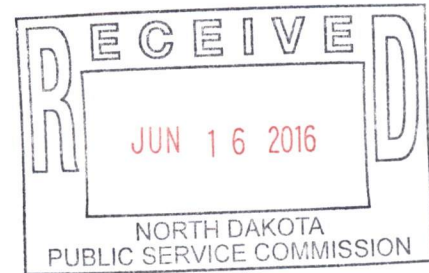


June 16, 2016

VIA HAND-DELIVERY

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



**Re: Dakota Access, LLC
Case No. PU-14-842**

Dear Mr. Nitschke:

Enclosed for filing in the above captioned matter, please find an original copy and ten (10) additional copies of the Memorandum from GeoEngineers regarding Dakota Access, LLC's Reroute Location 50. Also enclosed is a disk containing the memorandum in PDF format.

Dakota Access also herein requests that the Commission separate Reroute Location 50 into two parts for purposes of approval to begin construction. The Commission has raised a concern regarding a geologically unstable area located in Section 35, Township 148 North, Range 96 West in Dunn County, North Dakota, which is a small portion of Reroute Location 50. The entirety of Reroute Location 50 is 3.47 miles in length outside of the original PSC corridor. A significant portion of the reroute is located north of the Little Missouri River in Sections 23, 24, and 26, Township 148 North, Range 96 West in Dunn County, North Dakota. The area of concern is limited to the south of the Little Missouri River.

Dakota Access requests the Commission allow for construction of the portion of Reroute Location 50 north of the Little Missouri River on Three Affiliated Tribes land where there is no concern as to geologically unstable areas. Dakota Access will wait for further authorization from the Commission before commencing construction south of the Little Missouri River in the area of concern. Dakota Access is experiencing substantial delays to the project and incurring significant expense while the concern is being resolved with respect to only a portion of Reroute Location 50. Accordingly, Dakota Access requests approval to construct the portion of Reroute Location 50 north of the Little Missouri River as soon as possible.

Attorneys & Advisors
main 701.221.8700
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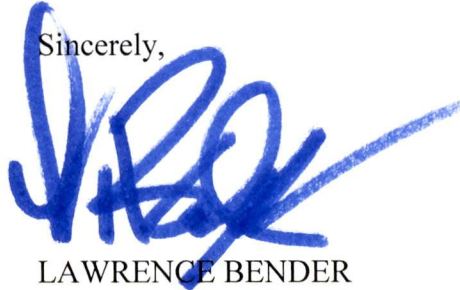
Fredrikson & Byron, P.A.
1133 College Drive, Suite 1000
Bismarck, North Dakota
58501-1215

188 PU-14-842 Filed: 6/17/2016 Pages: 13
Memorandum from GeoEngineers regarding reroute location 50

Mr. Darrell Nitschke
June 16, 2016
Page 2

Should you have any questions, please advise.

Sincerely,

A handwritten signature in blue ink, appearing to read 'L. Bender', with a long horizontal stroke extending to the right.

LAWRENCE BENDER

LB/dmk
Enclosures

cc: Mr. Zachary Pelham (via e-mail)
Ms. Julie Prescott (via e-mail)

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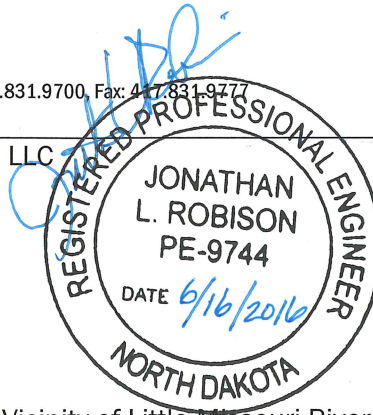
To: Mike Futch, Dakota Access, LLC

From: Ben Cashman
Craig Erdman
Jon Robison, PE

Date: June 16, 2016

File: 18782-011-00

Subject: MP 16.5 Drainage Feature, Vicinity of Little Missouri River Crossing,
Dakota Access Pipeline Project, North Dakota



INTRODUCTION

At the request of Dakota Access, LLC (Dakota Access), GeoEngineers, Inc. (GeoEngineers) completed a geologic hazards evaluation for the Dakota Access Pipeline (DAPL) proposed routing in the vicinity of the Little Missouri River; this evaluation was summarized in our memorandum dated May 31, 2016. Subsequent to this work, Dakota Access requested that we review a ground movement feature of interest near a prominent bedrock butte at approximate proposed Dakota Access milepost (MP) 16.5. The feature of concern occurs where the proposed Dakota Access alignment is parallel to an existing Bridger Pipeline, LLC (Bridger) pipeline right of way (ROW). The location of the feature of interest is shown on the attached Vicinity Map, Figure 1.

In addition to the Bridger pipeline, the proposed DAPL alignment is also parallel in this area to the former location of a Dakota Gasification Company (DGC) carbon dioxide pipeline. We understand from a letter from DGC to the North Dakota Public Service Commission dated June 7, 2011 that the ROW west of the bedrock butte had "caved-in" sometime prior to a routine pipeline patrol conducted on May 25, 2011. The event resulted in the Bridger line and the parallel DGC line becoming exposed with unsupported spans of undocumented length. The exact cause of the "cave-in" is largely unknown, but photographs in the letter referenced above suggest that it was probably a mass wastage slope failure (landslide) as opposed to a sinkhole. In their letter, DGC suggests that the failure occurred in fill material that was placed using "slipshod construction practices on Bridger's pipeline." Furthermore, according to DGC's letter, timing of construction was also key, since stormwater runoff appears to have been handled improperly, resulting in saturated soil and ponded water. Based on our review of aerial photography available on Google Earth Pro, a former drainage gully aligned roughly perpendicular to the ROW had been filled in prior to 2011 to construct the Bridger/DGC ROW. We understand that DGC has since rerouted their carbon dioxide line around the east side of the bedrock butte and no longer shares the ROW with Bridger's line. The ground in the vicinity of the cave-in/slope failure has since been regraded with fill material. We understand the proposed DAPL alignment is parallel to and west (downslope) from the Bridger ROW.

On June 6, 2016 Mike Futch of Dakota Access requested that GeoEngineers complete an evaluation of the regraded fill with respect to future risk to the proposed Dakota Access pipeline. We mobilized to the site and completed a site reconnaissance to document observations of the site conditions.

SITE RECONNAISSANCE SUMMARY

An engineering geologist from GeoEngineers completed a site reconnaissance on June 9, 2016. The following is a brief summary of observations made within and surrounding the filled drainage feature near proposed DAPL MP 16.5. Key features described below are shown on the attached site plan (Figure 2) and site photographs taken during the reconnaissance are shown in Figures 3 through 8.

We observed the area of regraded fill placed within a former ephemeral stream drainage (observed on aerial imagery taken prior to 2011). The fill area generally slopes down to the west and is located immediately west of a prominent bedrock butte topographic feature. The fill area covers an area of approximately 50,000 square feet and is buttressed to the northwest by two roughly parallel fill berms that have been constructed across the former axis of the drainage gully. The berms roughly coincide with a 30-foot-tall natural bedrock buttress that created a bottleneck within the former drainage.

The lower fill berm is approximately 110 feet long and rises about 8 feet above the native underlying topography downstream. The outboard slope of the lower berm is inclined to approximately 50 percent, and the berm crest plunges at approximately 10 percent to the south-southwest. The upper berm is about 205 feet long and rises approximately 10 to 12 feet above the lower berm. The outboard slope of the upper berm is inclined to about 55 percent. The inboard slope of the berm is about 2 feet tall, and the fill slope rises to the southeast (upslope) of the berm and is uniformly inclined to about 20 percent. The material used to construct the fill berms is gray sandy silt that appears to be derived from the local soil and soft bedrock excavated from elsewhere on site. We did not observe evidence that granular drainage layers or other imported materials were used underneath the silty sand fill.

An ephemeral stream channel was observed along the south and western boundaries of the fill area. The channel is likely the result of the former stream course displaced by the placement of fill. The channel originates at a drainage immediately south of the bedrock knob, where it flows from an established 4-foot-deep natural channel onto the graded fill area of the ROW. The channel has incised approximately 1 foot into the eastern portion of the ROW fill. The channel drains approximately northwestward across the ROW and then follows the western boundary of the fill along the toe of a steep, 12-foot-tall northeast-facing embankment. The channel then alternates from incised to aggraded as it continues northwestward across the ROW, with a short span east of the Bridger line where it disappears beneath the surface and re-emerges into an incised segment downstream.

In general, the channel becomes increasingly more incised (up to 5 feet deep) as it continues northwestward along the west boundary of the fill. The channel then makes a sharp bend to the right (northeast) near the northwestern extent of the fill and increases in depth to approximately 7 feet. The channel meanders back to the left (northwest) downgradient of the natural rock buttress. An abrupt nickpoint is migrating headward in the channel from the west side of the ROW towards the Bridger line. We observed two small tributary channels incised into the fill area, one of which originates at the downslope end of the upper fill berm. We observed a 6-inch-diameter corrugated plastic drain pipe daylighting into the main stream channel in this vicinity. The drain pipe was partially filled with sediment and was not producing any flow at the time of our visit. The source or intended function of the drainpipe is unknown. We did not observe any other drainage pipes or structures at the site.

We observed the headscarp of the 2011 slope failure event that exposed the DGC and Bridger pipelines. The scarp is near vertical, approximately 280 feet long and is approximately 25 feet tall above the existing regraded fill surface. The northern portion of the scarp has been regraded to 65 percent.

We did not observe ground tension cracks, downsets, or newly-forming scarps anywhere in the vicinity of the regraded fill to indicate recent slope creep or incipient landsliding. Further, we observed no springs, seepage, or evidence of recent seepage emanating from the subsurface anywhere on the slope.

SUMMARY AND RECOMMENDATIONS

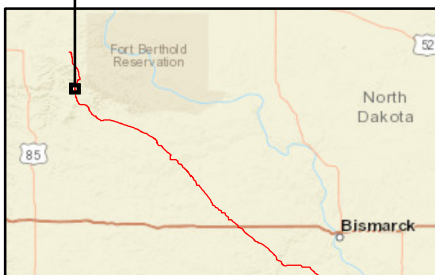
With the exception of actively incising ephemeral stream channels crossing the regraded fill area, we observed no evidence of recent or incipient slope instability in the fill during our site reconnaissance. Furthermore, we observed no evidence of recent slope instability in the vicinity surrounding the regraded fill area that would suggest a larger scale slope instability condition underlying the fill area. The regraded fill generally appeared to be intact with young vegetation (grasses and small shrubs) becoming established. Our reconnaissance was completed during a dry period in which there was no flowing or standing water observed in any of the drainage channels, or elsewhere on the site, and no saturated or wet soils observed at the surface. However, it is possible that times of heavy or prolonged precipitation or snow melt may saturate soils (including the fill) and may decrease the overall stability of the fill area.

The abundant evidence of actively incising stream channels cutting into the fill along the southern and western margins of the fill is of concern for the existing Bridger Pipeline, as these channels have abrupt nickpoints that appear to be migrating headward towards the Bridger line. If left unaddressed by Bridger, these channels and new channels may create a time-independent risk for the fill in the vicinity of the proposed Dakota Access pipeline.

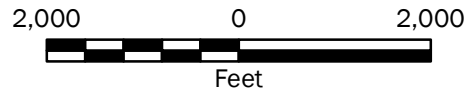
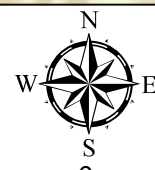
Based on our field observations of the height of the upper buttress berm above the lower natural bedrock buttress downslope to the west (an elevation difference of about 12 to 15 feet), the fill is likely about 15 feet thick above the underlying native slope in this area. Depending on the nature of the underlying topography that was present before the fill was placed (such as possible stream channels or other irregularities in the surface that were buried), it is possible that the fill locally exceeds 20-25 feet in some areas. The potential for the time-independent risk to the Dakota Access pipeline associated with the existing fill may be reduced by installing the pipeline in the native soil/bedrock that underlies the fill.

Summarizing, based upon our observations of site conditions, and our review of historic aerial photography, geologic mapping, and other data, we conclude that the 2011 "cave in" event was precipitated by the fill construction and ROW drainage practices associated with the Bridger pipeline. We understand that Dakota Access intends to install its pipeline in the native soils underlying the fill either via a deep open cut or horizontal directional drilling; this will reduce the time-independent risks associated with the fill area stability and the growth of the erosional features.

We appreciate the opportunity to be of continued service to Dakota Access on this project. Please let us know if you have any questions.



● Milepost
 — Proposed DAPL Route



Vicinity Map

Drainage Feature MP 16.5
 Proposed DAPL Main Line
 Dunn County, North Dakota

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

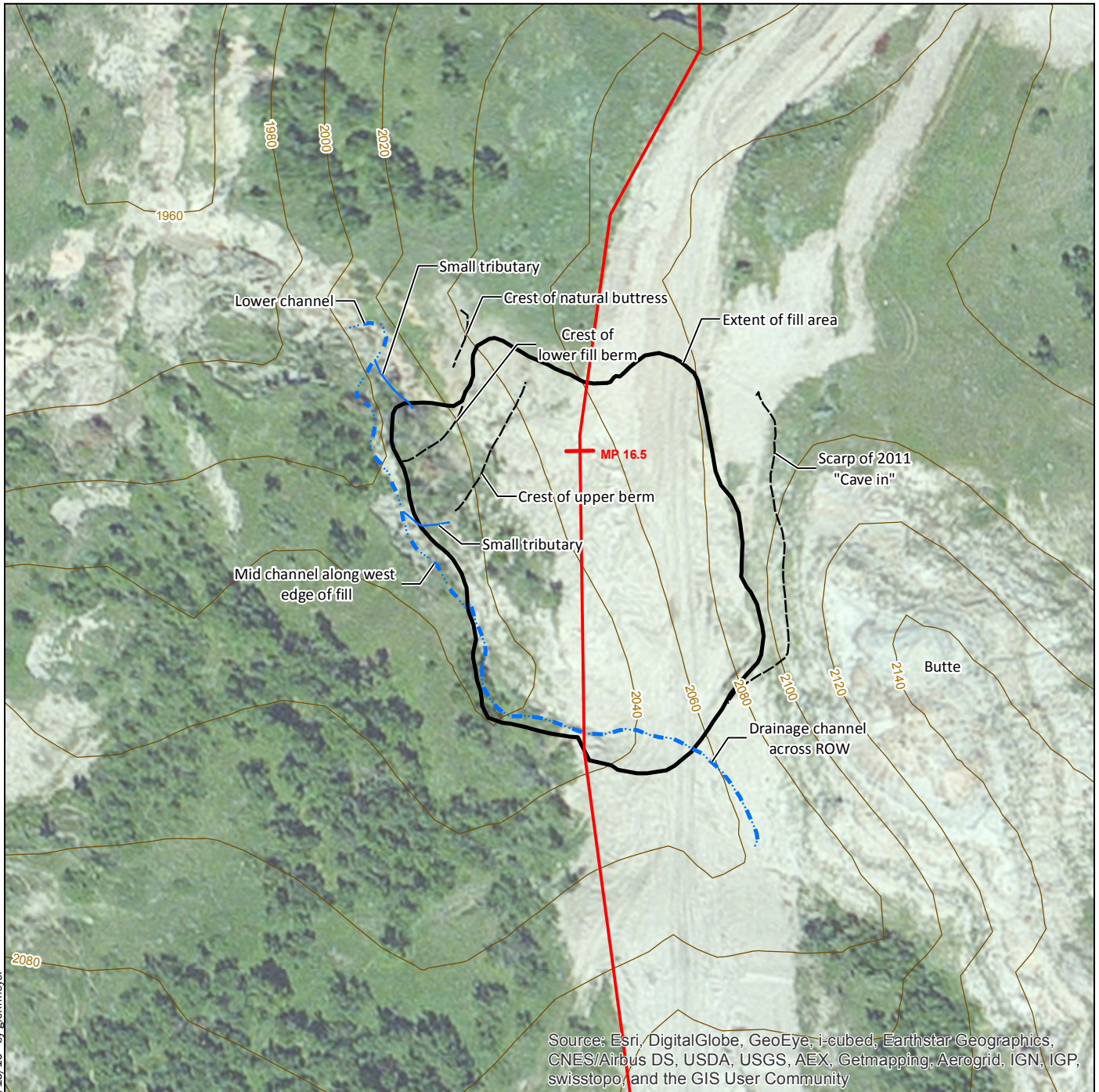
Data Source: ESRI, 2016

Projection: NAD 1983 UTM Zone 13N



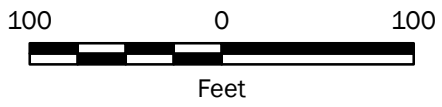
Figure 1

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Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- Proposed DAPL Route
- ~ 20 Foot Contour (predate fill construction)



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from ESRI
 Projection: NAD 1983 UTM Zone 13N

Site Plan	
Drainage Feature MP 16.5 Proposed DAPL Main Line Dunn County, North Dakota	
	Figure 2

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Photograph 1. Vantage of regraded fill area along existing Bridger Four Bears pipeline. View to north.



Photograph 2. Scarp of 2011 "cave-in" event, with bedrock butte on photo left. View to south.

Site Photographs

Drainage Feature MP 16.5, Proposed DAPL Main Line
Dunn County, North Dakota



Figure 3



Photograph 3. Vantage from lower stream drainage looking up at natural bedrock buttress (photo left) and bedrock butte (top of photo). View to east.



Photograph 4. View from lower buttress berm to lower stream drainage, with natural bedrock buttress on photo right. View to west.

Site Photographs

Drainage Feature MP 16.5, Proposed DAPL Main Line
Dunn County, North Dakota



Figure 4



Photograph 5. Upper berm area. View to north



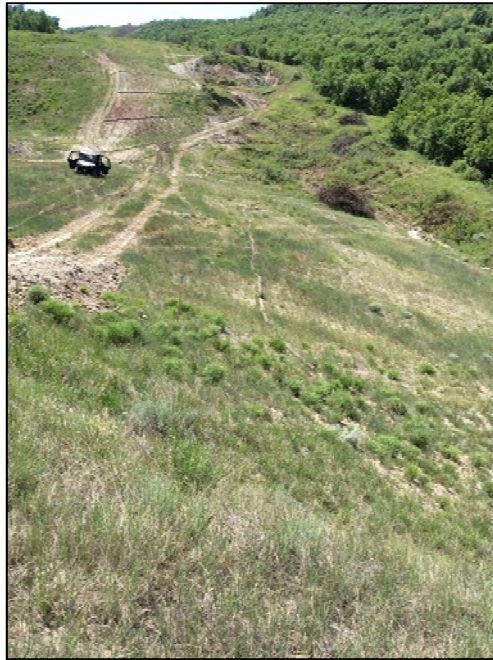
Photograph 6. Upper berm area (photo right) and lower berm (photo left). View to north.

Site Photographs

Drainage Feature MP 16.5, Proposed DAPL Main Line
Dunn County, North Dakota



Figure 5



Photograph 7. View across regraded fill area along proposed DAPL centerline (marked by stakes). View to south.



Photograph 8. Incising stream channel across eastern edge of ROW fill. View to northwest.

Site Photographs

Drainage Feature MP 16.5, Proposed DAPL Main Line
Dunn County, North Dakota



Figure 6



Photograph 9. Headward-migrating nickpoint in incised stream channel on western edge of ROW fill. View to southeast.



Photograph 10. Incising stream channel in vicinity of Four Bears line. View to northwest.

Site Photographs

Drainage Feature MP 16.5, Proposed DAPL Main Line
Dunn County, North Dakota



Figure 7



Photograph 11. Incising channel along western margin of fill area. View to southeast.



Photograph 12. 12-foot-tall embankment along western margin of fill area. CMP drainpipe at bottom of photo. View to south.

Site Photographs

Drainage Feature MP 16.5, Proposed DAPL Main Line
Dunn County, North Dakota



Figure 8