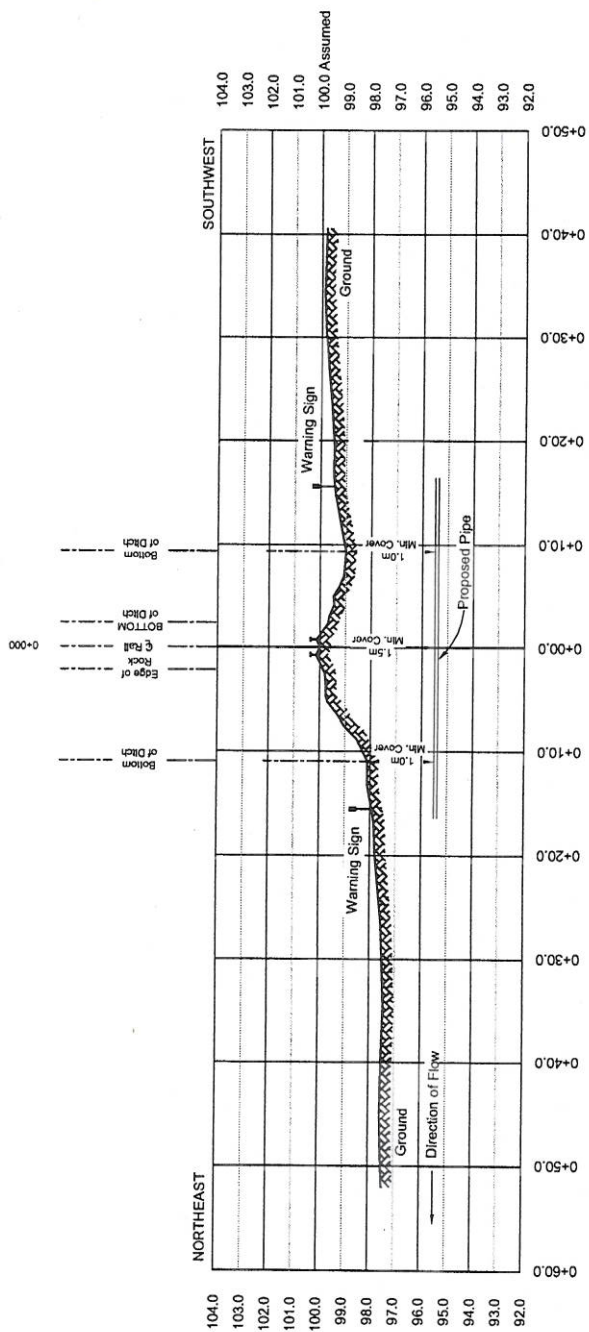


Appendix C

Crossings



Profile Along West Boundary of Proposed P/L RW
 Scales - 1 : 500 Horiz. 1 : 200 Vert.

CROSS-SECTION OF CANADIAN NATIONAL RAILWAY



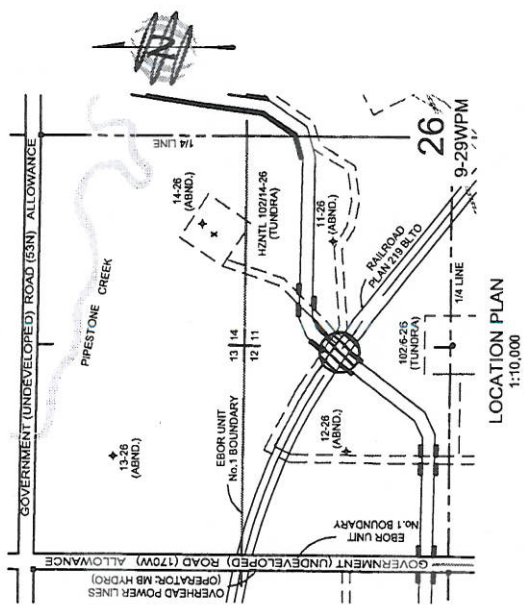
TUNDRA OIL & GAS PARTNERSHIP

SPECIFICATIONS

1. DISTANCE TO ROAD ALLOWANCE FROM PIPELINE CROSSING: 396m
2. CASING LENGTHS ARE 7m
3. BURIED PIPELINE WARNING MARKERS: CROSSING SIGNS AT EACH SIDE OF CASING.
4. NUMBER OF STABILIZERS:

NOTE:
 -DRILLING MUD PRESSURE USED TO KEEP HOLE OPEN
 -PULLING BACK PIPE THROUGH HOLE
 -NO SURFACE GROUND DISTURBANCE WITHIN CPR RIGHT-OF-WAY

TO BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH Canadian General Order E11 and E12 penalties to who crossing. These penalties also apply to the crossing of the railway tracks and Cable installations within Railway Right of Way, which shall be the minimum depth and encasement length requirements acceptable to CPR and the CSA specifications for overhead and underground systems. (CSA C22.3 No.1 & No.7)



NOTES: FOR 4" CENTRON SP 1000 STEEL CASING
 PIPE DIMENSIONS (NOMINAL)
 OUTSIDE Dia. (mm): 108.2
 INSIDE Dia. (mm):
 WALL THICKNESS (mm): 3.6 mtr.
 PIPE WEIGHT (kg/m):
 CENTERING DEVICE:
 SUPPORTS:
 SEALING DEVICE:
 TENSILE STRENGTH:
 COLLAPSE:
 BURST:
 METHOD OF INSTALLATION: HORIZONTAL CONTROLLED BORE

TUNDRA OIL & GAS PARTNERSHIP

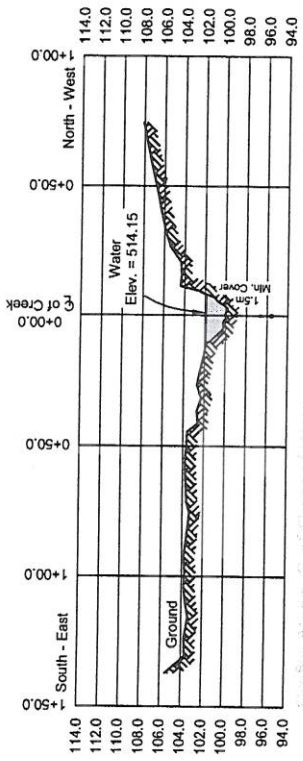
PLAN SHOWING 25m FLOWLINE RIGHT-OF-WAY CROSSING:
CANADIAN NATIONAL RAILWAY RIGHT-OF-WAY PLAN NO. 219 BLTO.
 WITHIN NW 1/4 SEC. 26 TWP. 9 RGE. 29 WPM
 R.M. of PIPESTONE

Scales as Shown
 Issued October 7, 2011

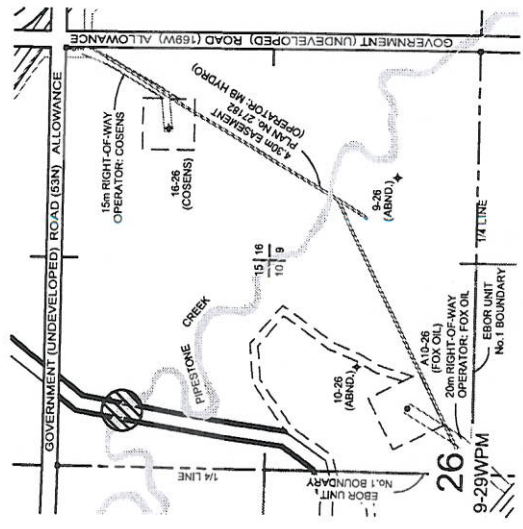


Altus Geomatics
 Manitoba
 Toll Free: 1-800-465-8233
 www.altusgeomatics.com

REVISION FILE: 143215X-45 ORIGINAL FILE:*



Profile Along 15m Right-of-Way
Scale: 1:2000 Horizontal, 1:500 Vertical



LOCATION PLAN
1:10,000

TUNDRA OIL & GAS PARTNERSHIP

PLAN SHOWING 25m FLOWLINE RIGHT-OF-WAY
CROSSING:
PIPESTONE CREEK
Located in
NE 1/4 SEC. 26 TWP. 9 RGE. 29WPM



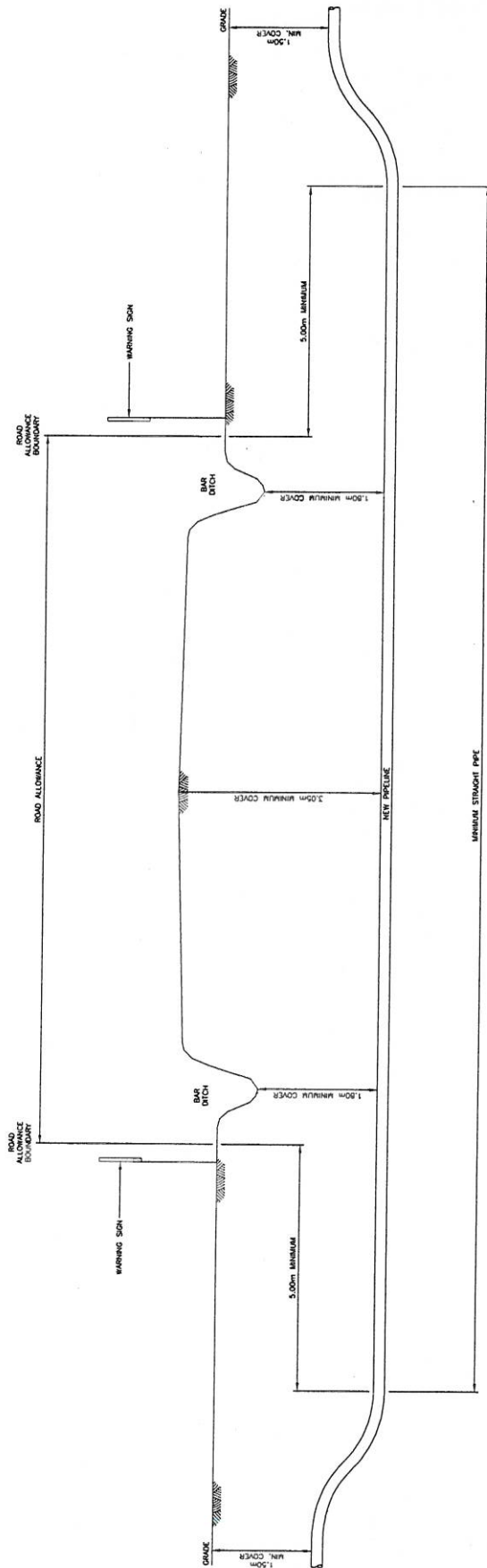
- NOTES: FOR 4" CENTRON SP 1000 STEEL CASING
PIPE DIMENSIONS (NOMINAL)
- OUTSIDE Dia. (mm): 108.2
 - INSIDE Dia. (mm): 100.2
 - WALL THICKNESS (mm): 3.6 mm
 - PIPE WEIGHT (kg/m):
 - CENTERING DEVICE:
 - SUPPORTS:
 - SEALING DEVICE:
 - TENSILE STRENGTH:
 - COLLAPSE:
 - BLURST:
 - METHOD OF INSTALLATION: HORIZONTAL CONTROLLED BORE

ISSUED October 7th, 2011
Scale: as Shown - Measurements in metres and decimals of a metre.
KEN W. BAILEY
MANITOBA LAND SURVEYOR
REVISION



TO BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH TC E-10, dated May 10, 2001, CSA STANDARD Z865-99, MB TRANSPORTATION, and MANITOBA PETROLEUM BRANCH REGULATIONS (Section 9)

DRF: CP CHK: PFS
FILE: 143215X-49



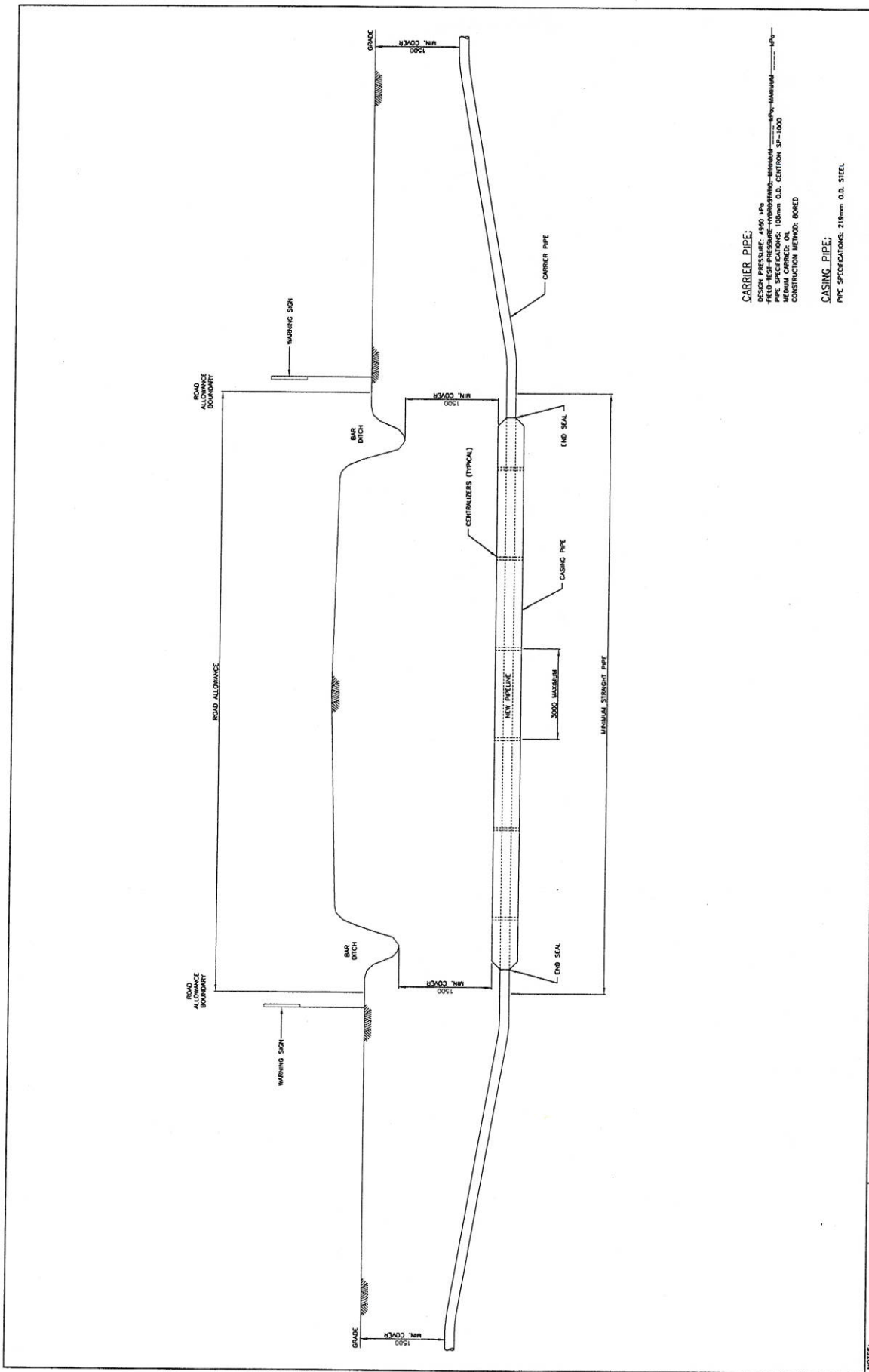
CARRIER PIPE:
 DESIGN PRESSURE: 4160 kPa
 MAXIMUM OPERATING PRESSURE: 4160 kPa
 MINIMUM OPERATING PRESSURE: 1034 kPa
 PIPE SPECIFICATIONS: 168mm O.D. X 4.0mm W.T. GR.359 CAPI SAUR CSA Z245.1
 PIPE-TYPE: PRESSURE-TREATED PIPE
 CORROSION PROTECTION: IMPRESSED CURRENT
 CONSTRUCTION METHOD: BORED

- NOTES:**
- MINIMUM COVER 7100mm OR LEAST, 1500mm ON R.O.W. OR AS OTHERWISE SPECIFIED IN THE DRAWINGS OR CONTRACT DOCUMENTS.
 - DESIGN PRESSURE AND CONDITIONS OF THE CROSSING AGREEMENT SHALL BE STRICTLY ADHERED TO.
 - DESIGN REQUIREMENTS SHALL APPLY TO THE PIPELINE FOR A MINIMUM DISTANCE OF 100m TO EITHER SIDE OF THE ROAD CROSSING MEASURED AT RIGHT ANGLES TO THE CENTERLINE OF THE PARALLEL SURFACE.
 - LEAST NOMINAL WALL THICKNESS AS FOLLOWS (APPLIED TO NOTE 3):

PIPE O.D. (OUTSIDE DIAMETER) (mm)	LEAST NOMINAL W.T. (WALL THICKNESS) (mm)
88.9	4.0
101.6	4.0
114.3	4.0
141.3	4.0
168.3	4.8
219.1	4.8
273.1	4.8
323.9	4.8

CONSULT AND CONFIRM WITH ENGINEER PRIOR TO CONSTRUCTION.

		ASHER ENGINEERING LTD.									
PROJECT NO. 156019301.dwg	SHEET NO. A1-1560-T-9301	DATE 11-10-07	SCALE N.T.S.								
TUNDRAL OIL & GAS PARTNERSHIP DALY SINCLAIR FIELD L.A.C.T. INSTALLATIONS AND SALES PIPELINES TYPICAL ROAD CROSSING DETAIL		REVISIONS <table border="1"> <thead> <tr> <th>REV.</th> <th>DESCRIPTION</th> <th>DATE</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		REV.	DESCRIPTION	DATE	BY				
REV.	DESCRIPTION	DATE	BY								
ENGINEER'S SIGNATURE 		CHECKED BY DATE 									
PROJECT NO. 1560		SHEET NO. N.T.S.									
PROJECT NO. 156019301.dwg		SHEET NO. A1-1560-T-9301									



CARRIER PIPE:
 DESIGN PRESSURE: 4860 MPa
 FIBER-REINFORCED-POLYMER-REINFORCED-BARRIER-PIPE-4860-1000
 MINIMUM O.D. CENTER SPACING: 100mm
 MINIMUM COVER: 1500mm
 CONSTRUCTION METHOD: BORED

CASING PIPE:
 PIPE SPECIFICATIONS: 219mm O.D. STEEL

ASHER ENGINEERING LTD.

TUNDRA OIL & GAS PARTNERSHIP
 DALY SINCLAIR FIELD
 L.A.C.T. INSTALLATIONS AND SALES PIPELINES
 TYPICAL CASED FIBERGLASS ROAD CROSSING DETAIL

PROJECT NO. 1560
 SCALE: N.T.S.
 DRAWING NO. A1-1560-T-9302

NO.	DATE	BY	CHKD	DESCRIPTION
1	11-10-07			ISSUED FOR REGULATORY APPROVAL

NO.	DATE	BY	CHKD	DESCRIPTION
1	11-10-07			ISSUED FOR REGULATORY APPROVAL

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE SPECIFIED.

