



MVP SOUTHGATE PROJECT

PROPOSED H-650 PIPELINE
 ENGINEERING SERVICES DESIGN; JOB NUMBERS 300423
 ROAD - RAILROAD - WATERBODY - PERMIT DRAWINGS

DRAWING NO.	DRAWING TITLE	REV.
PERMITS-COV	MVP SOUTHGATE PROJECT H-650 PIPELINE - ROAD - RAILROAD - WATERBODY - PERMIT DRAWINGS	P2
HDD-DanRiver-001	MVP SOUTHGATE PROJECT H-650 PIPELINE - DAN RIVER - HDD	P2
HDD-StonyCreek-002	MVP SOUTHGATE PROJECT H-650 PIPELINE - STONY CREEK RESERVOIR - HDD	P2
WXP-PIVA-H650-009	MVP SOUTHGATE PROJECT H-650 PIPELINE - CASCADE CREEK - DRY CREEK - CONVENTIONAL BORE	P1
WXP-PIVA-H650-010	MVP SOUTHGATE PROJECT H-650 PIPELINE - WOLF ISLAND CREEK - CONVENTIONAL BORE	P1

**ISSUED FOR FERC
 SUPPLEMENTAL FILING**
 03/26/19

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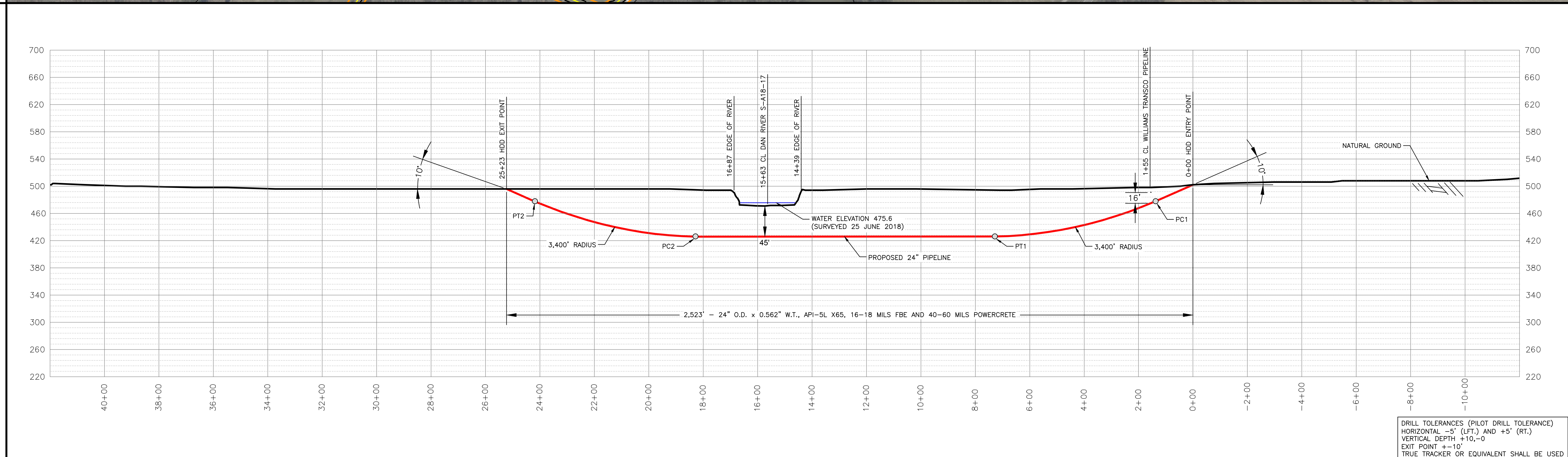
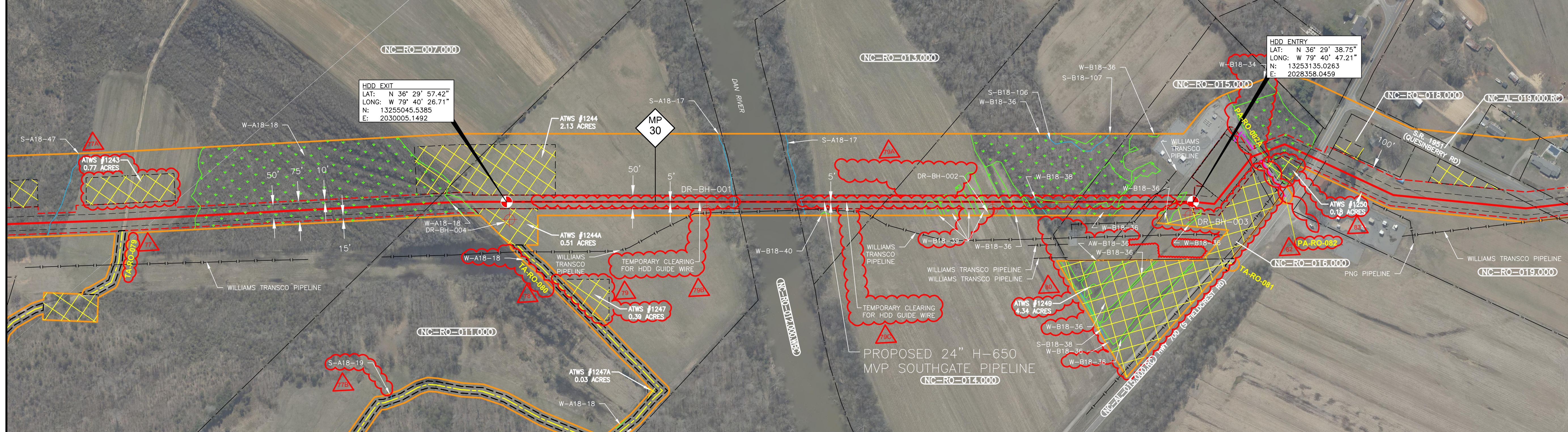
		DRAWING TITLE:					
		MOUNTAIN VALLEY PIPELINE SOUTHGATE PROJECT PROPOSED H-650 PIPELINE ROAD-RAILROAD-WATERBODY-PERMIT DRAWINGS					
PROJECT ID	300423	FACILITY	STATE	IDENTIFICATION	SERIES	SHEET	REVISION
DRAWING SCALE	NTS	MVP	VA/NC	H-650	1	1	P2

PIPE STATIONING

PLAN

PROFILE

ROCKINGHAM COUNTY, NORTH CAROLINA



LEGEND:

- HDD ENTRY / EXIT POINTS
- GEOTECH BORE HOLE LOCATIONS

- GENERAL NOTES:**
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE NECESSARY ARRANGEMENTS IF TRAFFIC CONTROL PLANS AND/OR RAILROAD REPRESENTATION ARE REQUIRED.
 - CONTRACTOR TO LOCATE, MARK AND POTHOLE FOREIGN LINES PRIOR TO EXCAVATION (AND MONITOR DURING DRILLING).
 - CONTRACTOR TO MAT OVER ANY FOREIGN PIPELINES CROSSED WITH DRILLING EQUIPMENT.
 - LOCATIONS OF EXISTING FACILITIES SHOWN ARE APPROXIMATE. CONTRACTOR TO LOCATE AND/OR CONFIRM THE LOCATIONS AND DEPTH OF ALL UTILITIES, PIPELINES OR OTHER OBSTACLES PRIOR TO EXCAVATION.
 - CONTRACTOR TO SUPPORT EXISTING UTILITIES, PIPELINES AND/OR OTHER FEATURES.
 - CONTRACTOR TO GRADE EXCAVATION AREA AND RESTORE TO ORIGINAL CONDITIONS.
 - CONTRACTOR TO CONTACT STATE ONE CALL SYSTEM AT LEAST 72 HOURS PRIOR TO DRILLING.

PHOTOGRAPHY:
2018 FLOWN IMAGERY

PROJECTION SYSTEM:
NAD83 UTM 17N (U.S. SURVEY FEET)

- INSTALLATION NOTES:**
- ACCESS: ALL EQUIPMENT MUST ACCESS THE SITE THROUGH THE CONSTRUCTION RIGHT-OF-WAY FROM PUBLIC OR APPROVED PRIVATE ROADS.
 - WORK SPACE: WORK SPACE LIMITS ARE DEPICTED. CLEARING WILL BE RESTRICTED TO THE WORK SPACES INDICATED AT THE ENTRY AND EXIT POINTS AND PULLBACK MAKE-UP AREA ALONG THE RIGHT-OF-WAY. CLEARING BETWEEN THE ENTRY AND EXIT POINTS IS LIMITED TO THE MINIMUM AMOUNT NECESSARY TO STRING LOCATION WIRES AND INSTALL PUMPS AND PIPING TO OBTAIN WATER (WHERE APPROVED).
 - WATER SOURCE: DRILL WATER AND PRE-INSTALLATION HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE.
 - HYDROSTATIC TEST: ABOVE GROUND PRE-INSTALLATION HYDROSTATIC TEST SHALL BE CONDUCTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE CONTRACTOR SHALL DISCHARGE HYDROSTATIC TEST WATER IN ACCORDANCE WITH PROJECT PERMITS.
 - SPILL-PREVENTION: ALL PUMPS SHALL BE SET IN SECONDARY CONTAINMENT AND IN ACCORDANCE WITH THE SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN (SPCC). EQUIPMENT AND PUMPS OPERATING WITHIN 100 FEET OF ANY WATER BODY OR WETLAND SHALL BE OPERATED AND REFUELED IN ACCORDANCE WITH THE SPCC PLAN. EQUIPMENT REFUELING AND STORAGE OF HAZARDOUS MATERIALS, FUELS, ETC. SHALL BE CONDUCTED AT LEAST 100 FEET FROM WATER BODIES AND WETLAND. EACH CONSTRUCTION CREW SHALL HAVE ON HAND SUFFICIENT TOOLS AND MATERIALS TO STOP LEAKS AND SUPPLIES OF ABSORBENT AND BARRIER MATERIALS TO ALLOW RAPID CONTAINMENT AND RECOVERY OF SPILLED MATERIALS.
 - EROSION AND SEDIMENT CONTROL: CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH CONTRACT DOCUMENTS. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL STRUCTURES AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
 - TOPSOIL SHALL BE STRIPPED AS REQUIRED BY PROJECT DOCUMENTS.
 - INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN, AND THE DRILL RIG SHALL PULL THE PIPE STRING INTO THE BORE HOLE FROM THE ENTRY POINT. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULLBACK.
 - MUD DISPOSAL: CONTRACTOR SHALL DISPOSE OF EXCESS DRILLING MUD AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS. UNDER NO CIRCUMSTANCES SHALL DRILLING FLUID BE DISPOSED OF IN WATER BODIES OR WETLANDS. ANY DRILLING MUD WHICH INADVERTENTLY EXISTS AT POINTS OTHER THAN THE ENTRY AND EXIT POINTS SHALL BE CONTAINED AND COLLECTED TO THE EXTENT PRACTICAL AND DISPOSED OF AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS.
 - CLEANUP/STABILIZATION/RESTORATION: ALL DISTURBED AREAS SHALL BE RETURNED TO THE ORIGINAL CONTOURS. DISTURBED AREAS SHALL BE SEED AS SPECIFIED IN PROJECT DOCUMENTS.

ISSUED FOR FERC SUPPLEMENTAL FILING
03/26/19

HORIZONTAL DIRECTIONAL DRILL DATA	
DESCRIPTION	STA. ELEV.
ENTRY ANGLE @ 10°	0+00 502.0'
POINT OF CURVATURE (3,400 FT. RADIUS) (PC1)	1+38 478.7'
POINT OF TANGENCY (PT1)	7+28 427.0'
POINT OF CURVATURE (3,400 FT. RADIUS) (PC2)	18+28 427.0'
POINT OF TANGENCY (PT2)	24+19 478.7'
EXIT ANGLE @ 10°	25+23 496.0'

HORIZONTAL DIRECTIONAL DRILL PARAMETERS	
1.) MAX. OPER. PRESS.:	1440 PSIG
2.) PIPE: 24.00" O.D. x 0.562" W.T. GRADE:	API-5L X65
DESIGN FACTOR:	0.50
3.) PIPE COATING:	16-18 MILS FBE
EXTERNAL COATING:	40-60 MILS POWERCRETE
LENGTH OF CROSSING:	2,523' HORIZONTAL DISTANCE
4.) TYPE OF PIPE JOINT:	WELDED X 60' LG.
LENGTH OF PIPE:	2,532' LF.

REFERENCE DRAWINGS	
DWG. NO.	DRAWING TITLE
PA-RONC-H-650-05	ALIGNMENT SHEET
H-650-12-CONST	HORIZONTAL DIRECTIONAL DRILL (HDD)

NO.	DATE	REVISION	BY	APPD.
P1	10/22/18	ISSUED FOR CLIENT REVIEW	SJS	SJO
P1	11/02/18	ISSUED FOR FERC	SJS	SJO
P2	03/26/19	ISSUED FOR FERC SUPPLEMENTAL FILING	SJS	SJO

DRILL TOLERANCES (PILOT DRILL TOLERANCE)
HORIZONTAL -5' (LFT.) AND +5' (RT.)
VERTICAL DEPTH +10,-0
EXIT POINT +10'
TRUE TRACKER OR EQUIVALENT SHALL BE USED TO TRACK PILOT HOLE

SCALE: 1"=200'
SCALE: 1"=80'

DRAWN BY:	TRC	DATE:	10/04/18
CHECKED BY:	SJO	DATE:	10/19/18
APPROVED BY:		EPO APPROVAL:	

TRC
Results you can rely on

MOUNTAIN VALLEY PIPELINE LLC

MVP SOUTHGATE PROJECT
H-650 PIPELINE
DAN RIVER HDD

SCALE:	PROJ. NO.	DRAWING NO.:	REV.
1" = 200'		HDD-DanRiver-001	P2

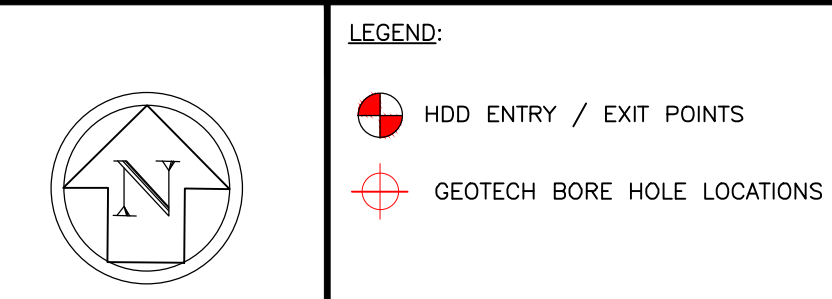
March 26, 2019 - 3:53pm

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PIPE STATIONING

PLAN

PROFILE

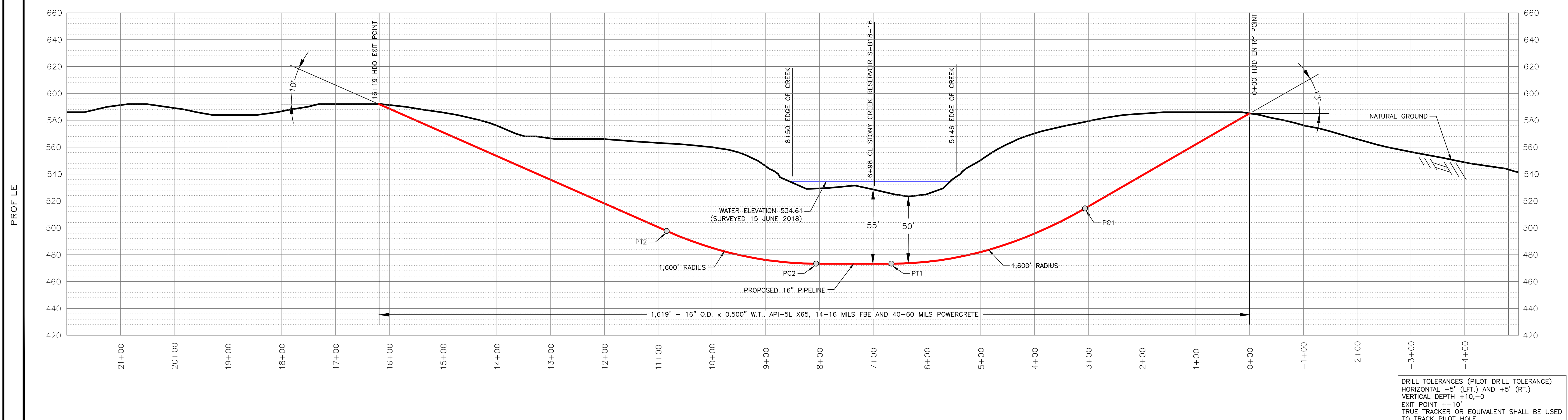
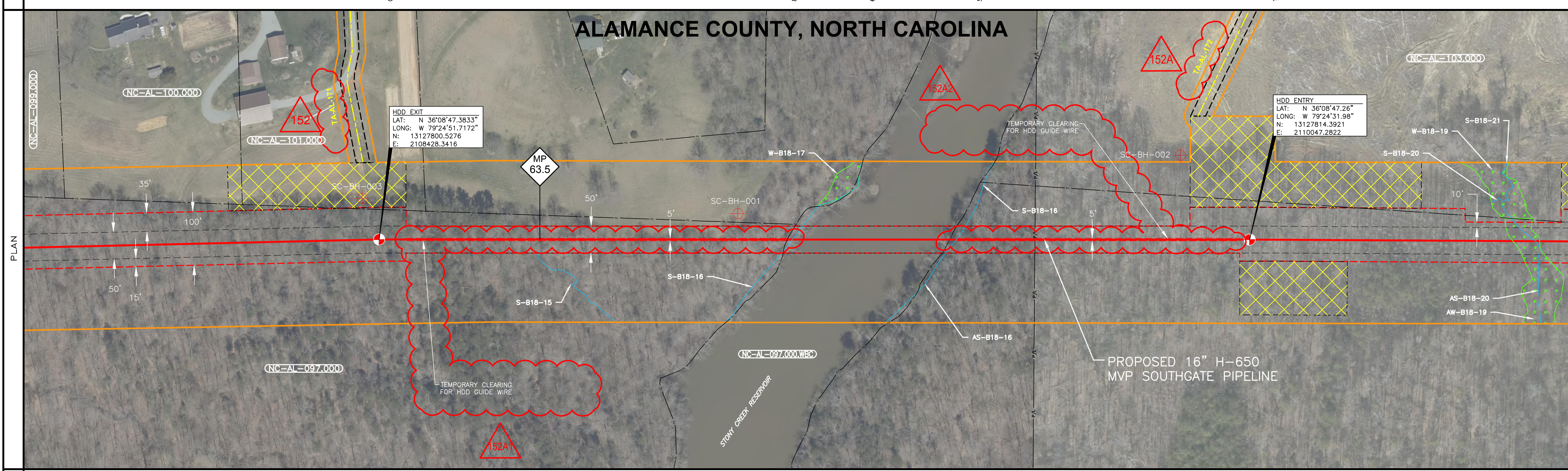


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PHOTOGRAPHY:
2018 FLOWN IMAGERY

PROJECTION SYSTEM:
NAD83 UTM 17N (U.S. SURVEY FEET)

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ISSUED FOR FERC SUPPLEMENTAL FILING
03/26/19

HORIZONTAL DIRECTIONAL DRILL DATA			HORIZONTAL DIRECTIONAL DRILL PARAMETERS		
DESCRIPTION	STA.	ELEV.			
ENTRY ANGLE @ 13°	0+00	585.1'	1.) MAX. OPER. PRESS.:	1440 PSIG	
POINT OF CURVATURE (PC1) (1,800 FT. RADIUS)	3+06	514.4'	2.) PIPE: 16.00" O.D. x 0.500" W.T. GRADE:	API-5L X65	
POINT OF TANGENCY (PT1)	6+66	473.4'	DESIGN FACTOR:	0.50	
POINT OF CURVATURE (PC2) (1,800 FT. RADIUS)	8+06	473.4'	3.) PIPE COATING:	14-16 MILS. FBE	
POINT OF TANGENCY (PT2)	10+84	497.7'	EXTERNAL COATING:	40-60 MILS. POWERCRETE	
EXIT ANGLE @ 10°	16+19	592.0'	LENGTH OF CROSSING:	1,619' HORIZONTAL DISTANCE	
			4.) TYPE OF PIPE JOINT:	WELDED X 60" LG.	
			LENGTH OF PIPE:	1,640 L.F.	

REFERENCE DRAWINGS		NO.		DATE		REVISION		BY		APPD.	
DWG. NO.	DRAWING TITLE										
PA-ALNC-H-650-12	ALIGNMENT SHEET	P1	10/22/18	ISSUED FOR CLIENT REVIEW	SJS	SJO					
H-650-12-CONST	HORIZONTAL DIRECTIONAL DRILL (HDD)	P1	11/02/18	ISSUED FOR FERC	SJS	SJO					
		P2	03/26/19	ISSUED FOR FERC SUPPLEMENTAL FILING	SJS	SJO					

DRILL TOLERANCES (PILOT DRILL TOLERANCE)
 HORIZONTAL -5' (L.F.) AND +5' (R.T.)
 VERTICAL DEPTH +10,-0
 EXIT POINT ±10'
 TRUE TRACKER OR EQUIVALENT SHALL BE USED TO TRACK PILOT HOLE

0 50 100
PLAN SCALE: 1"=100'

0 50 100
PROFILE (H) SCALE: 1"=100'

0 20 40
PROFILE (V) SCALE: 1"=40'

Mountain Valley PIPELINE LLC

DRAWN BY: TRC DATE: 10/09/18
 CHECKED BY: SJO DATE: 10/23/18
 APPROVED BY: EPO APPROVAL:

TRC
Results you can rely on

MVP SOUTHGATE PROJECT
H-650 PIPELINE
STONY CREEK RESERVOIR HDD

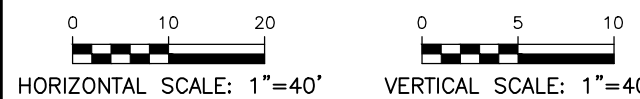
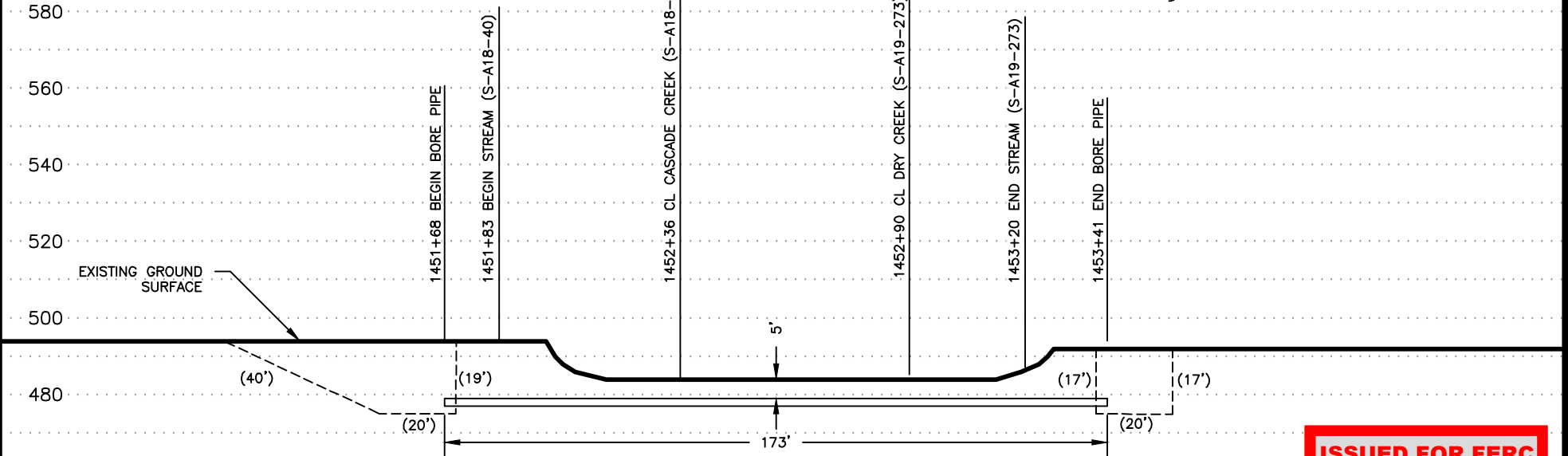
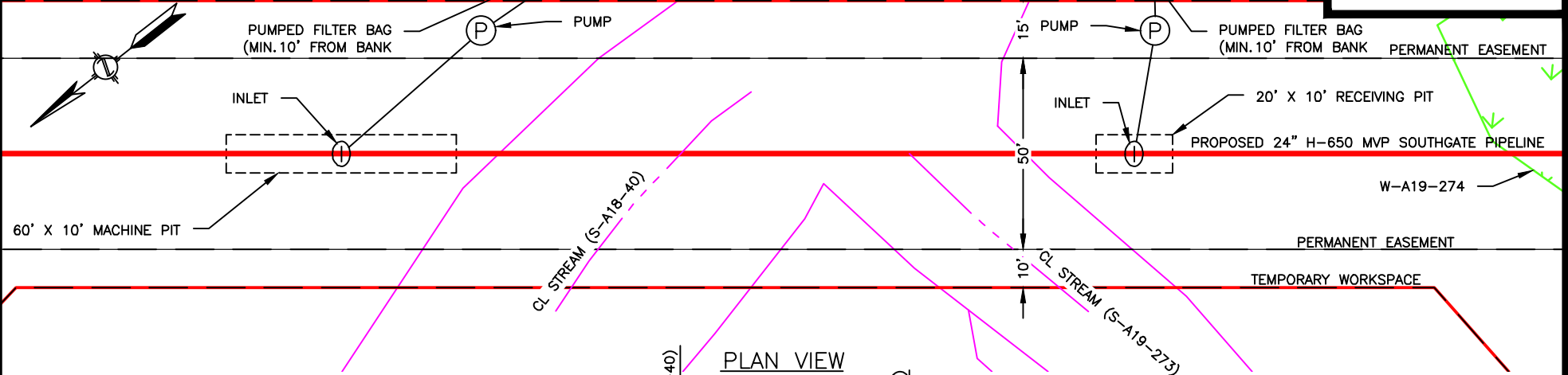
SCALE: 1" = 100' PROJ. NO. DRAWING NO. REV.
 HDD-StonyCreek-002 P2

March 26, 2019 - 8:43am

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TEMPORARY WORKSPACE

C/L MP 27.5



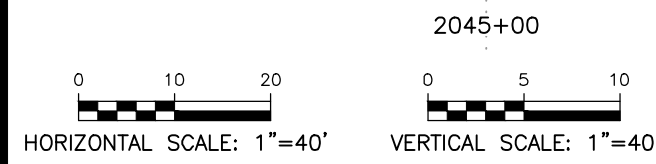
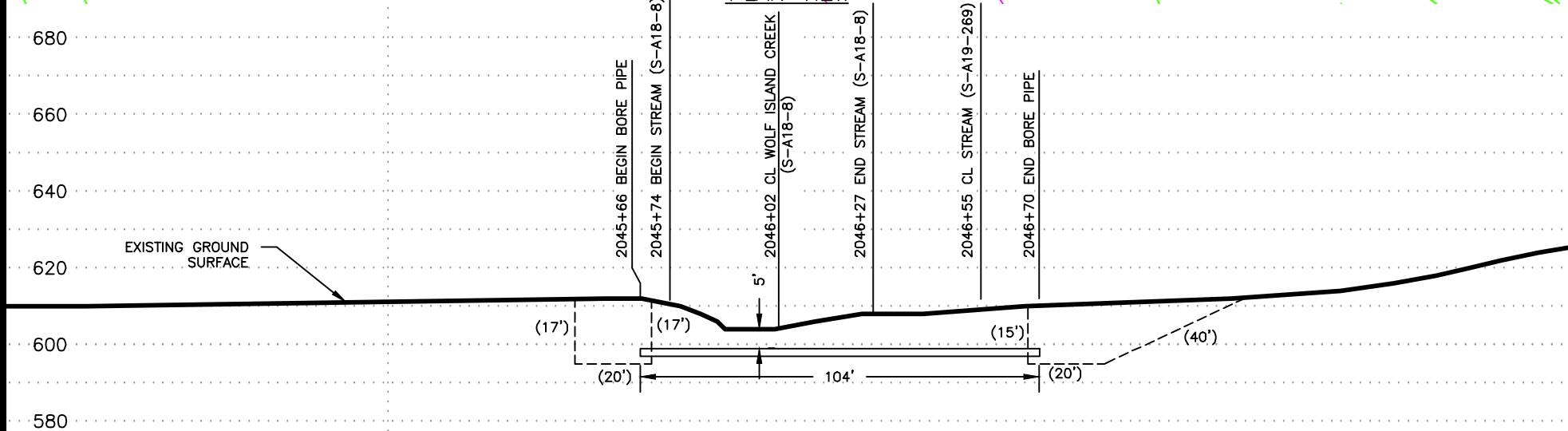
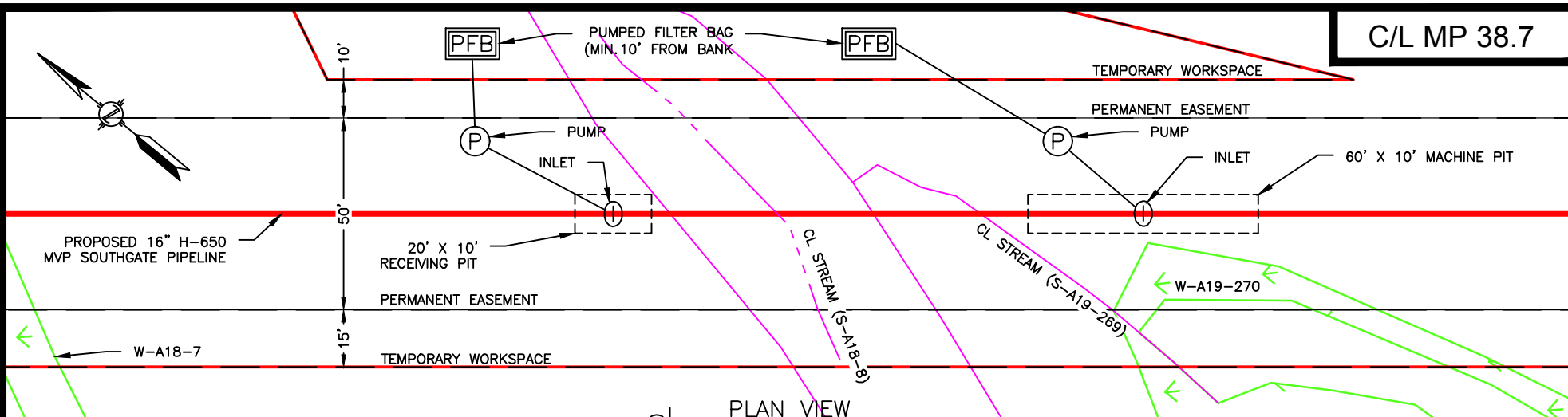
**ISSUED FOR FERC
SUPPLEMENTAL
FILING
03/26/19**

- NOTES:**
1. MINIMUM 5' OF COVER BETWEEN STREAMBED AND TOP OF PIPELINE.
 2. PROPOSED BACKFILL WILL BE IN TRENCH AND WILL BE RESTORED TO PRE-CONSTRUCTION ELEVATIONS.
 3. WATER DEPTH SHOWN ON PROFILE IS NOT TO SCALE.
 4. E&SC BMPS HAVE BEEN REMOVED FOR CLARITY AND ARE DISPLAYED ON PLAN VIEW.

PREPARED BY:

CASCADE CREEK - DRY CREEK
CONVENTIONAL BORE CROSSING DETAIL
MVP SOUTHGATE PROJECT
PROPOSED H-650 PIPELINE
PITTSYLVANIA COUNTY, VIRGINIA


DRAWN BY: AWF	02/20/19
DRAFTING CK:	
ENVIRONMENTAL CK:	
ENGINEERING CK:	
DETAIL SHEET:	
DRAWING NO.:	
WXP-PIVA-H650-009	
SCALE: 1" = 40'	REV. P1
DATE OF PLOT: 3/15/2019	



**ISSUED FOR FERC
SUPPLEMENTAL
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03/26/19**

- NOTES:**
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PREPARED BY:

WOLF ISLAND CREEK
CONVENTIONAL BORE CROSSING DETAIL
MVP SOUTHGATE PROJECT
PROPOSED H-650 PIPELINE
ROCKINGHAM COUNTY, NORTH CAROLINA

DRAWN BY: AWF	02/20/19
DRAFTING CK:	
ENVIRONMENTAL CK:	
ENGINEERING CK:	
DETAIL SHEET:	
DRAWING NO.:	
WXP-PIVA-H650-010	
SCALE: 1" = 40'	REV. P1
DATE OF PLOT: 3/17/2019	