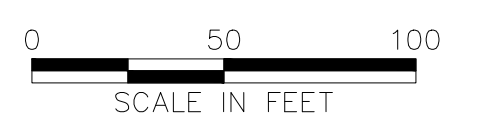
1-20" & 1-16" PROPOSED WELDED STEEL NATURAL GAS LIQUIDS PIPELINES

HIGH STREET BLOCK VALVE

DATE:	1/26/17
PROJECT NO.:	112IC05958
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OSD-3	
SHEET 3 OF 6	

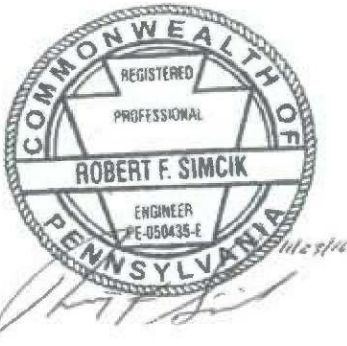


- NOTES:**
- SEE PCS-0.01 FOR GENERAL NOTES & LEGEND.
 - BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.



www.tetrotech.com
 661 ANDERSEN DRIVE - FOSTER PLAZA 7
 PITTSBURGH, PA 15220
 T: (412) 921-7090 | F: (412) 921-4040

REVISIONS			
NO.	BY	DATE	REMARKS



SUNOCO PIPELINE L.P.
 SINKING SPRING, PENNSYLVANIA
 PENNSYLVANIA PIPELINE PROJECT
 CONSTRUCTION SPREAD 2

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

BUSH ROAD BLOCK VALVE
 PCSM PLAN - OFF SITE DISCHARGE FLOW PATHS

DATE:	11/23/16
PROJECT NO.:	112IC05958
DESIGNED BY:	JB
DRAWN BY:	GR
CHECKED BY:	RS
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PCS-2.02B	
SHEET 2.02B OF 20	