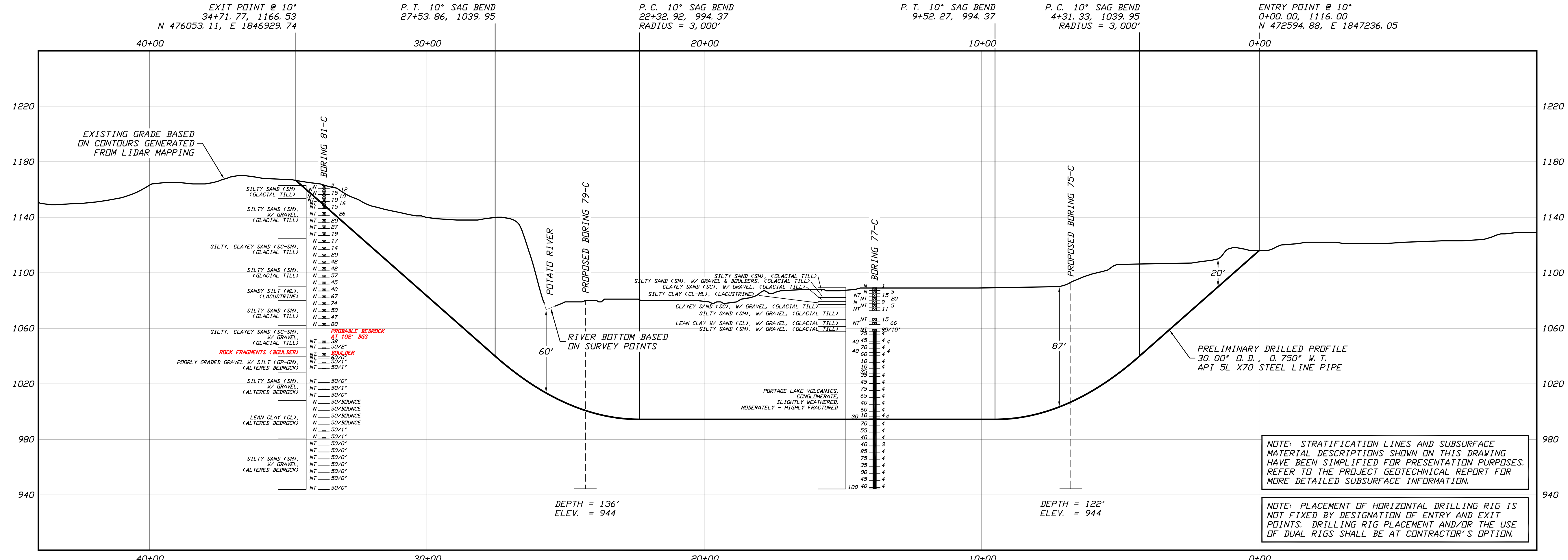
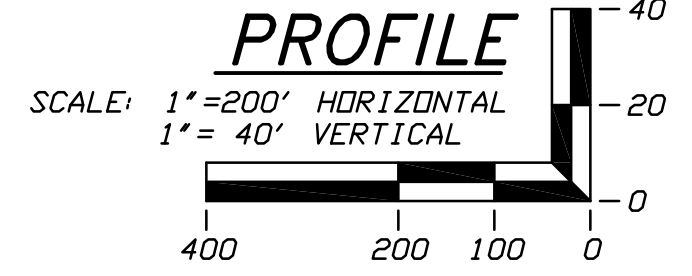


PLAN
SCALE: 1"=200'



NOTE: STRATIFICATION LINES AND SUBSURFACE MATERIAL DESCRIPTIONS SHOWN ON THIS DRAWING HAVE BEEN SIMPLIFIED FOR PRESENTATION PURPOSES. REFER TO THE PROJECT GEOTECHNICAL REPORT FOR MORE DETAILED SUBSURFACE INFORMATION.

NOTE: PLACEMENT OF HORIZONTAL DRILLING RIG IS NOT FIXED BY DESIGNATION OF ENTRY AND EXIT POINTS. DRILLING RIG PLACEMENT AND/OR THE USE OF DUAL RIGS SHALL BE AT CONTRACTOR'S OPTION.



- GENERAL LEGEND**
- DRILLED PATH ENTRY/EXIT POINT
- GEOTECHNICAL LEGEND**
- ⊙ BORING LOCATION
- SPLIT SPOON SAMPLE**
- 53.1.23 PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
 - PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL
- CORE BARREL SAMPLE**
- UCS 6, 250 UNCONFINED COMPRESSIVE STRENGTH (PSI)
 - 53.1.6 MOHS HARDNESS
 - ROCK QUALITY DESIGNATION (PERCENT)

- GEOTECHNICAL NOTES**
- GEOTECHNICAL DATA PROVIDED BY BRAUN INTERTEC, DULUTH, MINNESOTA. REFER TO THE PRELIMINARY BORING LOGS DATED APRIL & MAY 2020 FOR MORE DETAILED SUBSURFACE INFORMATION.
 - THE LETTER 'N' TO THE LEFT OF A SAMPLE INDICATES THAT NO GRAVEL WAS OBSERVED IN THE SAMPLE. THE LETTERS 'NT' INDICATE THAT GRAVEL WAS OBSERVED BUT NO GRADATION TEST WAS PERFORMED.
 - THE GEOTECHNICAL DATA IS ONLY DESCRIPTIVE OF THE LOCATIONS ACTUALLY SAMPLED. EXTENSION OF THIS DATA OUTSIDE OF THE ORIGINAL BORINGS MAY BE DONE TO CHARACTERIZE THE SOIL CONDITIONS, HOWEVER, COMPANY DOES NOT GUARANTEE THESE CHARACTERIZATIONS TO BE ACCURATE. CONTRACTOR MUST USE HIS OWN EXPERIENCE AND JUDGMENT IN INTERPRETING THIS DATA.

- TOPOGRAPHIC SURVEY NOTES**
- TOPOGRAPHIC SURVEY DATA PROVIDED BY ENBRIDGE, DULUTH, MINNESOTA.
 - NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO WISCONSIN STATE PLANE COORDINATES, NORTH ZONE, NAD 83.
 - ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.
- DRILLED PATH NOTES**
- DRILLED PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENT.
 - DRILLED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

- PILOT HOLE TOLERANCES**
- THE PILOT HOLE SHALL BE DRILLED TO THE TOLERANCES LISTED BELOW. HOWEVER, IN ALL CASES, RIGHT-OF-WAY RESTRICTIONS AND CONCERN FOR ADJACENT FACILITIES SHALL TAKE PRECEDENCE OVER THESE TOLERANCES.
- ENTRY POINT: AS STAKED BY COMPANY
 - EXIT POINT: UP TO 10 FEET SHORT OR 20 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
 - ELEVATION: UP TO 2 FEET ABOVE AND 10 FEET BELOW THE DESIGNED PROFILE
 - ALIGNMENT: UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
 - CURVE RADIUS: NO LESS THAN 2,000 FEET BASED ON A 3-JOINT AVERAGE (ASSUMING RANGE 2 DRILL PIPE)

- PROTECTION OF EXISTING FACILITIES**
- CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS.
- CONTACT THE UTILITY LOCATION/NOTIFICATION SERVICE FOR THE CONSTRUCTION AREA.
 - POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
 - MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

PRELIMINARY - NOT FOR CONSTRUCTION

LINE 5 PIPELINE PROJECT

MP 38 - PLAN AND PROFILE
30-INCH PIPELINE CROSSING OF THE POTATO RIVER
BY HORIZONTAL DIRECTIONAL DRILLING

LOCATION: IRON COUNTY, WISCONSIN

DATE	CHECKED	APPROVED	SCALE	DRAWING LABEL	REVISION
01/14/20	DMP	JSP	SHOWN FOR D-SIZED PLOT	POTATO RIVER	P1

DRAWN: KWW

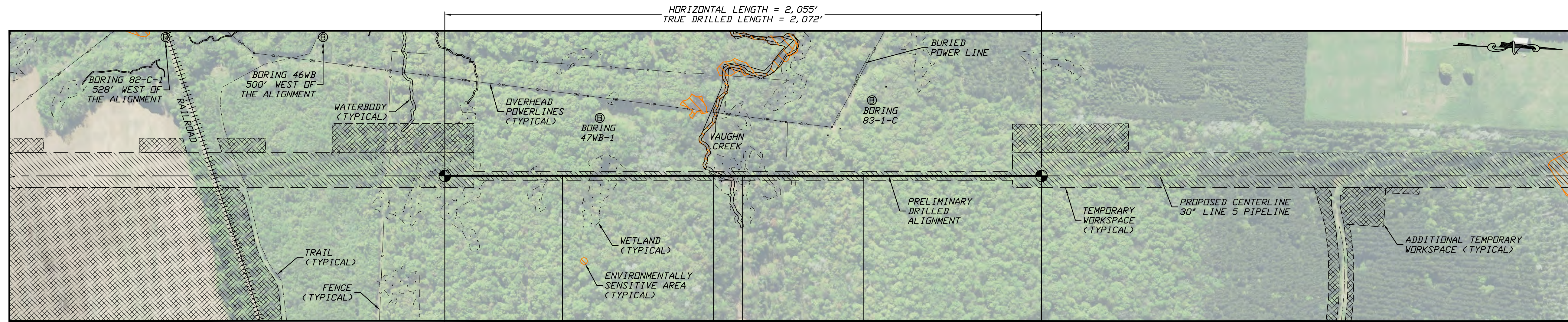
NO.	DATE	REVISION DESCRIPTION	BY	CHK'D	APP.
P1	07/24/20	ADD GEOTECH DATA & UPDATE BASE DATA	DMP	JDA	JSP

J.D. Hair & Associates, Inc.
Consulting Engineers

2424 East 21st Street
Suite 510
Tulsa, Oklahoma 74114

PROJECT NO.
Enbridge\1938

SHEET NUMBER
1



ENTRY POINT @ 10°
0+00.00, 1030.00
N 482808.89, E 1846043.21

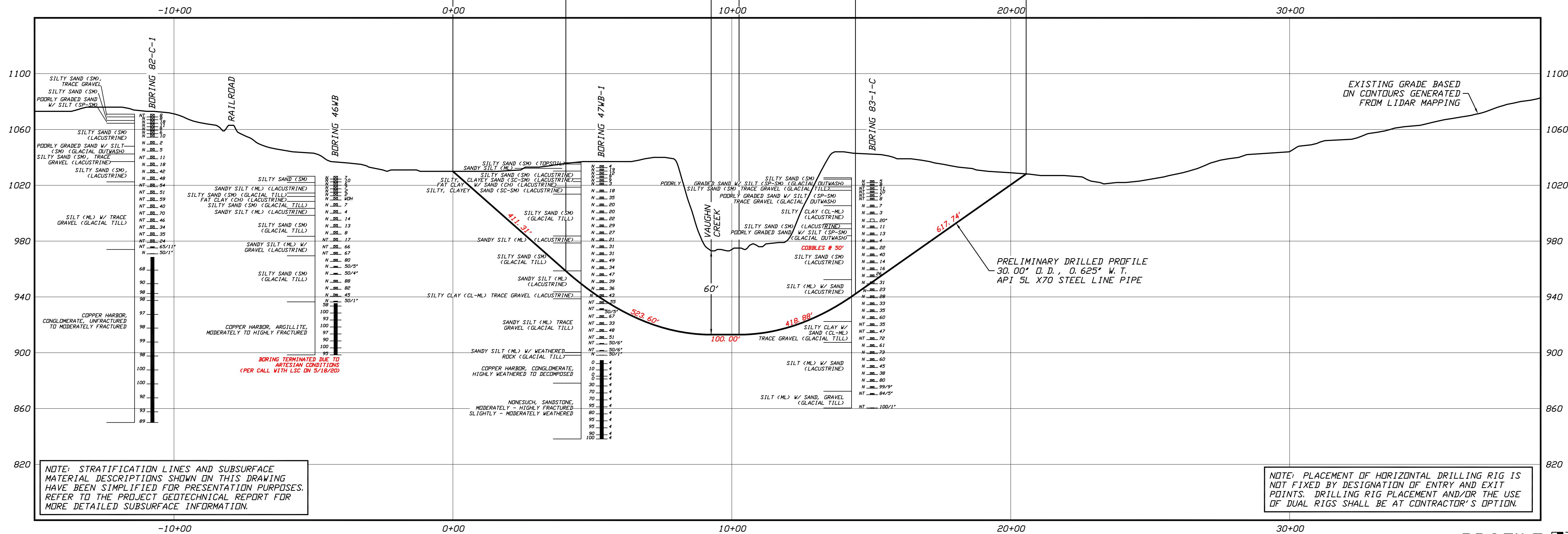
P. C. 10° SAG BEND
4+05.06, 958.58
RADIUS = 3,000'

P. T. 10° SAG BEND
9+26.01, 913.00

P. C. 8° SAG BEND
10+26.01, 913.00
RADIUS = 3,000'

P. T. 8° SAG BEND
14+43.53, 942.20

EXIT POINT @ 8°
20+55.25, 1028.17
N 484862.37, E 1845957.81



GENERAL LEGEND

- DRILLED PATH ENTRY/EXIT POINT
- ⊙ BORING LOCATION
- ⊞ 15" RECOVERY AMOUNT
- ⊞ 23 PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL
- ⊞ CORE BARREL SAMPLE
- ⊞ UCS 6, 250 UNCONFINED COMPRESSIVE STRENGTH (PSI)
- ⊞ 53.16 MOHS HARDNESS
- ⊞ ROCK QUALITY DESIGNATION (PERCENT)

GEOTECHNICAL NOTES

- GEOTECHNICAL DATA PROVIDED BY BRAUN INTERTEC, DULUTH, MINNESOTA. REFER TO THE PRELIMINARY BORING LOGS DATED APRIL & JUNE 2020 FOR MORE DETAILED SUBSURFACE INFORMATION.
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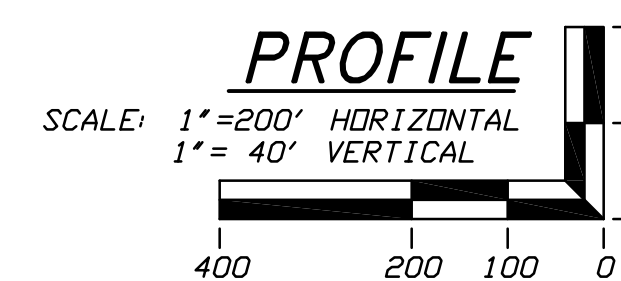
DRILLED PATH NOTES

- DRILLED PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENT.
- DRILLED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

PILOT HOLE TOLERANCES

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 - MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

PRELIMINARY - NOT FOR CONSTRUCTION

LINE 5 PIPELINE PROJECT		MP 39 - PLAN AND PROFILE		DRAWING LABEL		REVISION	
30-INCH PIPELINE CROSSING OF VAUGHN CREEK BY HORIZONTAL DIRECTIONAL DRILLING		IRON COUNTY, WISCONSIN		VAUGHN CREEK		P2	
DATE	CHECKED	APPROVED	SCALE	SHOWN FOR	D-SIZED PLOT		
01/30/20	KWW	JSP					
DMP							

NO.	DATE	REVISION DESCRIPTION	BY	CHECK'D	APP.
P2	07/23/20	ADD GEOTECH & UPDATE BASE DATA	DLB	JDA	JSP
P1	06/24/20	ADJUST THE DESIGN TO THE NEW LINE 5 ALIGNMENT	DLB	CDS	JSP

J.D.Hair & Associates, Inc.
Consulting Engineers
2424 East 21st Street
Suite 510
Tulsa, Oklahoma 74114

PROJECT NO.
Enbridge\1938
SHEET NUMBER
1