

Brian R. Bjella
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September 25, 2017

Mr. Darrell Nitschke
Executive Director
North Dakota Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, ND 58505-0480

Dear Mr. Nitschke:

In re: Cenex Pipeline, LLC
Case No. PU-17-097
Late Filed Exhibit #25
Our File No. 020836-000001

At the public hearing held in Minot on July 25, 2017, there was a discussion of the potential landslide area depicted on page A-47 of Cenex Pipeline, LLC's ("Cenex") application for a 10-inch pipeline.

Administrative Law Judge Dawson identified as late-filed Exhibit No. 25 to be a geotech investigation report and plan regarding geologically unstable areas.

Attached is Cenex's late-filed Exhibit No. 25, being a report prepared by Terracon Consultants, Inc. of Billings, Montana, regarding the area depicted on page A-47 on the Cenex application in an area described as the SW $\frac{1}{4}$ of Section 33, Township 154 North, Range 103 West, Williams County, North Dakota. Eleven copies of this report are attached hereto.

One of the alternatives for design and construction of the pipeline was described as Cut and Cover. This is described on page 3 of the report. Cenex hereby states that it is intending to utilize the Cut and Cover method through this area and will adhere to the recommendations of Terracon, which are as follows:

1. Align the pipeline to be perpendicular or nearly perpendicular to the contours.
2. Bury the pipeline deeply enough so that it will lie at a depth beneath the level of the shallow slip plane. Cenex will bury the pipeline at 8 feet.

3. Utilize native cohesive materials to backfill the trench. Compact the backfill to 95% of the maximum dry density and optimum moisture (-1 to +2%) per ASTM D698.
4. Provide drainage in order to prevent water from ponding or collecting near the top of the slope or along the excavation. Installation of water bars and appropriate reclamation will be completed.

Also attached is a Certificate of Service upon interested parties.

Should you have any questions please advise.

Very truly yours,



Brian R. Bjella

bw
enc.

cc: Administrative Judge Timothy J. Dawson (w/enc)
Derrick Braaten (w/enc)
Zachary Pelham (w/enc)
Kevin Pranis (w/enc)



September 12, 2017

Cenex Pipeline, LLC
Attn: Robb Schwend
802 Highway 212 South
P.O. Box 909
Laurel, MT 59044

Re: **CHS Sidney to Minot Slide Area – Williams County
SW Section 33, T154N, R103W, Williams County, North Dakota
Proposed 10-inch Diameter Pipeline
Terracon Project No. 26175044**

Dear Robb:

INTRODUCTION

Terracon Consultants, Inc. has completed the geotechnical services for an area in the SW¼ Section 33, T154N, R103W, Williams County, North Dakota, as referenced. Approximate lat/long for this area are 48° 06' 45.52" N, 103° 56' 25.31" W. The area is identified in the North Dakota data base as having historic landslides. See Exhibits 1 and 2 for general location. This letter presents the results of our limited geotechnical investigation regarding:

- Site topography;
- Conditions of the slopes; and
- Design alternatives for traversing the area with a pipeline.

PROJECT INFORMATION

At this site, the pipeline would cross an unnamed tributary to Eightmile Creek. The proposed corridor, of approximate 200-foot width, approaches the drainage from the south, then crosses the drainage on a line that runs toward the north-northwest. See Exhibit 3 of 6, which shows the approximate layout of the corridor and contours of the valley crossing, and see Exhibit 4 of 6 showing Section A-A' approximately through the center of the proposed corridor.

The unnamed tributary to Eightmile Creek is ephemeral. There are some wetland areas in the bottom of the drainage. A small earth dam, most likely to create a stock-watering pond in a side drainage, immediately upstream from the corridor, has been breached.

Terracon Consultants, Inc. 2110 Overland Avenue, Suite 124 Billings, Montana 59102
P [406] 656 3072 F [406] 656 3578 terracon.com

Geotechnical



Environmental



Construction Materials



Facilities

SITE AND SUBSURFACE CONDITIONS

On the south side of the valley, the slope is north-facing and exhibits small, shallow active landslides. The slides on this side of the valley appear to occur in the lower half of the slope. One such small slide is shown in Exhibit 4 of 6 as Section B-B'. This slide has a sharp, unvegetated head scarp, but the depression below the head scarp appears to drain. The toe is relatively small, and the flanks are shallow, indicating that the slide is relatively shallow, estimated to have a depth of less than 5 feet. The general slope on the south side of the drainage is approximately 23° and is steepened in the head scarp to approximately 34°

On the section through this slide, coordinates are shown, which were used in layouts for slope-stability analysis. A sample of the soil was taken from the head scarp and was transported to our laboratory for analysis. Results of our limited testing follow:

■ Soil Classification	Lean Clay
■ Percent Fines (%)	94%
■ Plasticity Index, PI	29%
■ Moisture Content	11%

Terracon has performed limited slope stability analysis for the landslide depicted by Section B-B'. For the slope in its current condition, parameters as may be expected for the soils encountered have been selected that would yield a factor of safety against sliding of 1.0 (FS = 1.0), or a condition of imminent failure. Slope failures are more likely when the soils are saturated, such as during the spring of the year. Using these parameters and a number of chosen slip surfaces, it appears that a FS of 1.25 or higher can be attained for a surface with a depth of approximately eight (8) feet or deeper.

On the north slope of the valley, the slope is south facing and exhibits small, shallow active landslides, and the topography is marked by hummocky areas. One shallow landslide is depicted on Exhibit 5 of 6 as Section C-C'. Section C-C' is along the west side of the proposed right-of-way. This slide appears to be one of the areas outlined as on the North Dakota landslide map.

For the slope on the north side of the valley, the slope length and character of the active slides are similar to the slope on the south side of the valley, and slope stability analyses would yield similar results. A potential profile with the pipeline shown at a depth of 8 feet is shown on Section A-A' on Exhibit 4 of 6. It is assumed that the 8-foot burial would be maintained through the valley floor to account for channel scour.

ALTERNATIVES FOR DESIGN AND CONSTRUCTION

Terracon has identified three alternatives for crossing the valley associated with this unnamed tributary to Eightmile Creek: 1) cut and cover; 2) HDD; and 3) choose an alternate route.

Cut and Cover. Cut and cover is technically feasible through this landslide area, as long as design and construction will adhere to the following:

- Align the pipeline to be perpendicular or nearly perpendicular to the contours.
- Bury the pipeline deeply enough so that it will lie at a depth beneath the level of the shallow slip plane. In this case, our preliminary estimates indicate a depth on the order of 8 feet would be sufficient.
- Utilize native cohesive materials to backfill the trench. Compact the backfill to 95% of the maximum dry density and optimum moisture (-1 to +2%) per ASTM D698.
- Provide drainage in order to prevent water from ponding or collecting near the top of the slope or along the excavation. Installation of water bars and appropriate reclamation are recommended.

HDD. A potential plan and profile for an HDD crossing has been developed using the site data and is provided on Exhibit 6 of 6. This layout is somewhat conceptual, as no geologic profiles are available. In order to prepare an appropriate report, we would recommend a geotechnical drilling program with accompanying observations and calculations related to pullback forces and potential for hydraulic fracturing. The potential profile shown was developed using criteria consistent with a 10-inch welded steel pipeline:


- Preferably a 12° or less entry/exit angle;
- Allowing for a minimum tangent of 40 feet from the entry/exit point before initiating a curve;
- A bend radius of curvature for vertical or compound vertical and horizontal curves of a minimum of 1,000 feet; and,
- Preferably allowing for a depth of cover over the bore path as it passes beneath water bodies of 40 feet, 20 feet beneath ephemeral drainages, or 10 feet within competent bedrock.

For the potential HDD profile shown on Exhibit 6, the total horizontal length is 835 feet with a total pipe length required of 849 feet.

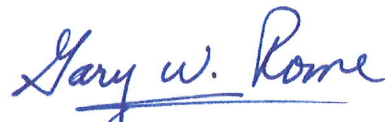
Choose an Alternate Route. The third alternative for crossing this valley is to choose an alternate route that would have shorter and/or flatter slopes. In this instance, the valley could be crossed by shifting the route to the east of the currently proposed right-of-way. In this alternate alignment, the slopes also are marked by shallow slides, but the slopes are much shorter, reducing the possibility for a deeper slide to affect the pipeline.

We appreciate the opportunity to work with you on these projects. If there are any questions, please call.

Sincerely,
TERRACON



AJ Torres, P.E.
Senior Staff Engineer

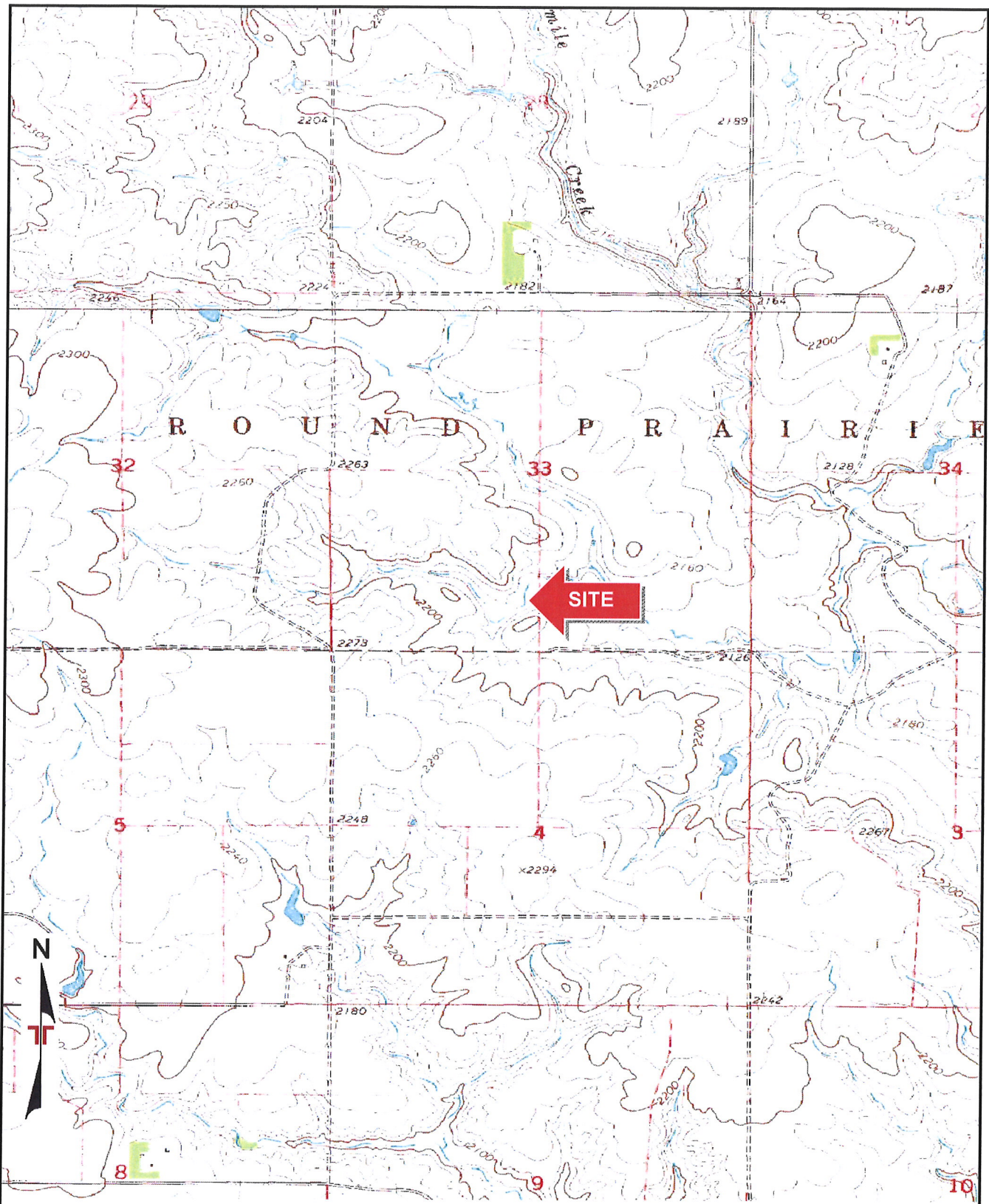


Gary W. Rome, P.E.
Senior Principal

Reviewed by: Dan C. Nebel

Enclosures

Exhibits



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
 QUADRANGLES INCLUDE: TRENTON NW, ND (1/1/1974) and TRENTON SW, ND (1/1/1968).

Project Manager:	GR
Project No.:	26175044
Drawn by:	AT
Scale:	1"=2,000'
Checked by:	-
File Name:	Site 1
Approved by:	-
Date:	August 2014

Terracon
 2110 Overland Ave Ste 124
 Billings, MT 59102-6440

USGS Location
Tributary to Eightmile Creek West of Williston Cenex Pipeline, LLC Proposed Refined Fuels Line

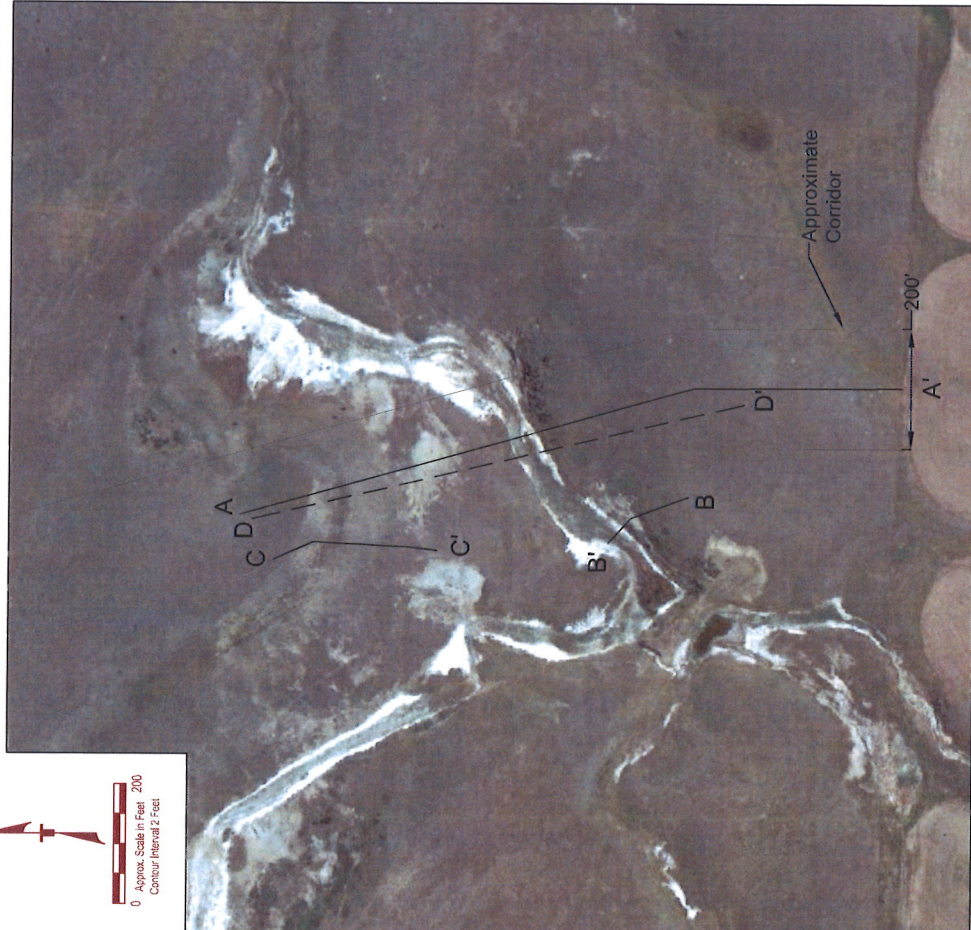
Exhibit
1



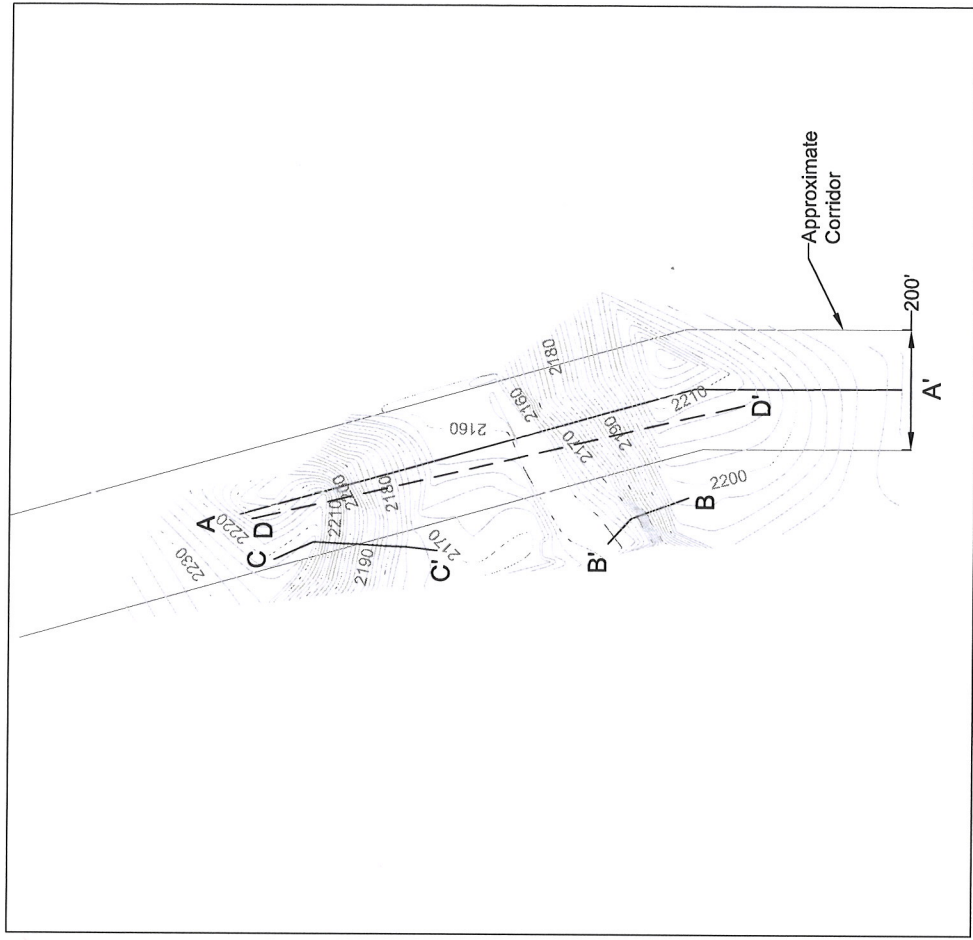
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager: GR	Project No. 26175044	 2110 Overland Ave Ste 124 Billings, MT 59102-6440	Aerial Location	Exhibit
Drawn by: AT	Scale: AS SHOWN		Tributary to Eightmile Creek West of Williston Cenex Pipeline, LLC Proposed Refined Fuels Line	2
Checked by: -	File Name: Site 1			
Approved by: -	Date: August 2014			



Aerial Image Excerpted from Google Earth Dated May 2017



Terracon Generated Topographic Detail

REV.	DATE	BY	DESCRIPTION


Terracon
 Consulting Engineers and Scientists
 2110 Overland Avenue, Suite 124
 Billings, MT 59102
 PH: (406) 556-3072 FAX: (406) 556-3076

Williams County
North Dakota

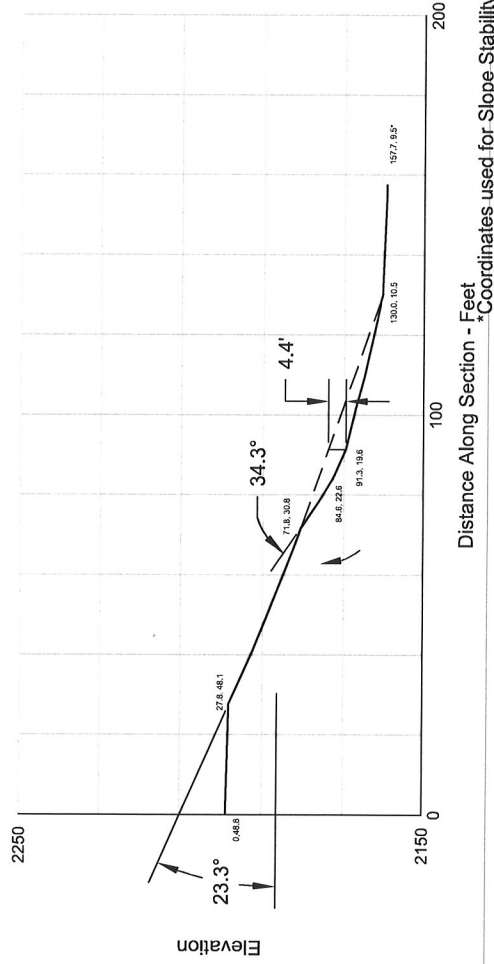
Plan and Contours
 Tributary to Eightmile Creek West of Williston
Genex Pipeline, LLC
 Proposed Refined Fuels Line

DESIGNED BY:	J. Grone	3 OF 6	
DRAWN BY:	J. Grone		
APP'D BY:	A.J. Torres		
SCALE:	As Shown		
DATE:	2/28/2017		
FILE NAME:	SHA 1 - Corridor Raw Data		
SHEET NO.:	3	OF	6

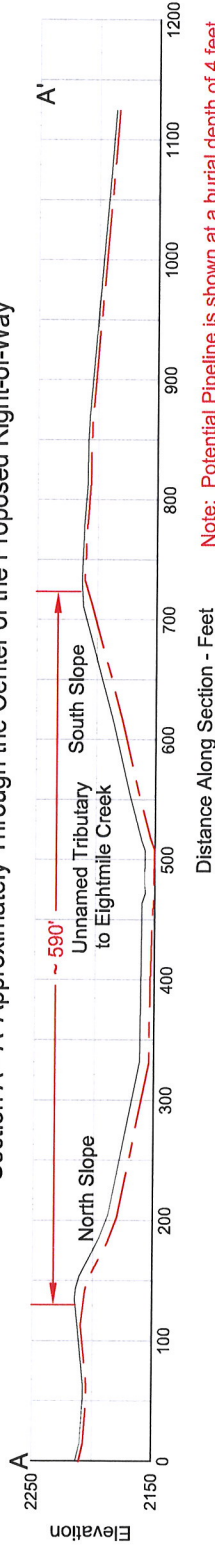


Pic Shows Approximate Trace of Section B-B'

Section B - B' Typical Section Through Shallow Slide on South Slope



Section A - A' Approximately Through the Center of the Proposed Right-of-Way



REV.	DATE	BY	DESCRIPTION
1	8/30/17	AT	Added pipe profile on Section A-A'

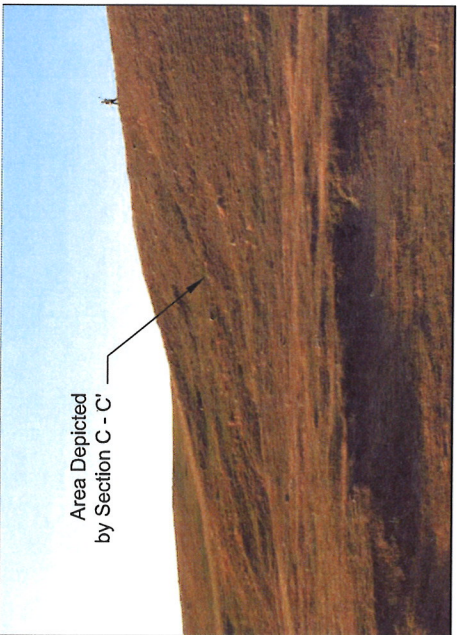
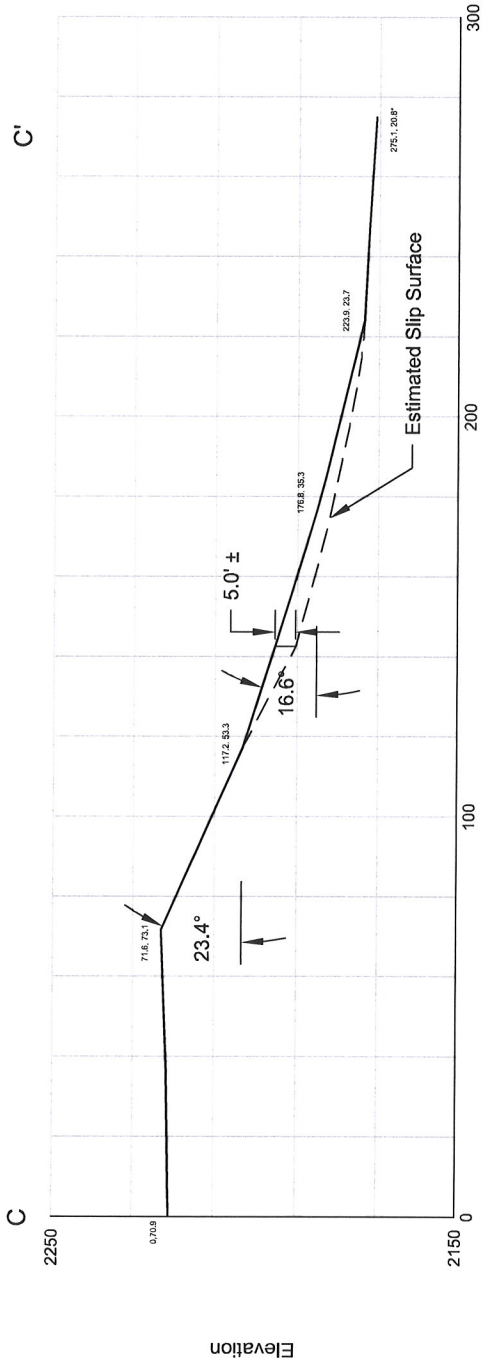
Terracon
 Consulting Engineers and Scientists
 2110 Overland Avenue, Suite 124
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 PH: (406) 556-3072 FAX: (406) 556-3575

Williams County
 North Dakota

Valley Section Along ROW, Section A-A', and Slope B-B' Section
 Tributary to Eightmile Creek West of Williston
Cenex Pipeline, LLC
 Proposed Refined Fuels Line

DESIGNED BY:	GRBme	4
DRAWN BY:	AJ/Tomes	
APPROV. BY:	AS/Shearn	
SCALE:	20/12500	
SUB NO.	20/12500	
FILE NAME:	Site 1 - Corrected Raw Data	
SHEET NO.:	4	OF 6

Section C - C' Typical Section Through Shallow Slide on North Slope



*Coordinates used for Slope Stability Analysis

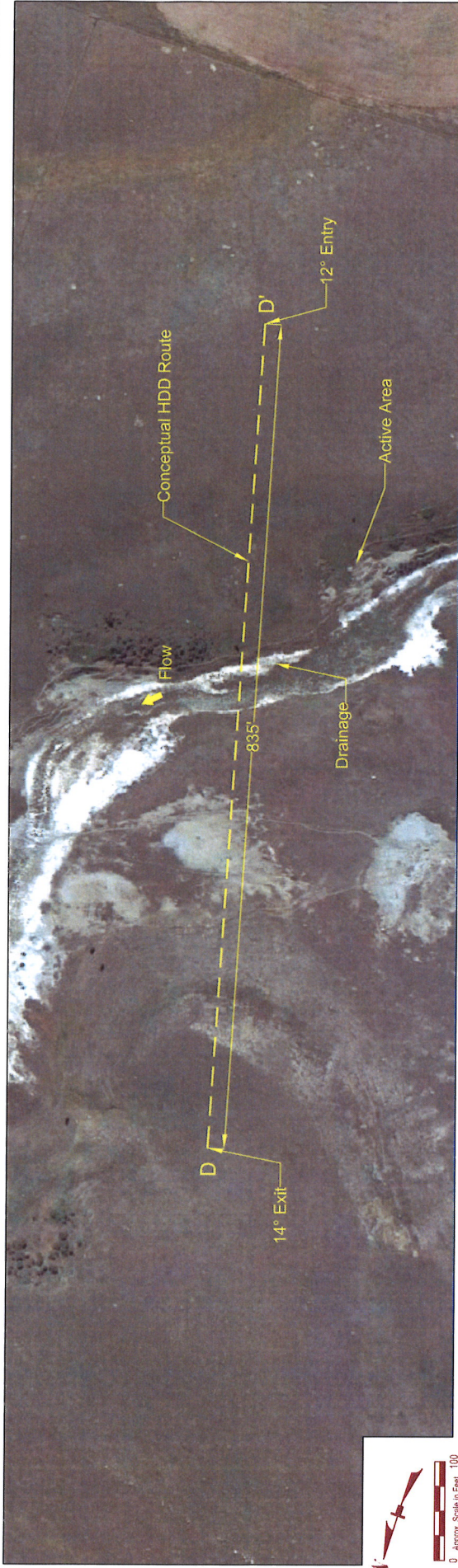
Pic Shows Slump Area Depicted by Section C-C'

REV.	DATE	BY	DESCRIPTION

Terracon
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 2110 Overland Avenue, Suite 124
 Billings, MT 59102
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Slope Section - Shallow Slump on North Slope - Section C-C'
 Tributary to Eightmile Creek West of Williston
Cenex Pipeline, LLC
 Proposed Refined Fuels Line
 Williams County
 North Dakota

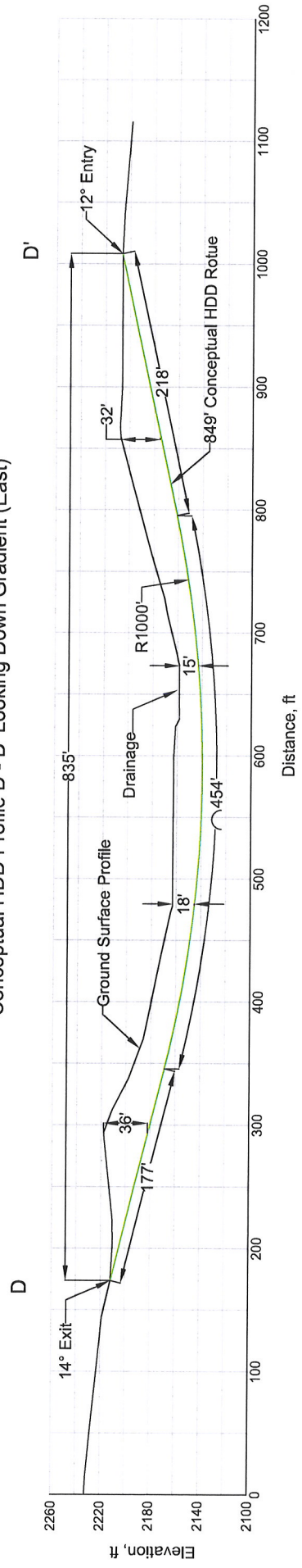
DESIGNED BY:	GRome	5
DRAWN BY:	GRome	
CHECKED BY:	AJ Tombs	
DATE:	04/25/2017	
JOB NO.:	2675044	
FILE NAME:	Shl. 1 - Corrected Raw Data	
SHEET NO.:	5	OF 6



Aerial Image Excerpted from Google Earth Dated May 2017



Conceptual HDD Profile D - D' Looking Down Gradient (East)



REV	DATE	BY	DESCRIPTION
1	8/30/17	A.T.	Revised Radius of Curvature to .1,000'

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 Consulting Engineers and Scientists
 Billings, MT 59102
 2110 Overland Avenue, Suite 124
 PH: (406) 656-3072
 FAX: (406) 656-3578

Potential HDD Plan and Profile
 Tributary to Eightmile Creek West of Williston
Genex Pipeline, LLC
 Proposed Refined Fuels Line

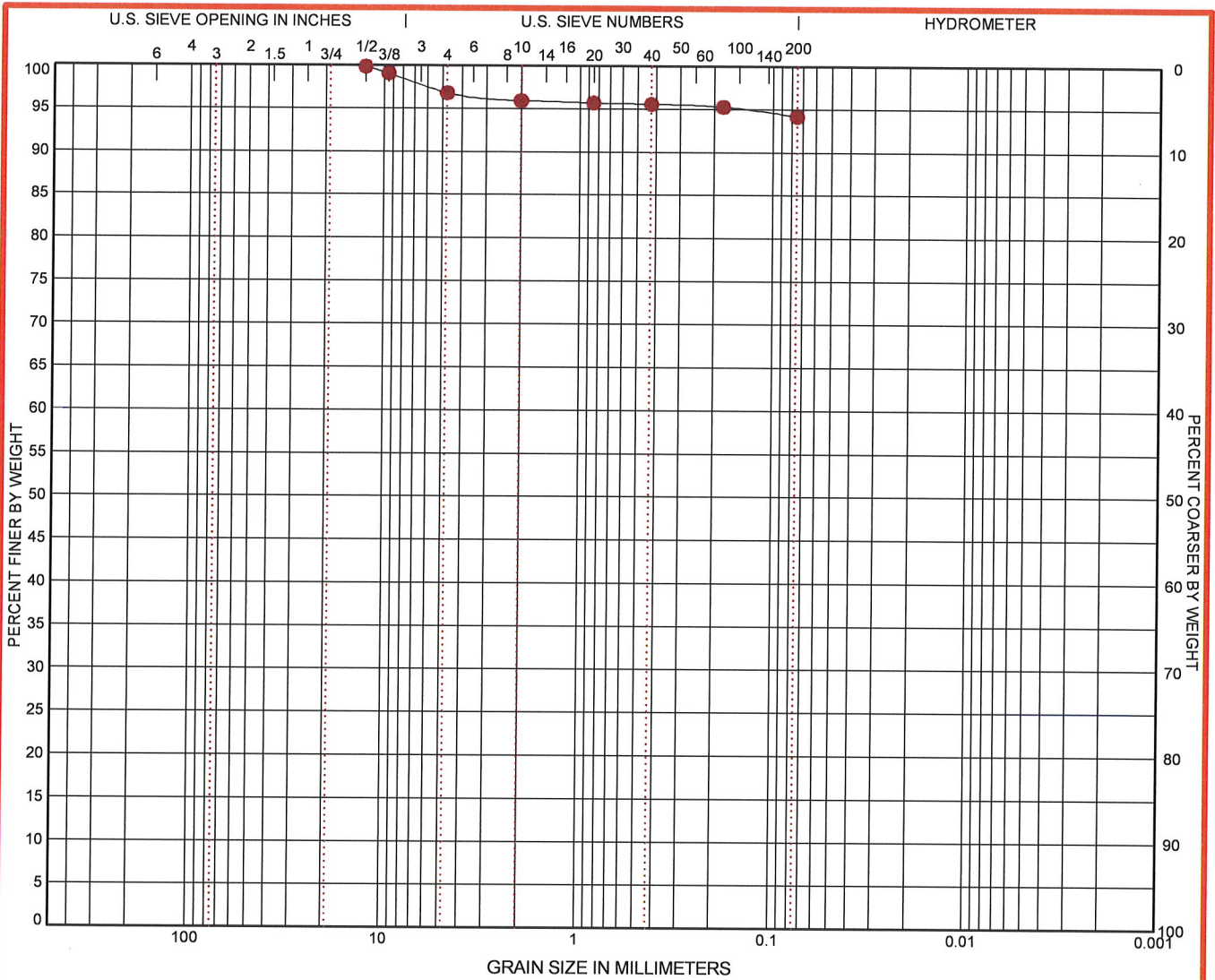
Williams County
 North Dakota

DESIGNED BY:	SBorne
DRAWN BY:	A.Torres
CHECKED BY:	A.Swan
SCALE:	As Shown
DATE:	August 2017
JOB NO.:	2872504
FILE NAME:	Shl 1 - Concept Plan.Dwg
SHEET NO.:	6 OF 6

Laboratory Results

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY	
	coarse	fine	coarse	medium	fine		

BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
● Eightmile Crk.	0		3.0	2.6		94.2		CL

GRAIN SIZE			
D ₆₀	●		
D ₃₀			
D ₁₀			

Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1/2"	99.82				
3/8"	99.05				
#4	96.79				
#10	95.91				
#20	95.67				
#40	95.56				
#80	95.26				
#200	94.17				

SOIL DESCRIPTION
● LEAN CLAY (CL)

COEFFICIENTS			
C _c	●		
C _u			

REMARKS
●

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 26175044 CHS SIDNEY TO MIN - TRIAL 2.GPJ TERRACON_DATATEMPLATE.GDT 9/12/17

PROJECT: CHS Sidney to Minot Slide Area	<p>2110 Overland Ave Ste 124 Billings, MT</p>	PROJECT NUMBER: 26175044
SITE: Williams County, ND		CLIENT: Cenex Pipeline, LLC Laurel, MT

**STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION**

**Cenex Pipeline, LLC
10" Refined Fuels Pipeline – Williams, Mountrail, Ward
Siting Application**

PU-17-097

CERTIFICATE OF SERVICE

I hereby certify that on September 25, 2017, the following document:

1. Late Filed Exhibit No. 25 – Report prepared by Terracon Consultants, Inc. of Billings, Montana, regarding the area depicted on page A-47 on the Cenex application in an area described as the SW¼ of Section 33, Township 154 North, Range 103 West, Williams County, North Dakota.

was served via U.S. mail and e-mail upon the following:

Derrick Braaten
Baumstark Braaten Law Partners
109 North 4th St., Suite 100
Bismarck, ND 58501-4003
derrick@baumstarkbraaten.com

Zachary Pelham
Special Assistant Attorney General
PO Box 400
Bismarck, ND 58502-0400
On behalf of the PSC
zep@pearce-durick.com

Timothy J. Dawson
Administrative Law Judge
Office of Administrative Hearings
2911 North 4th Street, Suite 303
Bismarck, ND 58503
tjdawson@nd.gov

Kevin Pranis
Laborers District Council
81 E. Little Canada Road
St. Paul, MN 55117
kpranis@lunauroc.com

Dated this 25th day of September, 2017.

CROWLEY FLECK PLLP
Attorneys for Cenex Pipeline, LLC
100 West Broadway, Suite 250
P.O. Box 2798
Bismarck, North Dakota 58502
(701) 223-6586

By 
BRIAN R. BJELLA (#03549)