

TC 1C

EXHIBIT C

2 SEPT 2006

VOL I

SD EXHIBIT
material
TC 1C Vol 1
2 Sept. 2006
12-3-07

CONFIDENTIAL

Proposed Survey Schedule For [South Dakota]

2006 Surveys					
Species & Status	Approximate Survey Dates	Specific Survey Areas (by County & MP)	Survey Description	Surveyor	Comments
<p>Dakota Skipper <i>Herperia dacotae</i></p> <p>FC; SD-SC</p>	<p>Late-Summer/Fall</p>	<p>Clark: 277.5 - 302.6. (Reroute from 276.5-286; Don Hazlet to conduct native grassland reconnaissance surveys along probable re-route for suitable Dakota skipper/western fringed orchid habitat)</p> <p>Day: 250.6 - 268.1. (Reroute from 257-270; Don Hazlet to conduct native grassland reconnaissance surveys along probable re-route for suitable Dakota skipper/western fringed orchid habitat)</p> <p>Marshall: 215.0 - 222.8. (Reroute from MP 215 - 223; Don Hazlet to conduct native grassland reconnaissance surveys along probable re-route for suitable Dakota skipper/western fringed orchid habitat)</p> <p>Yankton: 415.0 - 425.1.</p>	<p>Habitat evaluations will be conducted within the construction ROW to determine potential habitat for this species.</p>	<p>Qualified ENSR biologist and/or contractor.</p>	<p>Survey areas will be refined based on habitat surveys.</p>
<p>Topeka shiner <i>Notropis Topeka</i></p> <p>FE; SD-SC</p>	<p>Late-Summer/Fall</p>	<p>Beadle: 305.7, 307.4, 308.0, 309.4, 310.1, 311.4 (Shue Creek), 311.9 (Pearl Creek), 314.0, 314.9, 315.8, 316.6 (Middle Fork Pearl Creek). Clark: 294.3, 295.3 (Clark Creek), Tributaries to Pearl, Middle Pearl, Shue, and Badwater creeks in SW Clark</p>	<p>Habitat surveys will be conducted to document habitat suitability; intermittent/perennial flow; and grazing</p>	<p>Topeka shiner expert and ENSR biologist.</p>	<p>See attached survey protocol.</p>

CONFIDENTIAL

		<p>Miner: 339.4 (Redstone Creek), 357.7, 358.4, 358.6 (Rock Creek).</p> <p>Yankton: 417.9-418.0 (James River), 431.9-432.3 (Missouri River).</p>			
<p>Higgins'-eye pearly mussel <i>Lampsilis higginsii</i></p> <p>Scaleshell mussel <i>Leptodea leptodon</i></p> <p>Winged mapleleaf <i>Quadrula gragosa</i> FE; SD-SC</p>	Late-Summer/Fall	<p>Yankton: 417.9-418.0 (James River).</p>	Habitat and occurrence surveys will be conducted to determine potential presence at the James River crossing.	Qualified ENSR biologist and/or contractor.	If sensitive mussels are identified within the project vicinity, ENSR will coordinate with the USFWS.
2007 Surveys					
Species & Status	Approximate Survey Dates	Specific Survey Areas (by County & MP)	Survey Description	Surveyor	Comments
<p>Dakota Skipper <i>Herperia dacotae</i></p> <p>FC; SD-SC</p>	Emergence: mid-June to 1-Aug. Peak – 1 st week of July.	<p>Clark: 277.5 - 302.6. (Reroute from 276.5-286)</p> <p>Day: 250.6 - 268.1. (Reroute from 257-270)</p> <p>Marshall: 215.0 - 222.8. (Reroute from MP 215 – 223)</p> <p>Yankton: 415.0 - 425.1.</p> <p>(Survey areas will be refined based on the 2006 habitat surveys)</p>	One survey will be conducted during the appropriate survey period to determine presence within the construction ROW.	Qualified ENSR biologist and/or contractor.	<p>See attached survey protocol.</p> <p>(2008 pre-construction surveys would only be required in areas where this species was observed in 2007)</p>
<p>Topeka shiner <i>Notropis Topeka</i></p> <p>FE; SD-SC</p>	Late-Summer/Fall	<p>Beadle: 305.7, 307.4, 308.0, 309.4, 310.1, 311.4 (Shue Creek), 311.9 (Pearl Creek), 314.0, 314.9, 315.8, 316.6 (Middle Fork Pearl Creek).</p> <p>Clark: 294.3, 295.3 (Clark</p>	One sampling survey to determine species presence at stream	Topeka shiner expert and ENSR biologist.	See attached survey protocol.

CONFIDENTIAL

		(South Fork Pearl Creek). McCook: 380.3, 380.5, 380.8 (Wolf Creek). Miner: 339.4 (Redstone Creek), 357.7, 358.4, 358.6 (Rock Creek). Yankton: 417.9-418.0 (James River), 431.9-432.3 (Missouri River).			
Western Fringed Orchid <i>Platanthera praeclara</i> FT; SD-SC	Flowering period: 15-June to 15-July.	Clark: 277.5 - 302.6. (Reroute from 276.5-286) Day: 250.6 - 268.1. (Reroute from 257-270) Marshall: 215.0 - 222.8. (Reroute from MP 215 - 223) Yankton: 415.0 - 425.1. (Survey areas will be the same as determined for the Dakota skipper)	One survey will be conducted during the flowering period to determine presence within the construction ROW.	Qualified ENSR biologist and/or contractor	See attached survey protocol. (2008 pre-construction surveys would only be required in areas where this species was observed in 2007)

2008 Surveys (Pre-construction)					
Species & Status	Approximate Survey Dates	Specific Survey Areas (by County & MP)	Survey Description	Surveyor	Comments
Bald eagle <i>Haliaeetus leucocephalus</i> FT; SD-T	Nesting period: 1-Feb to 15-Aug. Winter roosting period: 1-Nov. to 1-April.	Yankton: 417.9-418.0, 431.9-432.3 (James River, Missouri River).	One ground survey or aerial survey prior to construction. Survey will be conducted 1-mile from the construction ROW.	Qualified ENSR biologist and/or contractor.	This survey will not be required if construction occurs outside of the breeding/winter roost seasons for this species. See attached survey protocol.
Interior Least Tern <i>Sterna antillarum athalassos</i>	Nesting period: 15-April to 15-Sept.	Yankton: 431.9-432.3 (Missouri River).	One ground survey or aerial survey prior to construction. Survey will be	Qualified ENSR biologist and/or contractor.	This survey will not be required if construction occurs outside of the breeding

CONFIDENTIAL

<p>Dakota Skipper <i>Herperia dacotae</i></p> <p>FC; SD-SC</p>	<p>Emergence: mid-June to 1-Aug. Peak – 1st week of July.</p>	<p>Clark: 277.5 - 302.6. (Reroute from 276.5-286) Day: 250.6 - 268.1. (Reroute from 257-270) Marshall: 215.0 - 222.8. (Reroute from MP 215 – 223) Yankton: 415.0 - 425.1.</p> <p><i>(Surveys will only occur in areas where this species was observed in 2007, prior to construction)</i></p>	<p>One survey will be conducted during the appropriate survey period to determine presence within the construction ROW.</p>	<p>Qualified ENSR biologist and/or contractor.</p>	<p>See attached survey protocol.</p>
<p>Topeka shiner <i>Notropis Topeka</i></p> <p>FE; SD-SC</p>	<p>Spawning Season: 15-May to 31-July</p>	<p>Beadle: 305.7, 307.4, 308.0, 309.4, 310.1, 311.4 (Shue Creek), 311.9 (Pearl Creek), 314.0, 314.9, 315.8, 316.6 (Middle Fork Pearl Creek). Clark: 294.3, 295.3 (Clark Creek), Tributaries to Pearl, Middle Pearl, Shue, and Redstone creeks in SW Clark Co. [300.4, 300.5, 301.4, 301.9, 302.5]. Hanson: 371.9, 373.9 (Wolf Creek). Hutchinson: 387.2, 387.6 (Wolf Creek). Kingsbury: 322.2, 322.4 (South Fork Pearl Creek). McCook: 380.3, 380.5, 380.8 (Wolf Creek). Miner: 339.4 (Redstone Creek), 357.7, 358.4, 358.6 (Rock Creek). Yankton: 417.9-418.0 (James River), 431.9-432.3 (Missouri River).</p>	<p>One sampling survey to determine species presence at stream crossings, if needed.</p>	<p>Topeka shiner expert and ENSR biologist.</p>	<p>If stream section is dry, no surveys would be required. If stream is wet, consult with state and federal agencies.</p> <p>Construction would not be permitted during the spawning period (May 15 to July 31) if the crossing is wet.</p> <p>Obtain necessary permits from the state and federal agencies if salvage and relocation is conducted prior to construction.</p>
<p>Western Fringed Orchid <i>Platanthera</i></p>	<p>Flowering period: 15-June to 15-July.</p>	<p>Clark: 277.5 - 302.6. (Reroute from 276.5-286) Day: 250.6 - 268.1. (Reroute from 257-270)</p>	<p>One survey will be conducted during the flowering period</p>	<p>Qualified ENSR biologist and/or contractor</p>	<p>See attached survey protocol.</p>

CONFIDENTIAL

Migratory Birds (including raptors)	TBD based on John Cochran's correspondence with USEFS meeting with USEFS Special Agents and MBTA Office.	TBD	TBD	TBD	TBD
---	---	-----	-----	-----	-----



CONFIDENTIAL

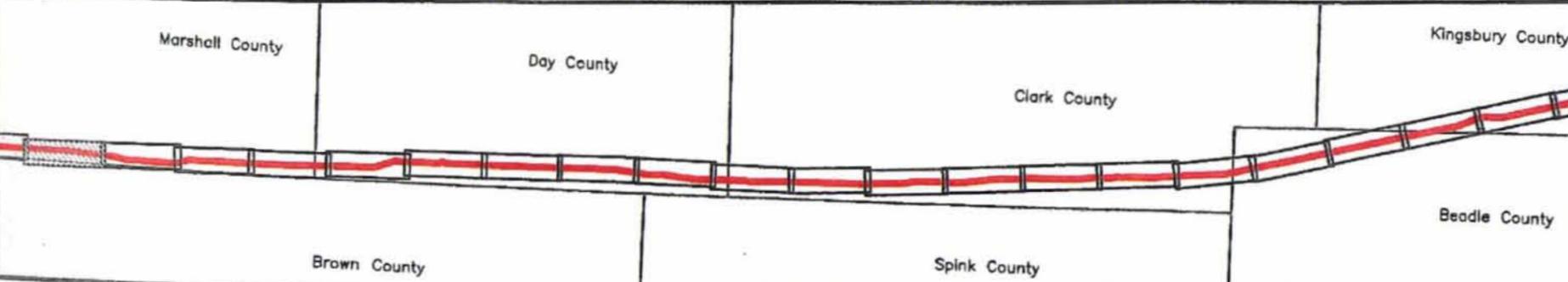
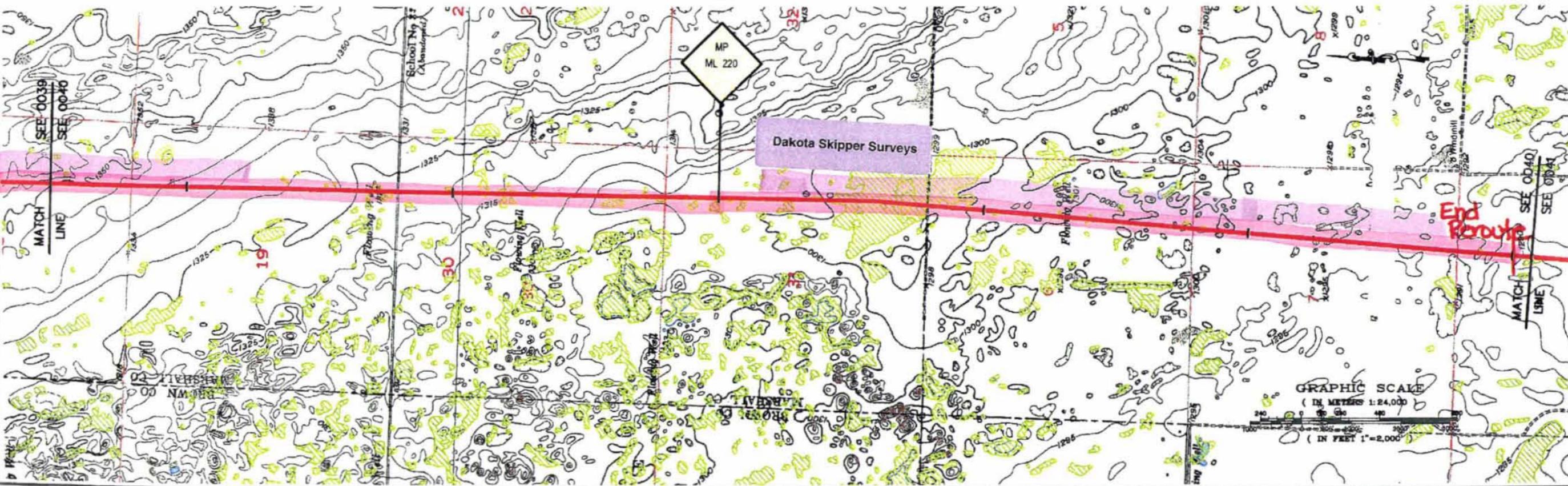
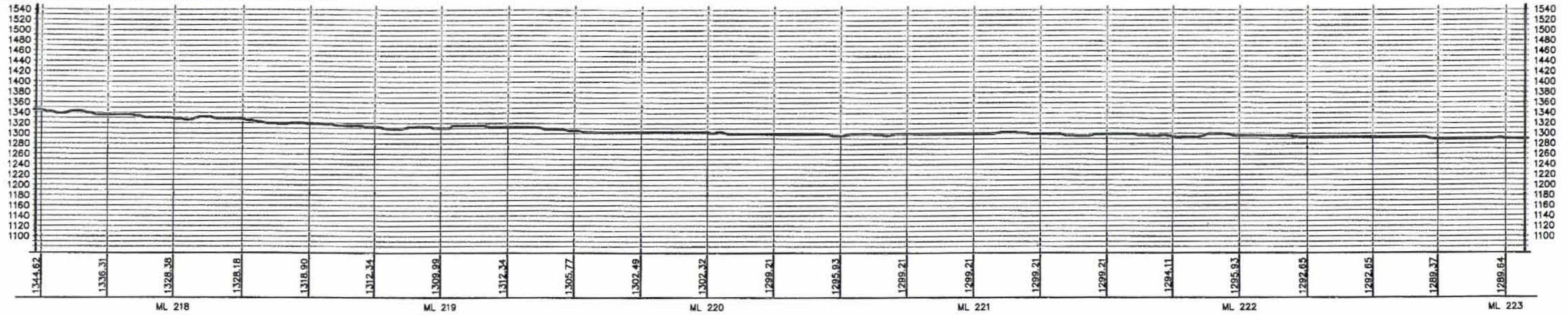
Table 1
South Dakota Special Status Species
Habitat by County and Mainline Milepost
Keystone Pipeline Project

Species	Status	Suggested Survey Period	Survey Frequency	Survey Protocol Summary	Survey Counties	Miles (mi) of Associated Habitat Crossed by Keystone Pipeline Project					Mainline Milepost(s)
						Grassland (mi)	Forests and Woodlands (mi)	Riparian (mi)	Nonforested Emergent Wetland (mi) ¹	Open Water (mi) (habitat crossed or within 0.5 mi)	
Bald eagle <i>Haliaeetus leucocephalus</i>	FT; SD-T	Nesting sites: 1-Feb to 15-Aug. Winter roost sites: 1-Nov. to 1-April	Conduct breeding and winter roost surveys if construction occurs during the breeding season/ winter roost season along river corridors only	One-mile upstream and one-mile downstream of suitable habitat crossed by project	Yankton					Yankton: 0.5 (James River, Missouri River)	Yankton: 417.9 - 418.0 (James River), 431.9-432.3 (Missouri River)
Interior least tern <i>Sterna antillarum athalassos</i>	FE; SD-E	Nesting Season: 15-April to 15-Sept.	One ground survey prior to any constr. If constr. takes place during the breeding season	Missouri River only	Yankton					Yankton: 0.4 (Missouri River)	Yankton: 431.9-432.3 (Missouri River)
Piping plover <i>Charadrius melodus</i>	FT; SD-T	Nesting Season: 15-April to 15-Sept.	One ground survey prior to any constr. If constr. takes place during the breeding season	Missouri River only	Yankton (Missouri River between Yankton County, South Dakota and Cedar County, Nebraska is designated as critical habitat by USFWS)					Yankton: 0.4 (Missouri River)	Yankton: 431.9-432.3 (Missouri River)
Topeka shiner <i>Notropis topeka</i>	FE; SD-SC	Spawning Season: 15-May to 31-July	Possibly one survey prior to construction (Depnding on crossing method and time of year)	SDGFP: "Ok with cutting stream channels if they are dry. If the channels are running or if pools of water occur at the pipeline crossings, the SDGFP recommends that further habitat analysis occur to determine if the channel could be open cut, or if it should be drilled."	Beadle Clark Clark Hanson Hutchinson Kingsbury McCook Miner Yankton					Beadle: 0.1 (Shue Creek, Middle Fork Pearl Creek) Clark: 0.1 (Foster Creek, Various Tributaries) Hanson: 0.1 (Wolf Creek) Hutchinson: 0.1 (Wolf Creek) Kingsbury: 0.1 (South Fork Pearl Creek) McCook: 0.1 (Wolf Creek) Miner: 0.2 (Restone Creek, Rock Creek) Yankton: 0.3 (James River, Missouri River)	Beadle: 305.7, 307.4, 308.0, 309.4, 310.1, 311.4 (Shue Creek), 311.9 (Pearl Creek), 314.0, 314.9, 315.8, 316.6 (Middle Fork Pearl Creek) Clark: 294.3, 295.3 (Clark Creek), 300.4, 300.5, 301.4, 301.9, 302.5 (intermittent tributaries to Pearl, Middle Pearl, Shue, and Redstone creeks in SW Clark County) Hanson: 371.9, 373.9 (Wolf Creek) Hutchinson: 387.2, 387.6 (Wolf Creek) Kingsbury: 322.2, 322.4 (South Fork Pearl Creek) McCook: 380.3, 380.5, 380.8 (Wolf Creek) Miner: 339.4 (Redstone Creek), 357.7, 358.4, 358.6 (Rock Creek) Yankton: 417.9-418.0 (James River), 431.9-432.3 (Missouri River)
Dakota skipper <i>Hesperia dacotae</i>	FC; SD-SC	Flying Period: mid-June to August 1 Peak: 1st week of July	Survey prior to construction	Suitable native prairie within 100 meters of ROW. Adults must be surveyed for in a short time frame. Adults only fly for 1-2 weeks, usually peaking in the first week of July	Clark Day Marshall Yankton	Clark: 4.5 Day: 6.7 Marshall: 5.1 Yankton: 2.1					Clark: 277.5 - 302.6 Day: 250.6 - 268.1 Marshall: 215.0 - 222.8 Yankton: 415.0 - 425.1
Mussels <i>various species</i>		Late July	One survey prior to construction	Suggest survey of the James River crossing for mussel beds. It is possible that the crossing site could harbor a significant mussel bed that might include rare species, if not T&E species	Yankton					Yankton: 0.1 (James River)	Yankton: 417.9-418.0 (James River)
Western prairie fringed orchid <i>Platanthera praecleara</i>	FT; SD-SC	Flowering Period: 15-June to 15-July	One ground survey prior to construction	Results of survey should be submitted to the State Service Field Office to determine if further section 7 consultation is necessary	Clark Day Yankton	Clark: 4.5 Day: 6.7 Yankton: 2.1			<i>data pending</i> <i>data pending</i> <i>data pending</i>		Clark: 277.5 - 302.6; <i>data pending</i> Day: 250.6 - 268.1; <i>data pending</i> Yankton: 415.0 - 425.1; <i>data pending</i>

¹ Data pending; waiting on completion of wetland/waterbody surveys to determine total wetland habitat crossed by project.

CONFIDENTIAL

ELEVATIONS SHOWN IN FEET - VERTICAL=10x HORIZONTAL SCALE



PREPARED BY:
TROW ENGINEERING CONSULTANTS, INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida 32306
 Phone: 1-850-385-5441
 Fax: 1-850-385-5523

NO.	REVISION	DATE

ISSUED FOR DEPARTMENT OF STATE FILING MAR. 13.06

DRAWING NUMBER	DRAWN BY	CHECKED BY	APPROVED BY
K-46-P-900-A-0001	BEK	BLS	RG

TransCanada
In business to deliver

**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

MAP PARAMETERS
 PROJECTION: NAD83, UTM: 14N
 SCALE: 1:24,000; 1" = 2,000'

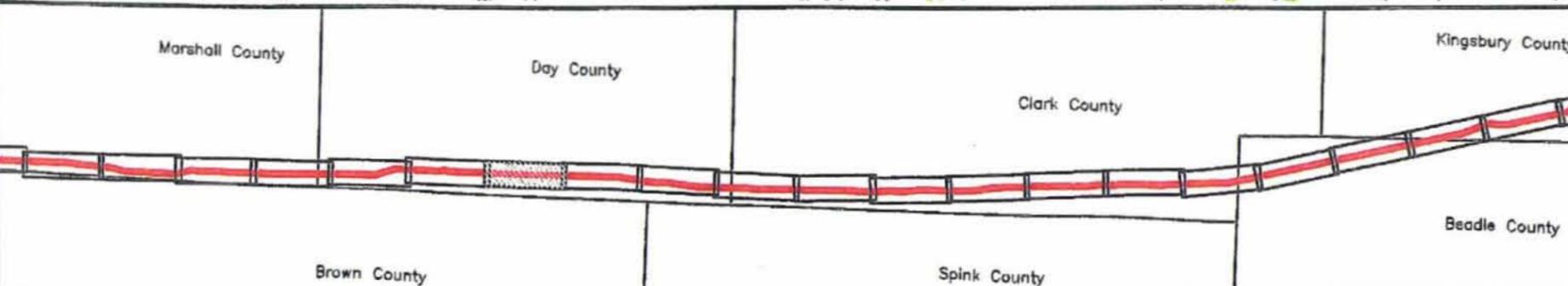
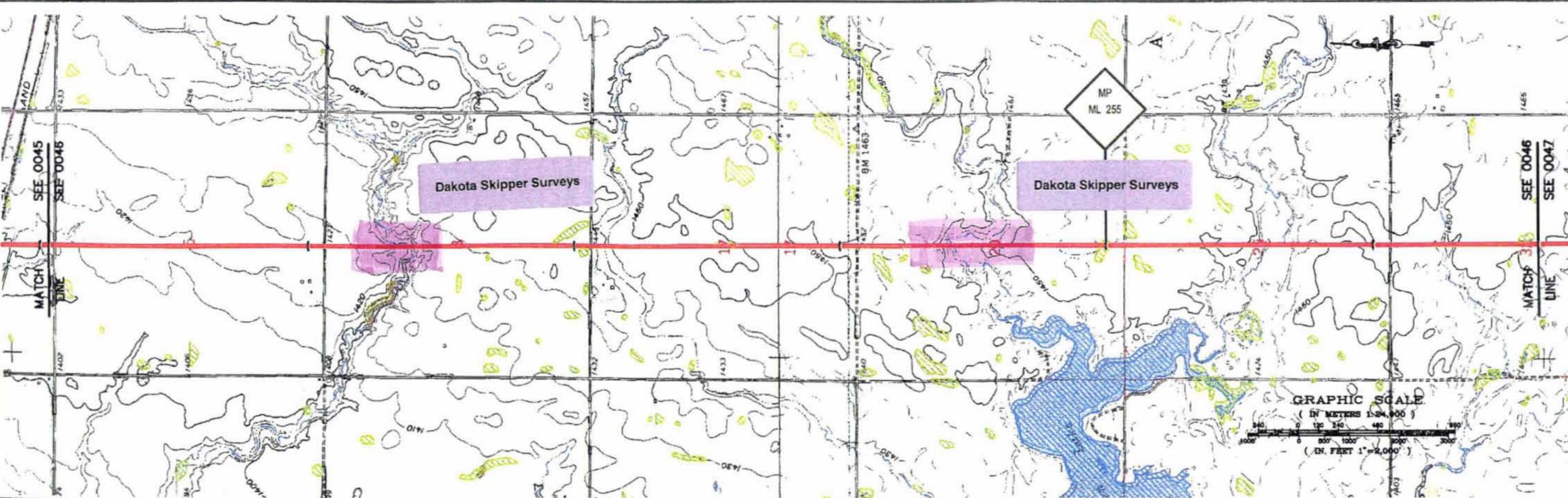
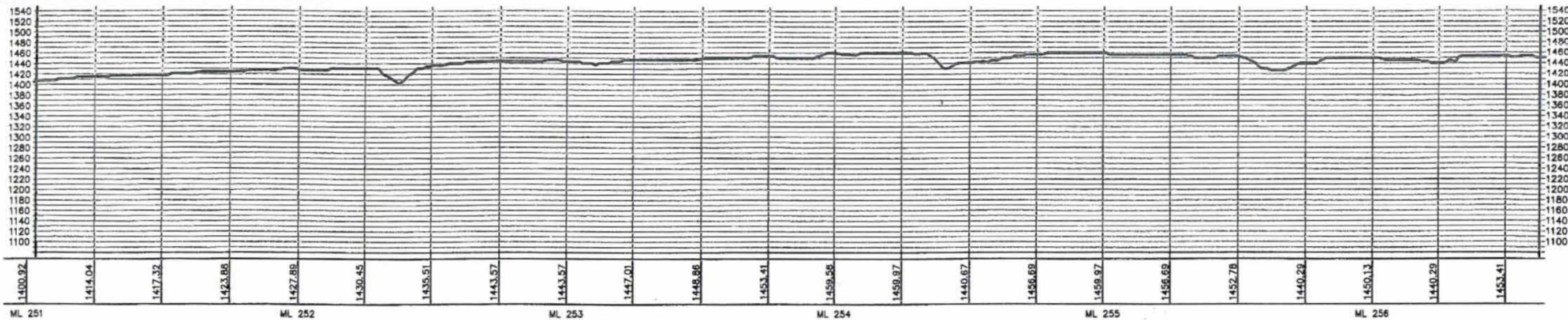
PROJECT: 50388E
 SHEET: **0040**

LAST PLOT DATE: Mar. 07 Mar 2006 - 8:51am

K:\Projects\46-900-A-0001\46-900-A-0001-0040.dwg 3/7/2006 8:51:05 PM EST
 K:\Projects\46-900-A-0001\46-900-A-0001-0040.dwg 3/7/2006 8:51:05 PM EST

CONFIDENTIAL

ELEVATIONS SHOWN IN FEET - VERTICAL=10x HORIZONTAL SCALE



PREPARED BY:
TROW ENGINEERING CONSULTANTS, INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida 32306
 Phone: 1-850-385-5441
 Fax: 1-850-385-5523

TransCanada
In business to deliver

**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

MAP PARAMETERS
 PROJECTION: NAD83, UTM: 14N
 SCALE: 1:24,000; 1" = 2,000'

NO.	REVISION	DATE

PROJECT: 50388E SHEET: 0046

ISSUED FOR DEPARTMENT OF STATE PLING MAR.13.06

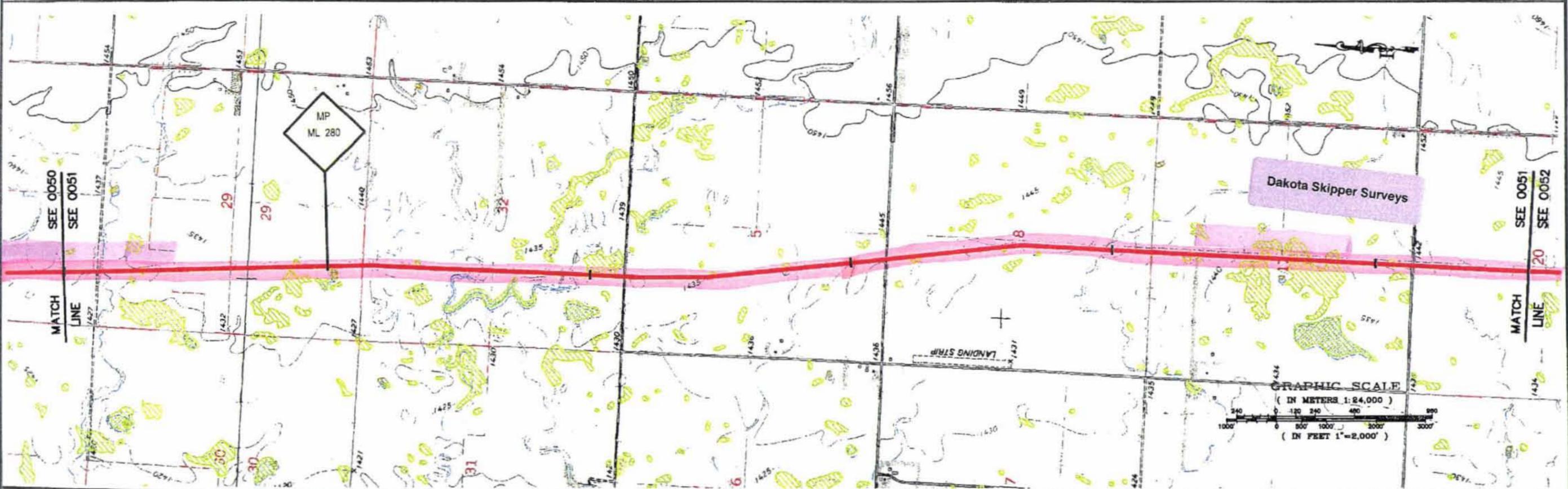
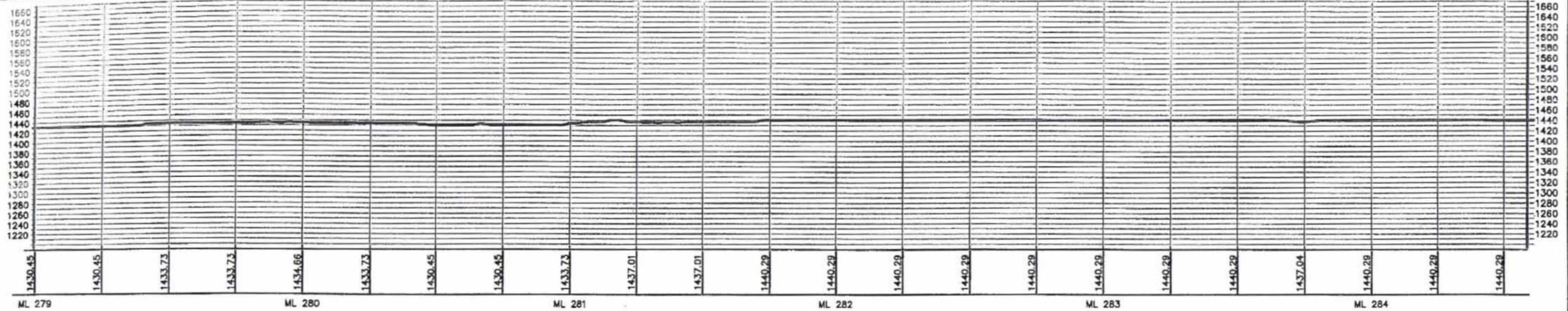
DRAWING NUMBER DRAWN BY CHECKED BY APPROVED BY

LAST PLOT DATE:

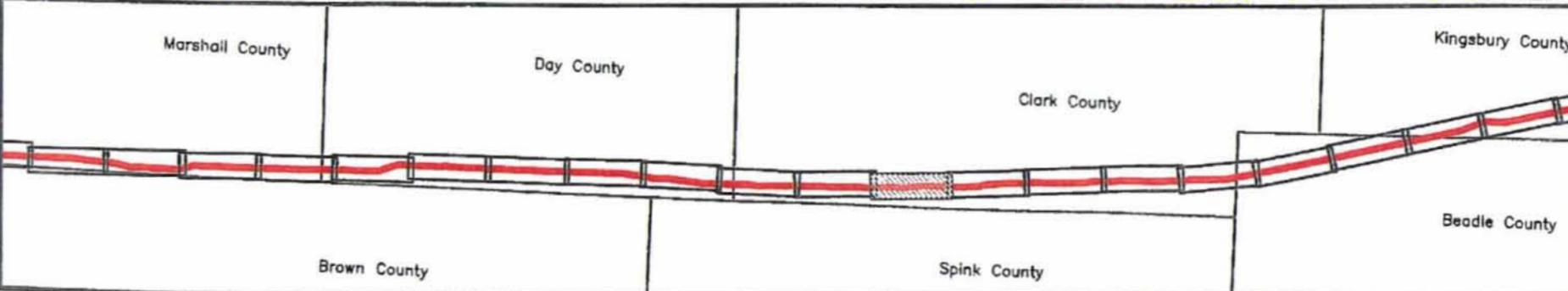
K:\Users\jg\My Documents\Projects\Keystone\Map\0046\0046.dwg 3/7/2006 6:31:16 PM



ELEVATIONS SHOWN IN FEET - VERTICAL=10x HORIZONTAL SCALE



K:\Drawings\50388A\KEYSTONE\PIPELINE\PROPOSED_ROUTE_BOOK\50388A-0012.dwg 3/7/2008 8:10:38 PM DT



PREPARED BY:
TROW ENGINEERING CONSULTANTS, INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida 32308
 Phone: 1-850-385-6441
 Fax: 1-850-385-6523

Trow

NO.	REVISION	DATE

ISSUED FOR DEPARTMENT OF STATE FILING MAR.13.08

DRAWING NUMBER	DRAWN BY	CHECKED BY	APPROVED BY
K-46-P-800-A-0012	BEK	BLS	RG

TransCanada
in business to deliver

**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

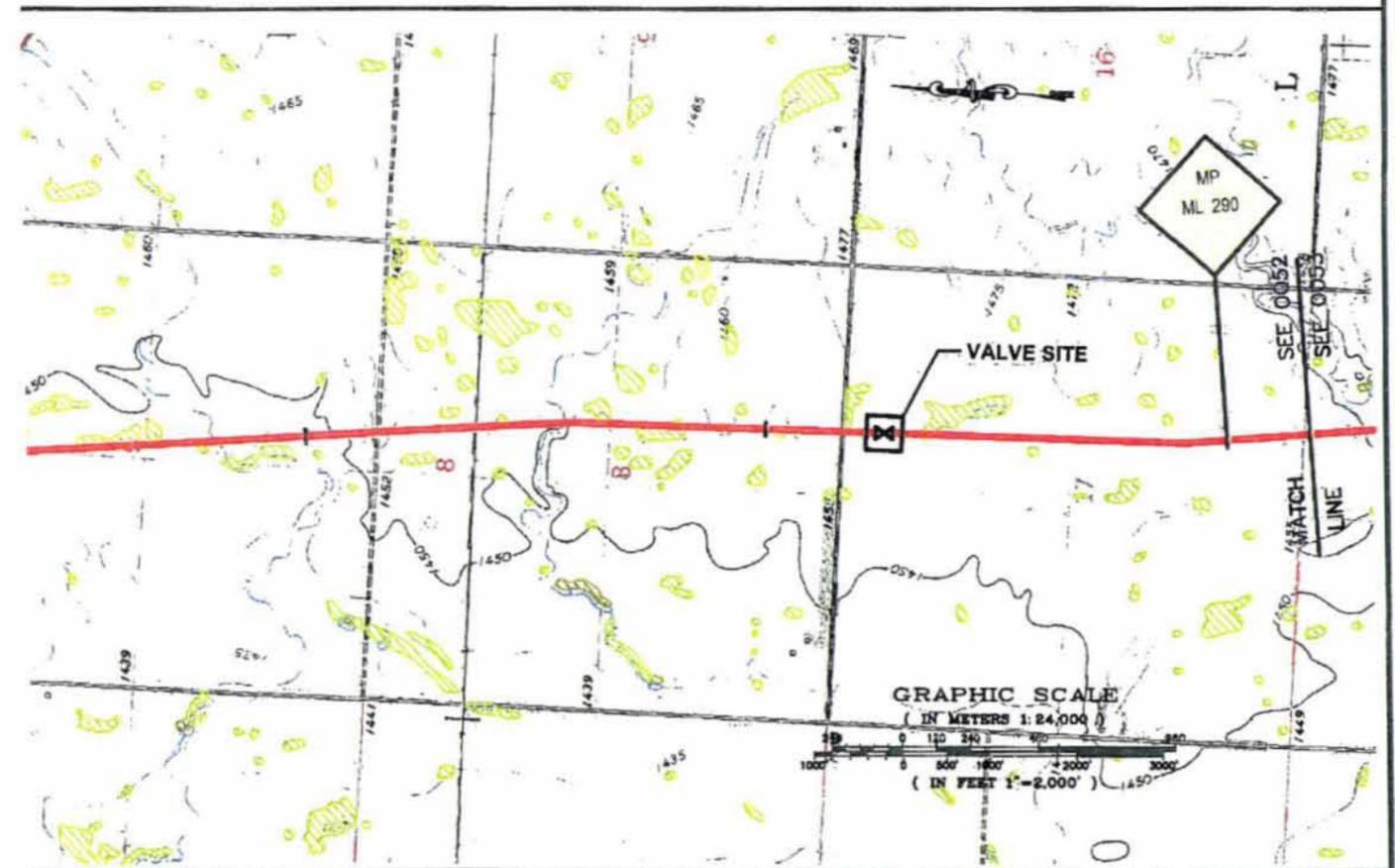
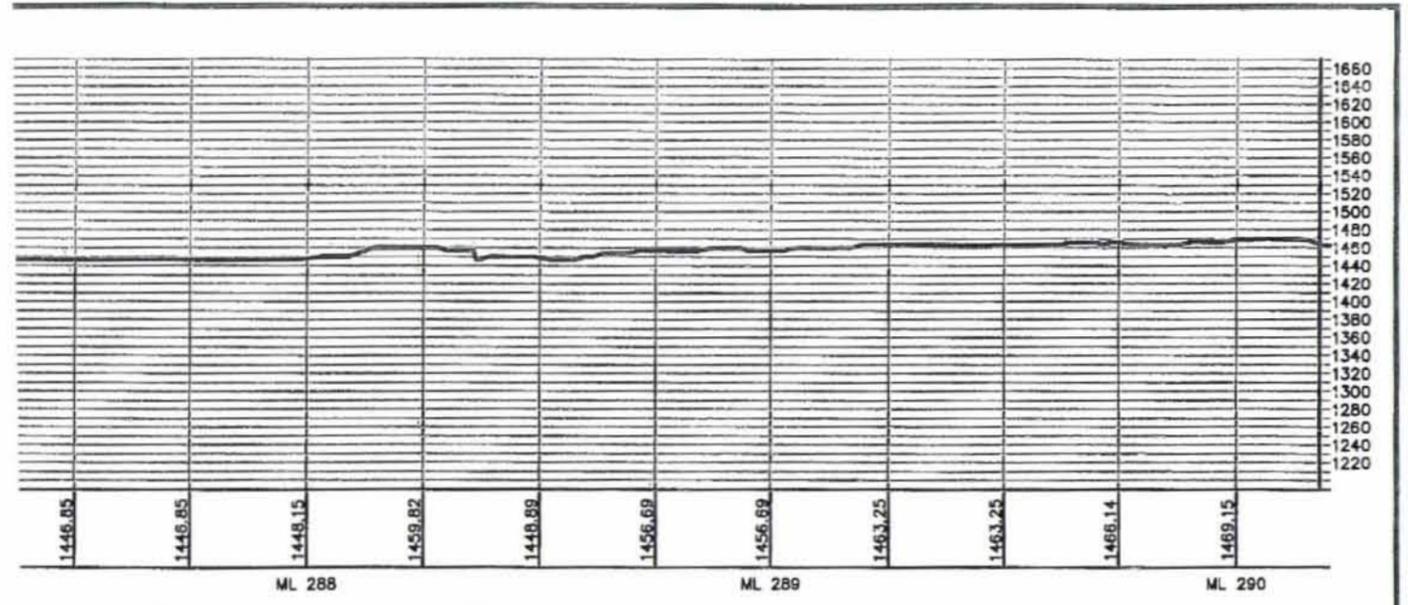
MAP PARAMETERS
 PROJECTION: NAD83, UTM: 14N
 SCALE: 1:24,000; 1" = 2,000'

PROJECT:	SHEET:
50388E	0051

LAST PLOT DATE:
 Tue, 07 Mar 2008 - 7:31pm

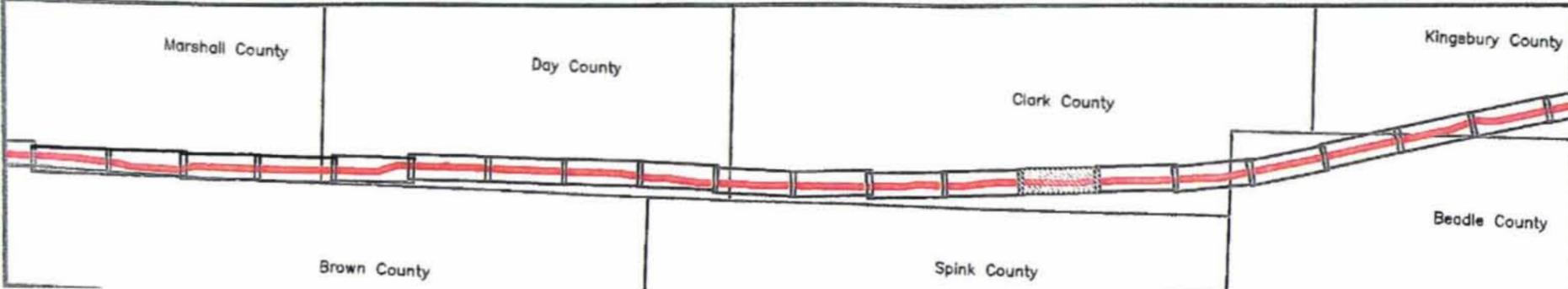
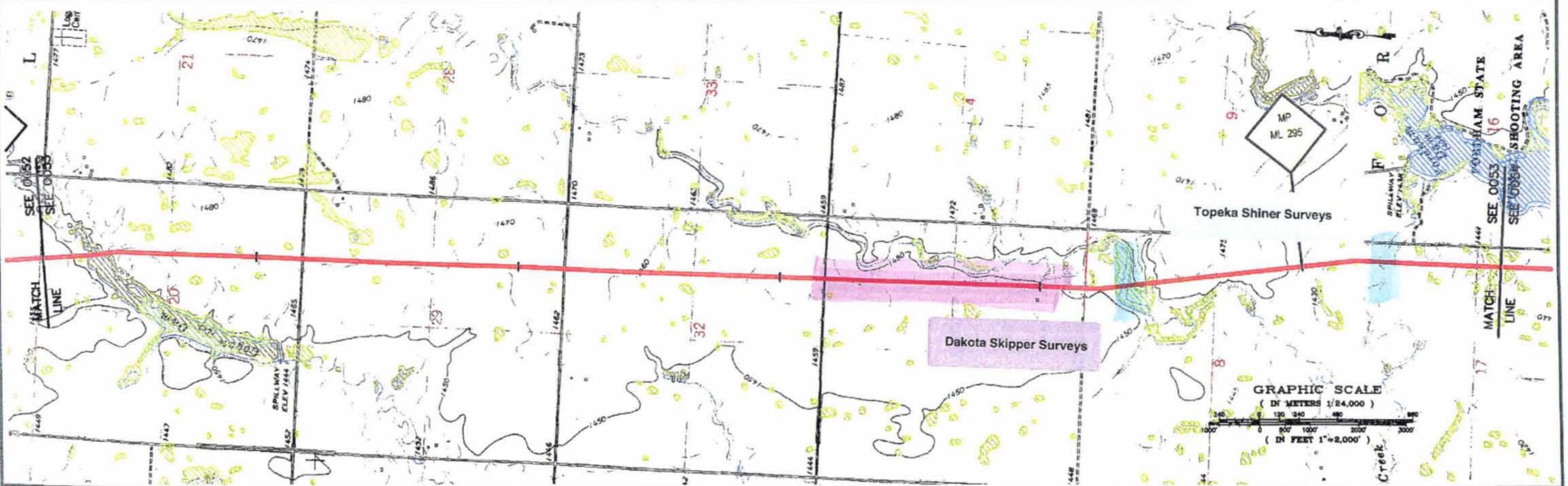
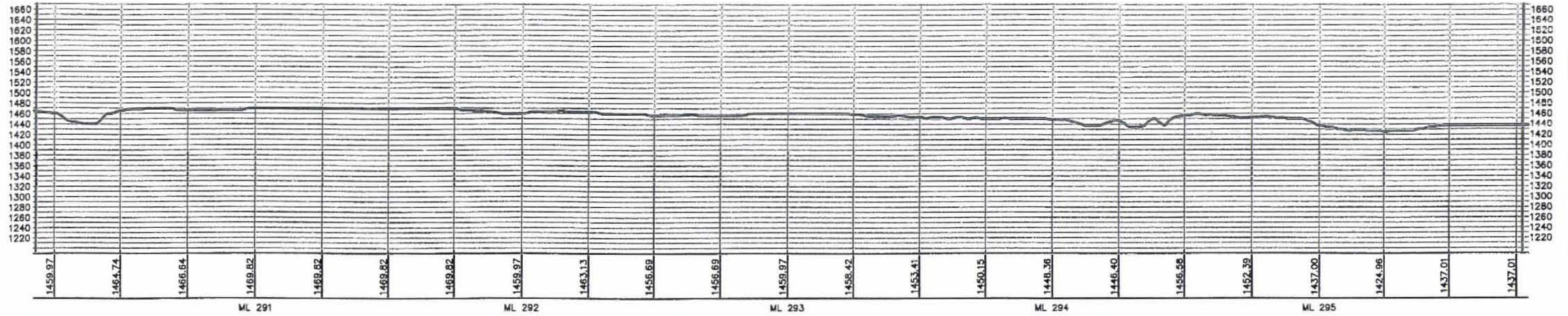
ENTIAL

Handwritten notes: "D", "R", "B", "A", "R", "R", "I" written vertically in large, stylized letters.



Kingsbury County Beadle County	PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-5441 Fax: 1-850-385-5523	 Trow	 TransCanada <i>In business to deliver</i>
	KEYSTONE PIPELINE PROJECT PROPOSED ROUTE BOOK		MAP PARAMETERS PROJECTION: NAD83, UTM: 14N SCALE: 1:24,000; 1" = 2,000'
PROJECT: ISSUED FOR DEPARTMENT OF STATE FILING DATE: MAR 13, 08		PROJECT: 50388E SHEET: 0052	PROJECT: 50388E SHEET: 0052
DRAWING NUMBER: K-46-P-900-A-0013 DRAWN BY: BEK CHECKED BY: BLS APPROVED BY: RG		LAST PLOT DATE:	

ELEVATIONS SHOWN IN FEET - VERTICAL=10x HORIZONTAL SCALE

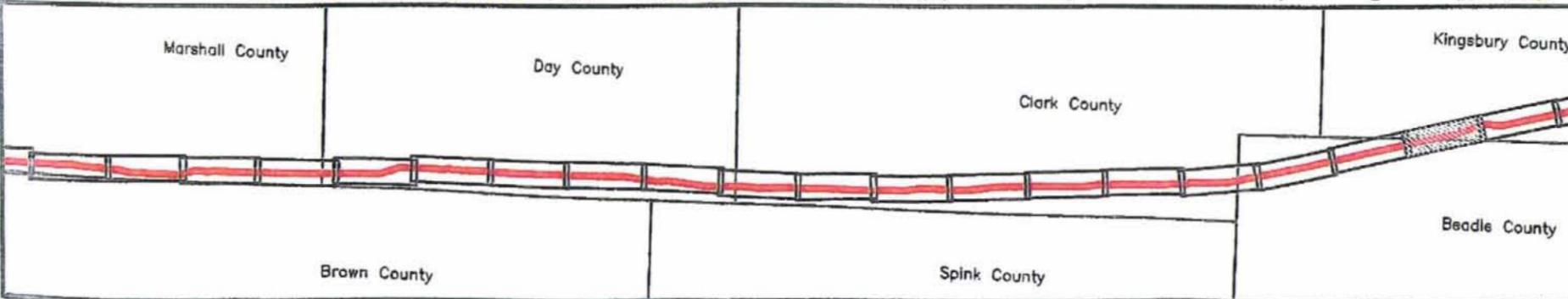
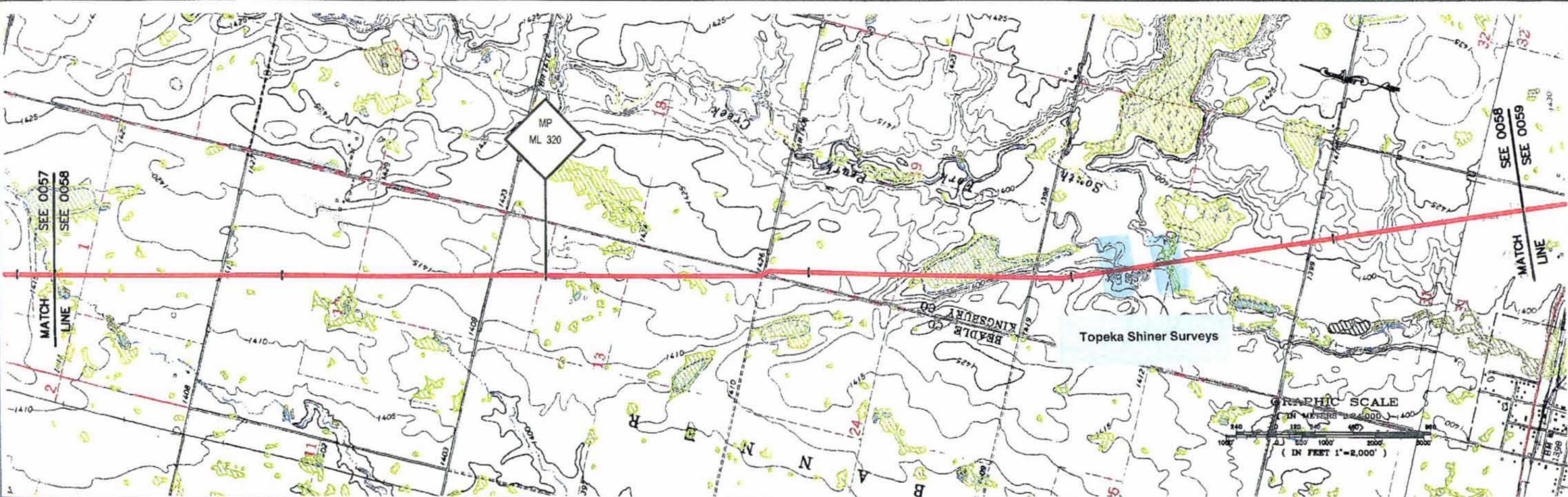
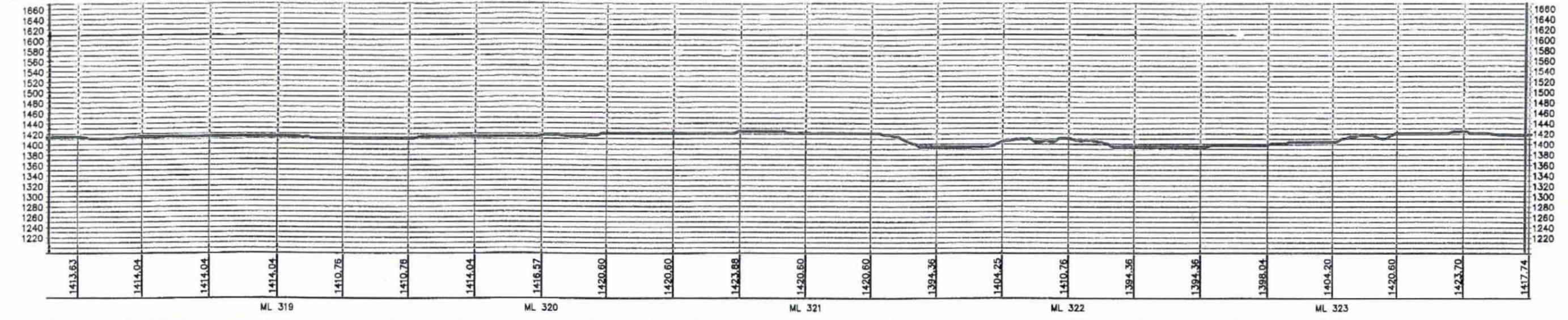


PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-5441 Fax: 1-850-385-5523				
NO. REVISION DATE			KEYSTONE PIPELINE PROJECT PROPOSED ROUTE BOOK	
ISSUED FOR DEPARTMENT OF STATE FILING MAR. 13, 06			PROJECT: 50388E	
DRAWING NUMBER K-46-P-900-A-0014	DRAWN BY BEK	CHECKED BY BLS	APPROVED BY RG	SHEET: 0053
LAST PLOT DATE: Tue, 07 Mar 2006 - 7:21pm				

I:\Projects\050503\050503.dwg 05/03/06 10:00:00 AM 1459.97-1437.01 1:24,000 3/7/2006 5:29:25 PM CBT



ELEVATIONS SHOWN IN FEET - VERTICAL=10x HORIZONTAL SCALE



PREPARED BY:
TROW ENGINEERING CONSULTANTS, INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida 32308
 Phone: 1-850-385-8441
 Fax: 1-850-385-5523

TransCanada
In business to deliver

**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

MAP PARAMETERS
 PROJECTION: NAD83, UTM: 14N
 SCALE: 1:24,000; 1" = 2,000'

PROJECT: 50388E
 SHEET: 0058

ISSUED FOR DEPARTMENT OF STATE PLING MAR.13.06

NO.	REVISION	DATE

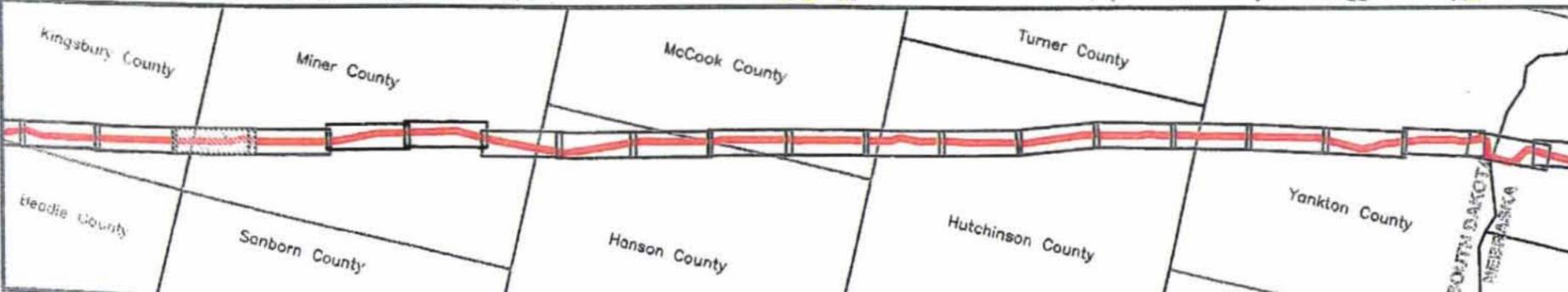
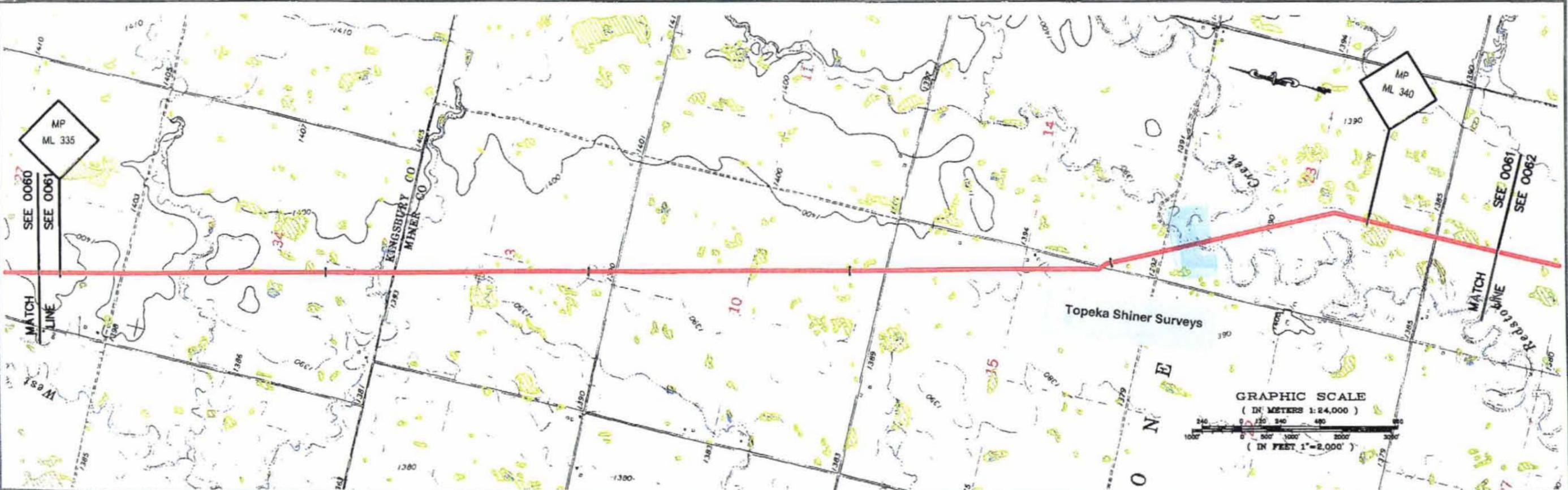
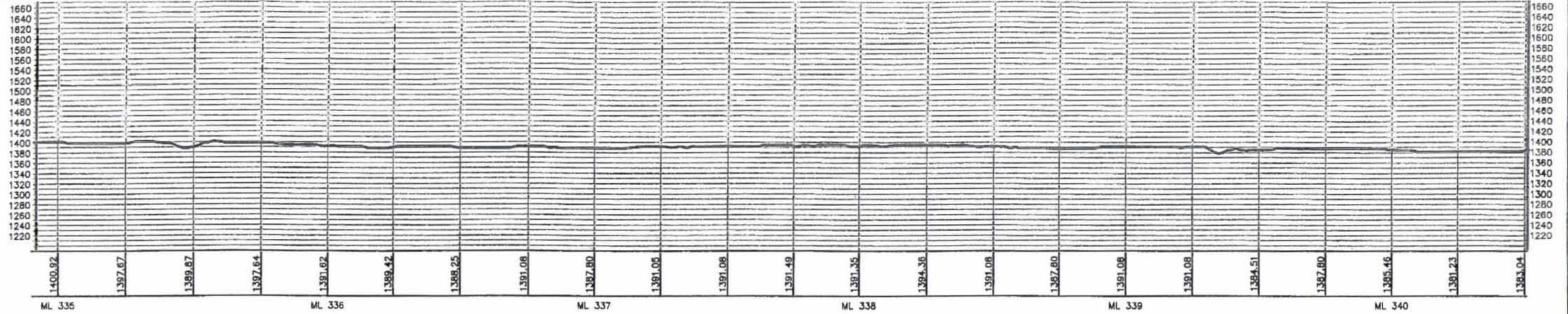
DRAWING NUMBER	DRAWN BY	CHECKED BY	APPROVED BY
K-46-P-900-A-0019	AH	BLS	RG

LAST PLOT DATE:
 Tue, 07 Mar 2006 - 10:24pm

K:\Drawings\040000\KEYSTONE\PROPOSED ROUTE BOOK\0058\0058.dwg 3/7/2006 8:15:04 PM EST

CONFIDENTIAL

ELEVATIONS SHOWN IN FEET - VERTICAL = 10x HORIZONTAL SCALE

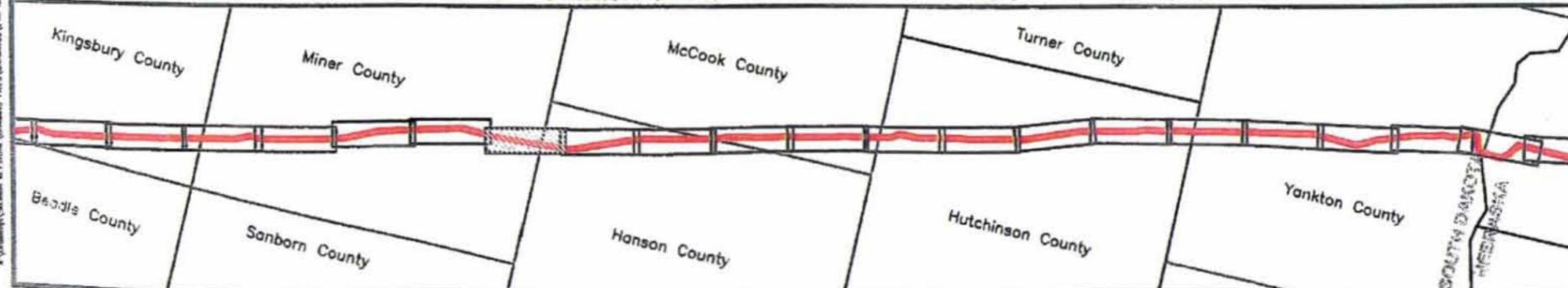
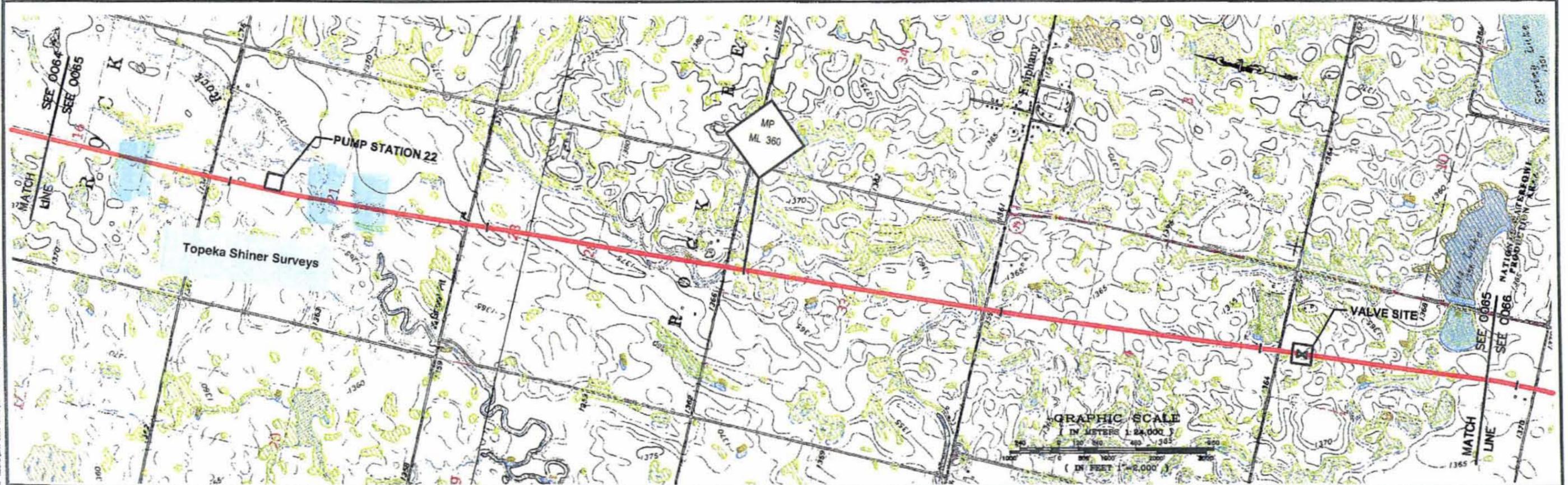
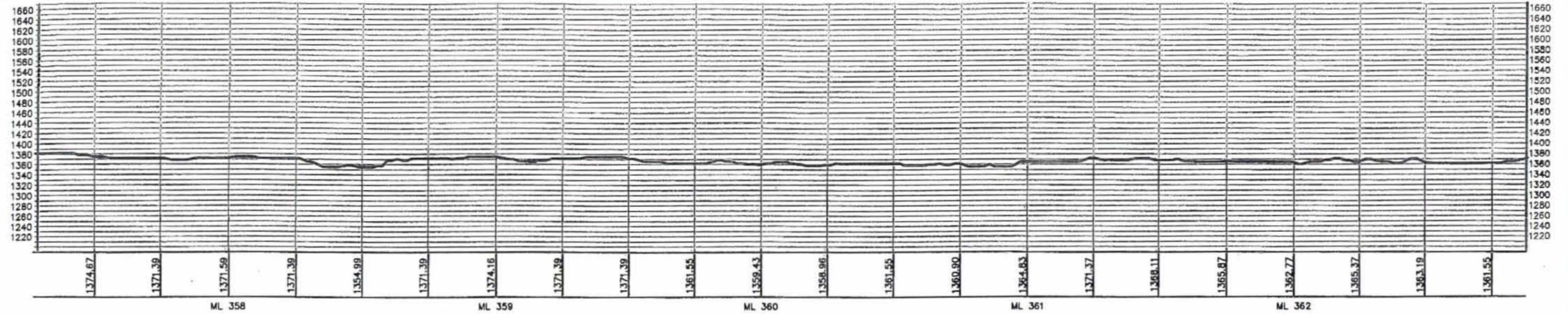


PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-5441 Fax: 1-850-385-5523			 Trow		 TransCanada <i>In business to deliver</i>													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NO.</th> <th style="width: 60%;">REVISION</th> <th style="width: 30%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			NO.	REVISION	DATE										KEYSTONE PIPELINE PROJECT PROPOSED ROUTE BOOK		MAP PARAMETERS PROJECTION: NAD83, UTM: 14N SCALE: 1:24,000; 1" = 2,000'	
NO.	REVISION	DATE																
PROJECT: 50388E			SHEET: 0061		LAST PLOT DATE: Tue, 07 Mar 2006 - 9:50pm													
DRAWING NUMBER: K-46-P-900-A-0022			DRAWN BY: BEK		CHECKED BY: BLS													
ISSUED FOR DEPARTMENT OF STATE FILING: MAR.13.06			APPROVED BY: RG		PROJECT: 50388E													

C:\Users\jgallagher\Desktop\K-46-P-900-A-0022.dwg 11/17/2005 9:58:31 AM EST

CONFIDENTIAL

ELEVATIONS SHOWN IN FEET - VERTICAL = 10x HORIZONTAL SCALE

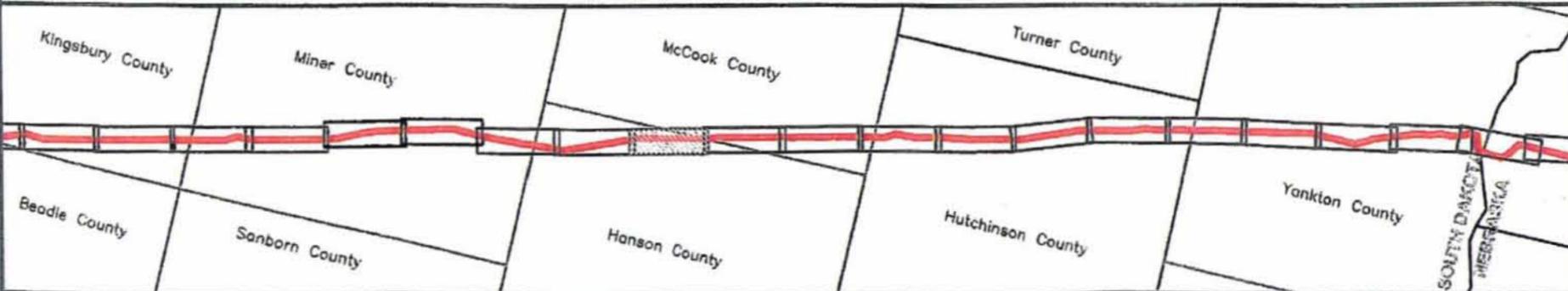
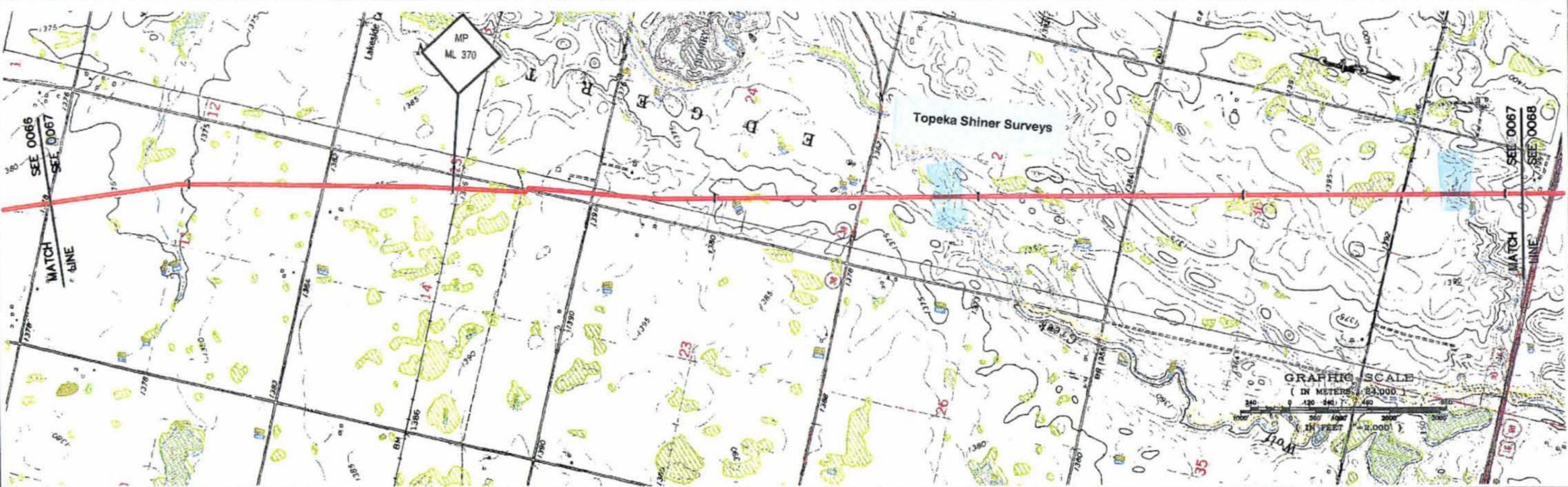
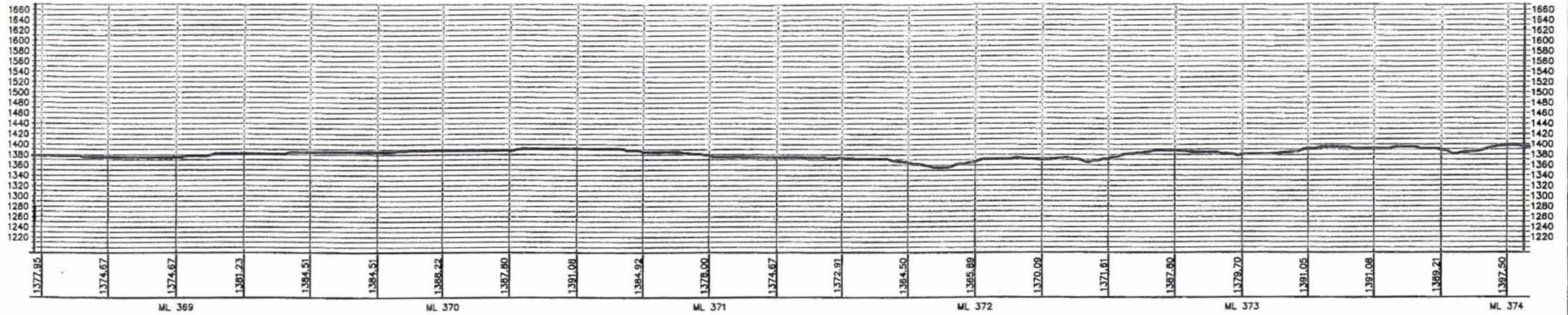


PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-8441 Fax: 1-850-385-8823			 Trow		 TransCanada <i>In business to deliver.</i>							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NO.</th> <th style="width: 40%;">REVISION</th> <th style="width: 50%;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			NO.	REVISION	DATE				KEYSTONE PIPELINE PROJECT PROPOSED ROUTE BOOK			
NO.	REVISION	DATE										
MAP PARAMETERS PROJECTION: NAD83, UTM: 14N SCALE: 1:24,000; 1" = 2,000'												
PROJECT: 50388E			SHEET: 0065									
DRAWING NUMBER: K-46-P-900-A-0026			DRAWN BY: BEK CHECKED BY: BLS APPROVED BY: RG									
LAST PLOT DATE: Sun, 18 Mar 2006 - 3:58pm												

A:\Projects\0065\0065.dwg 14/03/06 10:10:11 AM 3/17/2006 10:10:11 AM

CONFIDENTIAL

ELEVATIONS SHOWN IN FEET - VERTICAL = 10x HORIZONTAL SCALE



PREPARED BY:
TROW ENGINEERING CONSULTANTS, INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida 32308
 Phone: 1-850-365-5441
 Fax: 1-850-365-5523

NO.	REVISION	DATE

ISSUED FOR DEPARTMENT OF STATE FILING MAR. 13. 08

DRAWING NUMBER	DRAWN BY	CHECKED BY	APPROVED BY
K-46-P-900-A-0028	BEK	BLS	RG

TransCanada
In business to deliver

**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

MAP PARAMETERS
 PROJECTION: NAD83, UTM: 14N
 SCALE: 1:24,000; 1" = 2,000'

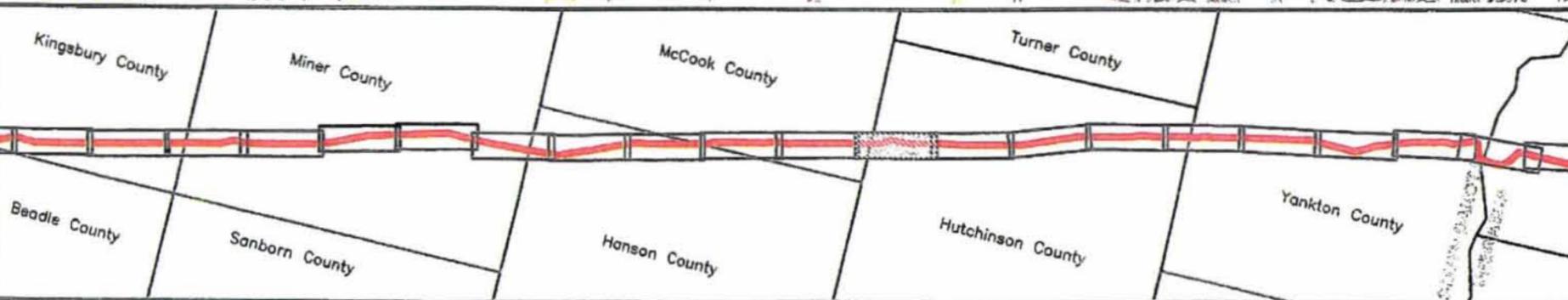
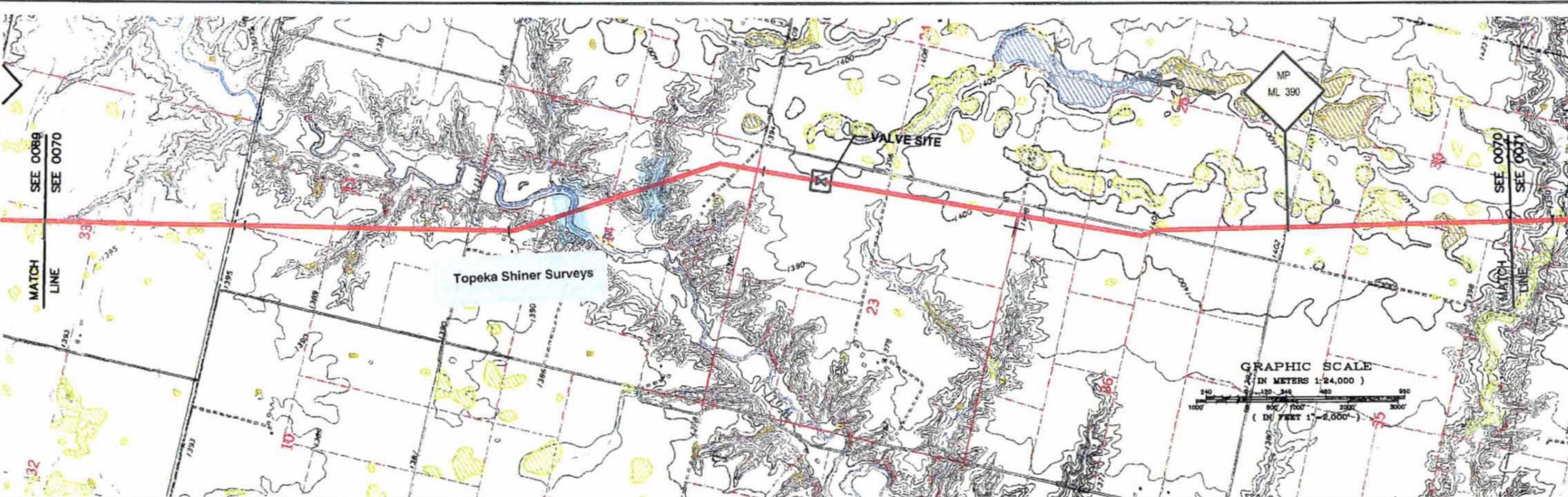
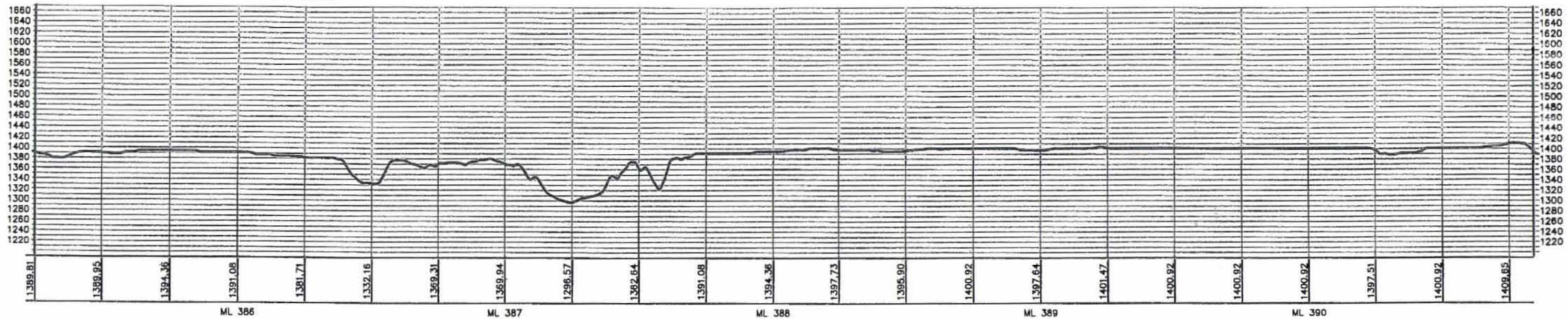
PROJECT:	50388E
SHEET:	0067
LAST PLOT DATE:	Tue, 07 Mar 2006 - 11:11pm

K:\Users\jg\My Documents\KEYSTONE\PROJECTS\REVISED UTM 14N\STATE FILING\K-46-P-900-A-0028-REVISED.dwg 3/7/2006 10:41:01 PM EST



CONFIDENTIAL

ELEVATIONS SHOWN IN FEET - VERTICAL = 10x HORIZONTAL SCALE



PREPARED BY:
TROW ENGINEERING CONSULTANTS, INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida 32308
 Phone: 1-850-385-6441
 Fax: 1-850-385-8523

TransCanada
in business to deliver

**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

MAP PARAMETERS
 PROJECTION: NAD83, UTM: 14N
 SCALE: 1:24000, 1" = 2,000'

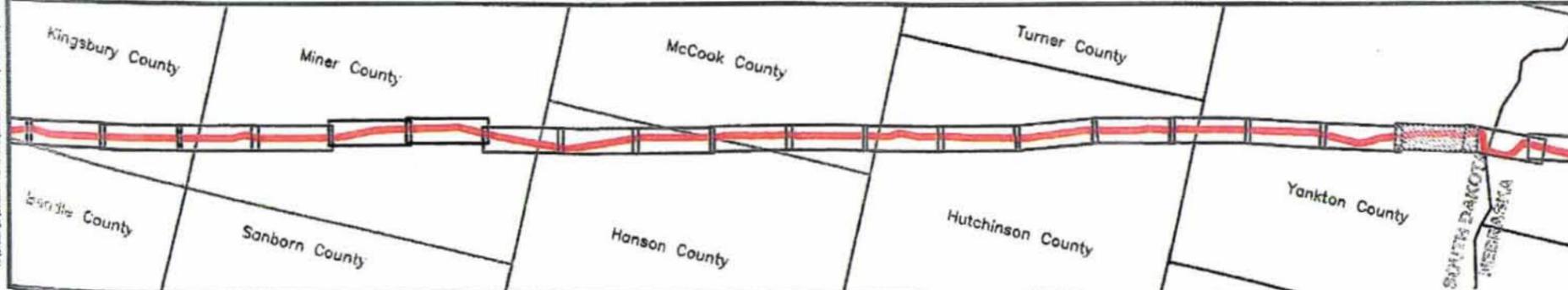
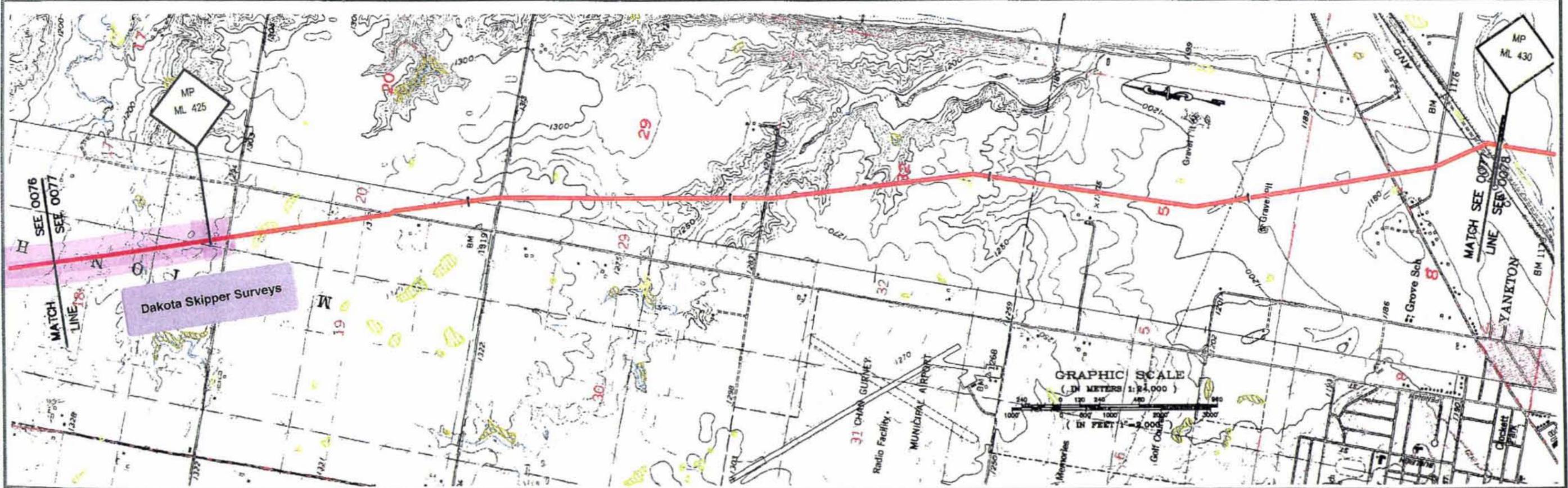
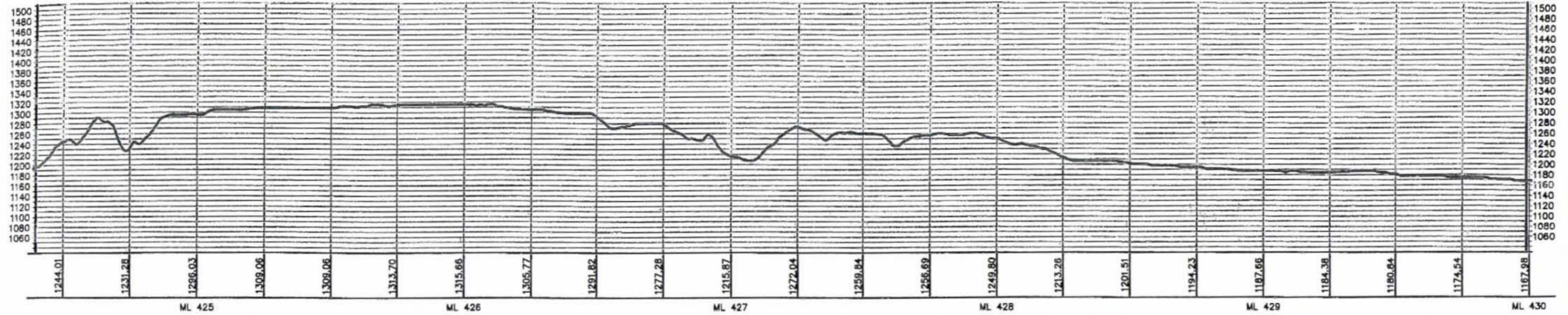
NO.	REVISION	DATE

ISSUED FOR DEPARTMENT OF STATE FILING	MAR.13.06
DRAWING NUMBER	APPROVED BY
K-46-P-900-A-0031	RG
DRAWN BY	CHECKED BY
BEK	BLS

PROJECT: 50388E
 SHEET: 0070
 LAST PLOT DATE: Sun, 19 Mar 2006 - 4:04pm

I:\Projects\50388E\50388E.dwg
 3/7/2006 11:38:07 AM EST

ELEVATIONS SHOWN IN FEET - VERTICAL = 10x HORIZONTAL SCALE



PREPARED BY:
TROW ENGINEERING CONSULTANTS, INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida 32308
 Phone: 1-850-385-8441
 Fax: 1-850-385-8523



**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

MAP PARAMETERS
 PROJECTION: NAD83, UTM: 14N
 SCALE: 1:24,000; 1" = 2,000'

NO.	REVISION	DATE
0	ISSUED FOR DEPARTMENT OF STATE FILING	MAR.12.06
DRAWING NUMBER	DRAWN BY	CHECKED BY
K-46-P-900-A-0038	BEK	BLS

PROJECT:	50388E
SHEET:	0077
APPROVED BY:	RG
LAST PLOT DATE:	Sun, 12 Mar 2006 - 4:19pm

D:\Drawing\GSDMA KEYSTONE\GSDMA KEYSTONE\PROPOSED ROUTE BOOK\MAP 00388E\0077\PROPOSED ROUTE BOOK\MAP 00388E-0077-0077.dwg 3/9/2006 9:23:31 AM EST

CONFIDENTIAL

Stribley, Sara

From: Johnson, Charlie
Sent: Wednesday, August 02, 2006 10:45 AM
To: Doug.Backlund@state.sd.us
Cc: John_Cochnar@fws.gov; Castle, Carla; Stribley, Sara; Ellis, Scott
Subject: RE: SDGFP Meeting Minutes (Keystone Pipeline Project)

Thanks Doug. I will incorporate the change, and thanks for the survey contacts.

-----Original Message-----

From: Doug.Backlund@state.sd.us [mailto:Doug.Backlund@state.sd.us]
Sent: Wednesday, August 02, 2006 10:30 AM
To: Johnson, Charlie; John.Kirk@state.sd.us
Cc: John_Cochnar@fws.gov; Alstad, Jon; Castle, Carla
Subject: RE: SDGFP Meeting Minutes (Keystone Pipeline Project)

I have a couple of comment to add to the minutes. The false-map turtle does occur in the project area, in the Missouri River. However, the HHD crossing would have no impact on the species.

I believe we would defer to the FWS on Topeka shiner issues, since it is not state listed.

Attached are survey protocols that are used in MN and would be perfectly appropriate here too. Also attached is a list of DKS surveyors from Minnesota. We have hired Dennis Skadsen for many surveys in South Dakota. I'm sure any of the folks listed would do a credible job. In addition to those on the list, Gary Marrone is well known as the South Dakota butterfly expert. His contact info is: (605) 223-2842 or GMarrone@aol.com.

For the orchid surveys, Dennis Skadsen would be a good choice. Gary Larson at SDSU would be the better choice if you desire a more comprehensive floral inventory. Gary's contact info is:

Dr. Gary E. Larson
Dept. of Biology/Microbiology
AGH 316, Box 2207B
South Dakota State University
Brookings, SD 57007-2142
phone: 605-688-6141
Gary_Larson@sdstate.edu

Let me know if you have any questions.

Doug
Doug Backlund
S. D. Dept. of Game Fish and Parks
S.D. Natural Heritage Program
523 E. Capitol-Foss Bldg.
Pierre, S.D. 57501

<http://www.sdgfp.info/wildlife/diversity/Index.htm>

-----Original Message-----

From: Johnson, Charlie [mailto:CJohnson@ensr.aecom.com]
Sent: Tuesday, August 01, 2006 5:24 PM
To: Backlund, Doug; Kirk, John J. (B&G)
Cc: John_Cochnar@fws.gov; Alstad, Jon; Castle, Carla
Subject: SDGFP Meeting Minutes (Keystone Pipeline Project)

SDGFP Meeting Minutes

CONFIDENTIAL

Attached are the meeting minutes from the July 11 meeting for the Keystone Pipeline Project. Please review and reply by COB Friday August 4th, if you have any major edits at need to be incorporated into the meeting minutes.

Thanks

Charles Johnson
Senior Wildlife Biologist
ENSR|AECOM
1601 Prospect Parkway
Fort Collins, CO 80525
(970) 493-8878
cjohnson@ensr.aecom.com

CONFIDENTIAL

Johnson, Charlie

From: Doug.Backlund@state.sd.us
Sent: Wednesday, August 02, 2006 10:30 AM
To: Johnson, Charlie; John.Kirk@state.sd.us
Cc: John_Cochnar@fws.gov; Alstad, Jon; Castle, Carla
Subject: RE: SDGFP Meeting Minutes (Keystone Pipeline Project)

Attachments: MNDNR_Dakota_Skipper_Protocol.jpg; MNDNR_Dakota_Skipper_Protocol (2).jpg



MNDNR_Dakota_Skipper_Protocol.jpg
MNDNR_Dakota_Skipper_Protocol (2).jpg

I have a couple of comments to add to the minutes. The false-map turtle does occur in the project area, in the Missouri River. However, the HHD crossing would have no impact on the species.

I believe we would defer to the FWS on Topeka shiner issues, since it is not state listed.

Attached are survey protocols that are used in MN and would be perfectly appropriate here too. Also attached is a list of DKS surveyors from Minnesota. We have hired Dennis Skadsen for many surveys in South Dakota. I'm sure any of the folks listed would do a credible job. In addition to those on the list, Gary Marrone is well known as the South Dakota butterfly expert. His contact info is: (605) 223-2842 or GMarrone@aol.com.

For the orchid surveys, Dennis Skadsen would be a good choice. Gary Larson at SDSU would be the better choice if you desire a more comprehensive floral inventory. Gary's contact info is:

Gary E. Larson
Dept. of Biology/Microbiology
AGH 316, Box 2207B
South Dakota State University
Brookings, SD 57007-2142
phone: 605-688-6141
Gary_Larson@sdstate.edu

Let me know if you have any questions.

Doug
Doug Backlund
S. D. Dept. of Game Fish and Parks
S.D. Natural Heritage Program
523 E. Capitol-Foss Bldg.
Pierre, S.D. 57501

<http://www.sdgifp.info/wildlife/diversity/Index.htm>

-----Original Message-----
From: Johnson, Charlie [mailto:CJohnson@ensr.aecom.com]
Sent: Tuesday, August 01, 2006 5:24 PM
To: Backlund, Doug; Kirk, John J. (B&G)
Cc: John_Cochnar@fws.gov; Alstad, Jon; Castle, Carla
Subject: SDGFP Meeting Minutes (Keystone Pipeline Project)

SDGFP Meeting Minutes

Attached are the meeting minutes from the July 11 meeting for the Keystone Pipeline Project. Please review and reply by COB Friday August 4th, if you have any major edits

CONFIDENTIAL

that need to be incorporated into the meeting minutes.

anks

Charles Johnson
Senior Wildlife Biologist
ENSR|AECOM
1601 Prospect Parkway
Fort Collins, CO 80525
(970) 493-8878
cjohnson@ensr.aecom.com

Johnson, Charlie

From: Johnson, Charlie
Sent: Monday, July 31, 2006 12:40 PM
To: 'doug.backlund@state.sd.us'
Cc: Alstad, Jon; Castle, Carla
Subject: FW: Keystone Pipeline Environmental Report

Doug - As discussed on the phone regarding the Keystone Pipeline Project, since the Keystone Environmental Report is a Department of State (DOS) document, ENSR has little control over its distribution and the DOS would like to know who has a copy of the document. Consequently, in order for the SDGF&P to obtain a copy, please request a copy (s) directly from the DOS. Below is the contact information for the DOS lead. Please let me know if you have any problems.

Matthew T. McManus
Division Chief, Energy Producer Country Affairs
U.S. Department of State
2201 C Street, N.W.
EB/ESC/IEC
Room 7525
Washington, D.C. 20520
(202) 647-3423
McManusMT@State.gov

Charles Johnson
Senior Wildlife Biologist
ENSR/AECOM
1601 Prospect Parkway
Fort Collins, CO 80525
(970) 493-8878
cjohnson@ensr.aecom.com

CONFIDENTIAL

Johnson, Charlie

From: Johnson, Charlie
Sent: Wednesday, July 26, 2006 1:12 PM
To: 'John_Cochnar@fws.gov'
Subject: FW: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

FYI regarding Mussels along the James River.

-----Original Message-----

From: Stribley, Sara
Sent: Wednesday, July 26, 2006 12:30 PM
To: Johnson, Charlie
Subject: FW: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

-----Original Message-----

From: Doug.Backlund@state.sd.us [mailto:Doug.Backlund@state.sd.us]
Sent: Wednesday, July 26, 2006 12:28 PM
To: Stribley, Sara
Cc: Leslie.Petersen@state.sd.us; John.Kirk2@state.sd.us
Subject: RE: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

Sara:

I don't think there is much chance that winged mapleleaf still occurs in the James River. Of the 12,000 or so specimens we examined during our 2002-03 survey of the James River, only one single valve was id'd as winged mapleleaf and it was an old relic shell. At our July 11th meeting, we discussed a survey of the James River crossing for mussel beds. It is possible that the crossing site could harbor a significant mussel bed that might include rare species, if not T&E species. It is my understanding that the James River crossing is by means of trenching which would be very destructive to mussel beds. Now would be good time to do it, the water is low and a survey would be very simple to accomplish.

Given the method of placing the pipeline under the Missouri River and the avoidance of disturbance of the river bed, I don't see a need for mussel surveys there and I agree with the FWS on that.

Doug

-----Original Message-----

From: Stribley, Sara [mailto:sstribley@ensr.aecom.com]
Sent: Wednesday, July 26, 2006 1:02 PM
To: Backlund, Doug
Subject: RE: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

Thanks for the clarification Doug! So would you still recommend that we survey the James River for potential winged mapleleaf mussels? Would you also be in agreement with the FWS that surveys would not be required at the Missouri River for the scaleshell and Higgins eye mussel since the river will be HDD?

Sara

-----Original Message-----

From: Doug.Backlund@state.sd.us [mailto:Doug.Backlund@state.sd.us]
Sent: Wednesday, July 26, 2006 7:10 AM
To: Stribley, Sara

CONFIDENTIAL

Subject: RE: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas -
Keystone Pipeline Project

Re:

You are right. The winged mapleleaf used to occur in the James River. We have only found old relic shells of that species. The scaleshell and the Higgins eye have only been found in the Missouri River, below Gavins Point Dam.

Doug

-----Original Message-----

From: Stribley, Sara [mailto:sstribley@ensr.aecom.com]
Sent: Tuesday, July 25, 2006 5:20 PM
To: Backlund, Doug
Cc: Johnson, Charlie
Subject: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas -
Keystone Pipeline Project

Hi Doug,

In reviewing some of the notes from the ENSR-SDGFP meeting on July 11th in Pierre, SD, and the ENSR-USFWS meeting on July 18th in Grand Island, NE, I noticed a divergence between the information provided on required surveys for the Higgins eye pearly, Winged mapleleaf, and Scaleshell mussels. In summary, the information provided by the SDGFP states (please correct me if I am wrong!):

Habitat for the Higgins eye pearly, Winged mapleleaf, and Scaleshell mussel would be limited to the James River. This area should be examined for potential habitat by an experienced biologist (recommend Keith Perkins, University of Sioux Falls).

On the other hand, the information provided from the meeting with the USFWS in NE states:

The Higgins eye pearly, Winged mapleleaf, and Scaleshell mussel would be restricted to the Missouri River. Since the construction method at the Missouri River would be HDD, it was concluded that these species would not be impacted and no surveys would be required.

I think perhaps the Winged mapleleaf occurs in the James River, and the Scaleshell and Higgins eye pearly mussel occur in the Missouri River? In that case, both of the statements could be partially true. Would you be able to provide some clarification or concurrence on the statements made above? Thanks for your input!

Sincerely,
Sara

Sara Stribley
Staff Specialist
ENSR Corporation
1601 Prospect Pkwy
Fort Collins, CO 80525
970.493.8878 ext. 168
<mailto:sstribley@ensr.aecom.com> sstribley@ensr.aecom.com

CONFIDENTIAL

FOR INTERNAL KEYSTONE PROJECT USE ONLY

TransCanada – Keystone Pipeline Contact Summary Form

Location of Meeting ENSR
Date/Time of Meeting 7/26/06
Keystone Team Member(s) Sara Stribley

Contact Information:

Name	Doug Backlund
Title	Wildlife Biologist
Organization	South Dakota Game, Fish, & Parks
Address	Foss Building, 523 East Capitol Pierre, South Dakota 57501-3182
County	
Phone	605-773-3381
E-mail address	Doug.Backlund@state.sd.us

Meeting Information:

Type of Contact (phone, in-person, etc.): E-mail

Issue: Clarification on Mussel Surveys

Concern Level: High Moderate Low

Description:

From: Doug.Backlund@state.sd.us [mailto:Doug.Backlund@state.sd.us]
Sent: Wednesday, July 26, 2006 12:28 PM
To: Stribley, Sara
Cc: Leslie.Petersen@state.sd.us; John.Kirk2@state.sd.us
Subject: RE: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

Sara:

I don't think there is much chance that winged mapleleaf still occurs in the James River. Out of the 12,000 or so specimens we examined during our 2002-03 survey of the James River, only one single valve was id'd as winged mapleleaf and it was an old relic shell. At our July 11th meeting, we discussed a survey of the James River crossing for mussel beds. It is possible that the crossing site could harbor a significant mussel bed that might include rare species, if not T&E species. It is my understanding that the James River crossing is by means of trenching which would be very destructive to mussel beds. Now would be good time to do it, the water is low and a survey would be very simple to

J:\10000\10623-004-KEYSTONE\Surveys\Biological Surveys\Correspondence\SDGPC_D Backlund_072606_SS.doc

CONFIDENTIAL

FOR INTERNAL KEYSTONE PROJECT USE ONLY

accomplish.

Given the method of placing the pipeline under the Missouri River and the avoidance of disturbance of the river bed, I don't see a need for mussel surveys there and I agree with the FWS on that.

Doug

-----Original Message-----

From: Stribley, Sara [mailto:sstribley@ensr.aecom.com]
Sent: Wednesday, July 26, 2006 1:02 PM
To: Backlund, Doug
Subject: RE: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

Thanks for the clarification Doug! So would you still recommend that we survey the James River for potential winged mapleleaf mussels? Would you also be in agreement with the FWS that surveys would not be required at the Missouri River for the scaleshell and Higgins eye mussel since the river will be HDD?

Sara

-----Original Message-----

From: Doug.Backlund@state.sd.us [mailto:Doug.Backlund@state.sd.us]
Sent: Wednesday, July 26, 2006 7:10 AM
To: Stribley, Sara
Subject: RE: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

Sara:

You are right. The winged mapleleaf used to occur in the James River. We have only found old relic shells of that species. The scaleshell and the Higgins eye have only been found in the Missouri River, below Gavins Point Dam.

Doug

-----Original Message-----

From: Stribley, Sara [mailto:sstribley@ensr.aecom.com]
Sent: Tuesday, July 25, 2006 5:20 PM
To: Backlund, Doug
Cc: Johnson, Charlie
Subject: Higgins Eye, Scaleshell, Winged Mapleleaf Survey Areas - Keystone Pipeline Project

Hi Doug,

In reviewing some of the notes from the ENSR-SDGFP meeting on July 11th in Pierre, SD, and the ENSR-USFWS meeting on July 18th in Grand Island, NE, I noticed a divergence between the information provided on required surveys for the Higgins eye pearly, Winged mapleleaf, and Scaleshell mussels. In summary, the information provided by the SDGFP states (please correct me if I am wrong!):

Habitat for the Higgins eye pearly, Winged mapleleaf, and Scaleshell mussel would be limited to the James River. This area should be examined for potential habitat by an experienced biologist (recommend Keith Perkins, University of Sioux Falls).

CONFIDENTIAL

FOR INTERNAL KEYSTONE PROJECT USE ONLY

. the other hand, the information provided from the meeting with the USFWS in NE states:

The Higgins eye pearly, Winged mapleleaf, and Scaleshell mussel would be restricted to the Missouri River. Since the construction method at the Missouri River would be HDD, it was concluded that these species would not be impacted and no surveys would be required.

I think perhaps the Winged mapleleaf occurs in the James River, and the Scaleshell and Higgins eye pearly mussel occur in the Missouri River? In that case, both of the statements could be partially true. Would you be able to provide some clarification or concurrence on the statements made above? Thanks for your input!

Sincerely,
Sara

Sara Stribley
Staff Specialist
ENSR Corporation
1601 Prospect Pkwy
Fort Collins, CO 80525
970.493.8878 ext. 168
<mailto:sstribley@ensr.aecom.com> sstribley@ensr.aecom.com

Issue: _____ Concern Level: High__Moderate__Low__.

Description:

CONFIDENTIAL

Table 1
South Dakota Special Status Species
Habitat by County and Mainline Milepost
Keystone Pipeline Project

Species	Status	Habitat Association	Primary Habitat	County	Miles (mi) of Associated Habitat Crossed by Keystone Pipeline Project					Mainline Milepost(s)
					Grassland (mi)	Forests and Woodlands (mi)	Riparian (mi)	Nonforested Emergent Wetland (mi) ¹	Open Water (mi) (habitat crossed or within 0.5 mi)	
Bald eagle <i>Haliaeetus leucocephalus</i>	FT; SD-T	This species typically occurs near large bodies of water that support suitable roosting and foraging habitat. Nest sites typically occur in proximity to open water and generally are found in mature heterogeneous stands of multi-storied trees, but also may nest on cliffs. Winter habitat typically includes areas of open water, adequate food sources, and sufficient diurnal perches and night roosts. Breeding season: January through July. Winter season: November 15 through March 15.	riparian forests, open water	Beadle Clark Day Hanson Hutchinson Kingsbury Marshall McCook Miner Yankton					Beadle: 0 Clark: 0 (Fordham Res.) Day: 0 (Amsden Lake) Hanson: 0 (Lutz Lake, Spring Lake, Lake Eli) Hutchinson: 0 (Lake) Kingsbury: 0 Marshall: 0 McCook: 0 Miner: 0 (Twin Lakes) Yankton: 0.1 (James River)	Beadle: N/A Clark: 295.2 - 296.0 Day: 254.8 - 255.2 Hanson: 362.6 - 369.8 Hutchinson: 388.8 - 389.5 Kingsbury: N/A Marshall: N/A McCook: N/A Miner: 351.0 - 352.5 Yankton: 417.9 - 418.0
Eskimo curlew <i>Numenius borealis</i>	FE; SD-E	This species is a rare spring migrant that feeds and rests in burned-over prairies, agricultural areas, wetlands, and marshes.	prairies, wetlands, agriculture	Clark	Clark: 4.5			data pending		Clark: 277.5 - 302.6; data pending
Interior least tern <i>Sterna antillarum athalassos</i>	FE; SD-E	Nesting habitat consists of sparsely vegetated sandy, gravelly, or silty, beaches and sandbars within wide, unobstructed river channels or salt flats along lake shorelines and irrigation reservoirs. Nest locations are generally away from the water's edge since nesting typically begins while river flows are high and relatively small amounts of sandy habitat is exposed. Breeding season: May 1 through August 15.	shorelines and sandbars of rivers, lakes, reservoirs	Clark Hutchinson Yankton				data pending data pending data pending	Clark: 0 (Fordham Res.) Hutchinson: 0 (Lake) Yankton: 0.1 (James River)	Clark: 295.2 - 296.0; data pending Hutchinson: 388.8 - 389.5; data pending Yankton: 417.9 - 418.0; data pending
Piping plover <i>Charadrius melodus</i>	FT; SD-T	This species inhabits open sandy areas and saline flats with little vegetation along rivers, lakes, ponds, and marshlands. It nests on sandbars and sand and gravel beaches with short, sparse vegetation along inland lakes, on natural and dredge islands in rivers, on gravel pits along rivers, and on salt-encrusted bare areas on interior alkali ponds and lakes. Sparse clumps of grass or herbaceous vegetation are important habitat components. Breeding season: May 1 through August 15.	shorelines, sandbars, wetlands, rivers, lakes, ponds	Clark Day Kingsbury Yankton (Missouri River between Yankton County, South Dakota and Cedar County, Nebraska is designated as critical habitat by USFWS)				data pending data pending data pending	Clark: 0 (Playas, Logan Res., Fordham Res.) Day: 0 (Amsden Lake, Playas) Kingsbury: 0.4 (Playas) Yankton: 0.1 (James River, Playas)	Clark: 269.8 - 296.0; data pending Day: 254.8-255.2; 265.0; data pending Kingsbury: 321.3 - 335.8; data pending Yankton: 410.0 - 418.0; data pending
Whooping crane <i>Grus americana</i>	FE; SD-E	During migration, this species feeds and roosts in a variety of habitats including croplands, large and small freshwater marshes, the margins of lakes and reservoirs, and submerged sandbars in rivers. Spring and Fall migration through the project regions generally occurs from February through April and from October through November, respectively.	wetlands, riparian, agriculture	Beadle Clark Kingsbury Yankton				data pending data pending data pending	Beadle: 0 Clark: 0 (Fordham Res.) Kingsbury: 0 Yankton: 0.1 (James River)	Beadle: data pending Clark: 295.2 - 296.0; data pending Kingsbury: data pending Yankton: 417.9 - 418.0; data pending
Pallid sturgeon <i>Scaphirhynchus albus</i>	FE; SD-E	This species is distributed from the headwaters of the Missouri River (Fort Benton-Great Falls, Montana) through the Mississippi River to New Orleans, Louisiana. It inhabits bottom areas of large turbid rivers that have strong current and a firm sandy substrate. They also may be found along sandbars and behind wing dikes. Spawning period: April through August.	large, turbid rivers, sand substrate	Yankton					Yankton: 0.1 (James River), 0.2 (Missouri River)	Yankton: 417.9-418.0 (James River), 431.9 - 432.3 (Missouri River)
Sicklefin chub <i>Macrhybopsis meeki</i>	SD-E	This species requires continuously and heavily turbid waters of large rivers where it frequents areas of strong current flowing over sand or gravel substrate. Spawning period: spring (likely from late March and May).	large, turbid rivers, sand substrate	Yankton					Yankton: 0.2 (Missouri River)	Yankton: 431.9-432.3

¹ Data pending; waiting on completion of wetland/waterbody surveys to determine total wetland habitat crossed by project.

CONFIDENTIAL

Table 1
South Dakota Special Status Species
Habitat by County and Mainline Milepost
Keystone Pipeline Project

Species	Status	Habitat Association	Primary Habitat	County	Miles (mi) of Associated Habitat Crossed by Keystone Pipeline Project				Mainline Milepost(s)	
					Grassland (mi)	Forests and Woodlands (mi)	Riparian (mi)	Nonforested Emergent Wetland (mi)		Open Water (mi) (habitat crossed or within 0.5 mi)
Sturgeon chub <i>Macrhybopsis gelida</i>	SD-T	This species prefers large turbid sandy rivers over substrate of small gravel and coarse sand. It is often found in areas swept by currents especially at heads of islands or exposed sandbars. Spawning period: late spring to midsummer.	large, turbid rivers, sand substrate	Yankton					Yankton: 0.2 (Missouri River)	Yankton: 431.9-432.3
Topeka shiner <i>Notropis topeka</i>	FE; SD-SC	This species inhabits pool and run areas in the headwaters of small prairie streams with high water quality and cool temperatures. These streams generally exhibit intermittent flow during summer; however pools are maintained by spring or groundwater percolation. The substrate of these occupied streams consist mainly of clean gravel, however bedrock and clay hardpan overlain by a thin silt layer are not uncommon. Spawning period: late spring and summer.	small, cool, [often intermittent] prairie streams	Beadle Hanson Hutchinson Kingsbury McCook Miner Yankton					Beadle: 0.1 (Shue Creek, Middle Fork Pearl Creek) Hanson: 0.1 (Wolf Creek) Hutchinson: 0.1 (Wolf Creek) Kingsbury: 0.1 (South Fork Pearl Creek) McCook: 0.1 (Wolf Creek) Miner: 0.2 (Redstone Creek, Rock Creek) Yankton: 0.3 (James River, Missouri River)	Beadle: 309.4 (Shue Creek), 314.1 (Middle Fork Pearl Creek) Hanson: 371.9 (Wolf Creek) Hutchinson: 387.2 (Wolf Creek) Kingsbury: 322.4 (South Fork Pearl Creek) McCook: 380.4 (Wolf Creek) Miner: 339.3 (Redstone Creek), 358.5 (Rock Creek) Yankton: 417.9-418.0 (James River), 431.9-432.3 (Missouri River)
False map turtle <i>Graptemys pseudogeographica</i>	SD-T	This species inhabits slow to swift current rivers and streams, river sloughs, oxbow lakes, ponds, impoundments, and backwaters. They are devoted baskers, often resting just below the surface on submerged branches from fallen trees and projecting logs.	rivers, streams, sloughs, ponds, backwaters, impoundments	Yankton					Yankton: 0.2 (Missouri River)	Yankton: 431.9 - 432.3
Dakota skipper <i>Hesperia dacotae</i>	FC; SD-SC	This species is considered an obligate of undisturbed native prairie. The butterfly inhabits wet lowland prairie dominated by bluestem grasses and dry upland prairie dominated by mixed bluestem and needle stem grasses. Both habitat types contain an abundance of flowering plants and have alkaline soils. Adults emerge in mid-June to early July, and mate during a flight period that lasts for about three weeks.	lowland and upland prairie	Clark Day Marshall Yankton	Clark: 4.5 Day: 6.7 Marshall: 5.1 Yankton: 2.1					Clark: 277.5 - 302.6 Day: 250.6 - 268.1 Marshall: 215.0 - 222.8 Yankton: 415.0 - 425.1
Higgins' eye pearl mussel <i>Lampsilis higginsii</i>	FE; SD-SC	Found in substrates of mud with a mixture of gravel and stones. Prefers rapidly flowing water. The exact breeding season is unknown.	fast flowing creeks and rivers, mud substrate	Yankton					Yankton: 0.2 (Missouri River)	Yankton: 431.9 - 432.3
Scaleshell mussel <i>Leptodea leptodon</i>	FE; SD-SC	Occurs in riffles with moderate to high gradients in creeks to large rivers. Typically associated with riffles, relatively strong currents, and substrate of mud, sand, or assemblages of gravel, cobble, and boulder. Restricted to rivers with relatively good water quality in stretches with stable channels. Little is known concerning the reproduction of this species.	creeks and rivers with good water quality and stable channels	Yankton					Yankton: 0.2 (Missouri River)	Yankton: 431.9 - 432.3
Winged mapleleaf <i>Quadrula gragosa</i>	FE; SD-SC	The species is found in riffles with clean gravel, sand, or rubble bottoms.	rivers, streams	Yankton					Yankton: 0.1 (James River)	Yankton: 417.9-418.0
Western prairie fringed orchid <i>Platanthera praeclara</i>	FT; SD-SC	Occurs in mesic upland tallgrass prairie in the southern part of its range, often in swales, and wet-mesic tallgrass prairie and sedge meadows in the northern part of its range. Also known from prairies and swales in sand dune complexes that are fed by shallow underground water. Flowers June-July.	tallgrass prairie, dune complexes	Clark Day Yankton	Clark: 4.5 Day: 6.7 Yankton: 2.1			<i>data pending</i> <i>data pending</i> <i>data pending</i>		Clark: 277.5 - 302.6; <i>data pending</i> Day: 250.6 - 268.1; <i>data pending</i> Yankton: 415.0 - 425.1; <i>data pending</i>

¹ Data pending; waiting on completion of wetland/waterbody surveys to determine total wetland habitat crossed by project.

CONFIDENTIAL

Table 2
Keystone Special Status Species
Total Habitat Crossed by State

Species	Status	Habitat Association	Primary Habitat	Habitat by County and State, and Total Distance (mi) Crossed								
				ND	SD	NE	KS	MO	IL			
Mammals												
Gray bat <i>Myotis grisescens</i>	FE; MO-E; IL-E	This species forages primarily within forested areas along streams and lakes. Winter roosts are in deep vertical caves with domed halls. Large summer colonies utilize caves that trap warm air and provide restricted rooms or domed ceilings. Maternity roosts typically are in caves with stream flow and are separate from summer bachelor roosts.	Riparian woodlands, caves							Madison	6.7	
Indiana bat <i>Myotis sodalis</i>	FE; MO-E; IL-E	This species forages primarily in riparian forests and flood-plains, as well as in upland forests, low field, and pastures. Maternity roosts are located beneath loose bark of living and dead trees (especially oak and hickory spp.). Young are generally born in June. Winter hibernacula occur in caves and mines with 85% of this species population hibernating in Shannon, Washington, and Iron counties, MO.	Riparian woodlands, upland forests, pastures, caves						Audrain Buchanan Caldwell Carroll Chariton Clinton Lincoln Montgomery Randolph St. Charles	3.7 4.5 3.1 3.4 4.1 1.4 10.1 4.6 3.6 0.6	Bond Fayette Madison Marion	1.9 3.4 6.7 0.0
Gray wolf <i>Canis lupus</i>	FT; ND-SC	No particular habitat preference. Habitats may include: alpine, desert, conifer forest, hardwood forest, mixed forest, grasslands, savannas, shrubland/ chaparral, tundra, and woodlands.	Any	Cavalier Grnd Fks Nelson Pembina Sargent Walsh	0.0 0.0 0.2 2.9 8.4 1.7							
Fisher <i>Martes pennanti</i>	FC; ND-SC	This species inhabits upland and lowland forests, including coniferous, mixed, and deciduous forests. Fishers generally avoid areas with little forest cover or significant human disturbance and conversely prefer large areas of contiguous interior forest.	Forests and woodlands	Pembina	2.9							
Plains spotted skunk <i>Spilogale putorius interrupta</i>	SD-SC; MO-E	This species inhabits upland grassland prairie, brushy areas, cultivated land, and forests. Their dens are located below ground in grassy banks, rocky crevices or along fence rows, as well as above ground in hay stacks, woodpiles, hollow logs, trees, or on brushy heaps. Young are born from April to July.	Grasslands, shrublands, upland forests, agriculture edge						Chariton	17.0		
Eastern spotted skunk <i>Spilogale putorius</i>	KS-T; MO-E; SD-SC	This species prefers forest edge, prairie, brushy areas, and cultivated land, especially if rock outcrops and shrubs are present. Their dens are located below ground in grassy banks, rocky crevices or along fence rows, as well as above ground in hay stacks, woodpiles, brushy heaps, hollow logs, and abandoned buildings or outbuildings. Young are born in May or June.	Grasslands, shrublands, upland forests, agriculture edge					Brown Doniphan Marshall Nemaha	7.9 4.2 6.9 5.3	St. Charles	1.1	

¹Data pending; waiting on completion of wetland/waterbody surveys to determine total habitat crossed (mi); totals likely to change

CONFIDENTIAL

Table 2
Keystone Special Status Species
Total Habitat Crossed by State

Species	Status	Habitat Association	Primary Habitat	Habitat by County and State, and Total Distance (mi) Crossed											
				ND		SD		NE		KS		MO		IL	
River otter <i>Lontra Canadensis</i>	IL-E	Key habitats are rivers, streams, lakes, ponds, marshes, estuaries, and beaver flowages, especially near waterbodies with wooded shorelines or nearby wetlands. When inactive, occupies hollow logs, spaces under roots, logs, or overhangs, abandoned beaver lodges, dense thickets near water, or burrows of other animals; such sites also are used for rearing young	rivers, streams, lakes, ponds, marshes, wetlands					Colfax Stanton	0.5 0.2					Bond Fayette	0.1 3.1
Birds															
Least bittern <i>Ixobrychus exilis</i>	MO-SC; IL-T	Nest in freshwater wetlands with dense, tall growths of emergent vegetation (particularly <i>Typha</i> spp., <i>Carex</i> spp., <i>Scirpus</i> spp., or <i>Phragmites australis</i>) interspersed with some woody vegetation and open, fresh water. In the north-central U.S., breeding and nesting may occur from May-July. Incubation lasts for 17-20 days; young usually leave nest by the 13 th -15th day.	Wetlands, lakes, open water											Fayette Madison	0.0 ¹ 0.0 ¹
Bald eagle <i>Haliaeetus leucocephalus</i>	FT; ND-SC; SD-T; NE-T; KS-T; MO-E; IL-T; OK-T	This species typically occurs near large bodies of water that support suitable roosting and foraging habitat. Nest sites are located in proximity to open water and generally are found in mature heterogeneous stands of multi-storied trees, but also may nest on cliffs. Winter habitat typically includes areas of open water, adequate food sources, and sufficient diurnal perches and night roosts. Breeding season: January through July. Winter season: November 15 through March 15.	Riparian forests, open water	Barnes Cavalier Grnd Fks Nelson Pembina Ransom Sargent Steele Walsh	0.0 0.0 0.0 0.0 0.1 0.2 0.0 0.0 0.3	Beadle Clark Day Hanson Hutchinson Kingsbury Marshall McCook Miner Yankton	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.1	Butler Cedar Colfax Gage Jefferson Platte Saline Seward Stanton Wayne	0.0 0.2 0.5 0.0 0.0 0.0 0.2 0.1 0.2 0.0	Brown Doniphan Marshall Nemaha	0.0 0.2 0.1 0.0	Buchanan Carroll Chariton Clinton Lincoln Montgomery St. Charles	0.2 0.0 0.7 0.0 0.2 0.0 0.3	Bond Fayette Madison	0.1 3.1 1.1
Peregrine falcon <i>Falco peregrinus</i>	IL-T; NE-SC; KS-E	This species is found over a wide variety of habitats, but are generally located near open water or marshes that support high concentration of shorebirds or waterfowl. Nest sites occur on tall steep-walled cliffs, bridges, or buildings. Preferred foraging habitat includes lakes, rivers, and wet meadows. Breeding season: April 15 to July 15.	Wetlands, lakes, open water							Brown Doniphan Marshall Nemaha	0.0 ¹ 0.0 ¹ 0.0 ¹ 0.0 ¹			Madison	2.1 ¹
Greater Prairie-chicken <i>Tympanuchus cupido</i>	MO-E; ND-SC	Prime habitat for this species includes mid-grass and tall-grass prairies bordered by open oak woodlands, oak forests, and cropland. In western Kansas, they nest in sand-sage prairie and forage in corn and wheat fields. In Missouri, nesting habitat is limited to cropland and nearby prairies mainly on the Osage Plains. Breeding season: March through July.	Shortgrass, tallgrass, upland forest, agriculture										Audrain Carroll	5.9 13	
King rail <i>Rallus elegans</i>	MO-E; NE-SC	This species inhabits fresh and brackish wetlands. King rails prefer wetlands with abundant grasses, sedges, rushes and cattails. Nest sites occur in herbaceous cover over shallow water in river floodplains. The adult King Rail molts completely after nesting and is flightless for nearly a month. Breeding season: April-June	Wetlands										Carroll Lincoln St. Charles	0.0 ¹ 0.0 ¹ 0.0 ¹	

¹ Data pending; waiting on completion of wetland/waterbody surveys to determine total habitat crossed (mi); totals likely to change

CONFIDENTIAL

Table 2
Keystone Special Status Species
Total Habitat Crossed by State

Species	Status	Habitat Association	Primary Habitat	Habitat by County and State, and Total Distance (mi) Crossed											
				ND		SD		NE		KS		MO		IL	
Whooping crane <i>Grus americana</i>	FE; ND-SC; SD-E; NE-E; OK-E; KS-E	During migration, this species feeds and roosts in a variety of habitats including croplands, large and small freshwater marshes, the margins of lakes and reservoirs, and submerged sandbars in rivers. Spring and Fall migration through the project regions generally occurs from February through April and from October through November, respectively.	Wetlands, riparian, agriculture	Barnes Cavalier Nelson	0.0 ¹ 0.0 ¹ 0.2 ¹	Beadle Clark Kingsbury Yankton	0.0 ¹ 0.0 ¹ 0.0 ¹ 0.1 ¹	Colfax Saline Seward Stanton	0.5 ¹ 0.2 ¹ 0.1 ¹ 0.2 ¹	Brown Doniphan Marshall Nemaha	0.0 ¹ 0.2 ¹ 0.1 ¹ 0.0 ¹				
Snowy plover <i>Charadrius alexandrinus</i>	KS-T	This species inhabits open alkaline flats, mudflats, sandy shorelines, sandbars with little vegetation along rivers, lakes, ponds, and marshlands. Nesting often occurs on white saline flats. Breeding season: May 1 through August 15.	Shorelines, sandbars, wetlands, rivers, lakes, ponds							Brown Doniphan Marshall Nemaha	0.0 ¹ 0.2 ¹ 0.0 ¹ 0.0 ¹				
Piping plover <i>Charadrius melodus</i>	FT; ND-SC; SD-T; NE-T; KS-T	This species inhabits open sandy areas and saline flats with little vegetation along rivers, lakes, ponds, and marshlands. It nests on sandbars and sand and gravel beaches with short, sparse vegetation along inland lakes, on natural and dredge islands in rivers, on gravel pits along rivers, and on salt-encrusted bare areas on interior alkali ponds and lakes. Sparse clumps of grass or herbaceous vegetation are important habitat components. Breeding season: May 1 through August 15.	Shorelines, sandbars, wetlands, rivers, lakes, ponds	Sargent		Clark Day Kingsbury Yankton	0.0 ¹ 0.0 ¹ 0.4 ¹ 0.1 ¹	Butler Cedar Colfax Gage Jefferson Platte Saline Seward Stanton	0.0 ¹ 0.2 ¹ 0.5 ¹ 0.0 ¹ 0.0 ¹ 0.0 ¹ 0.2 ¹ 0.1 ¹ 0.2 ¹	Brown Doniphan Marshall Nemaha	0.0 ¹ 0.2 ¹ 0.1 ¹ 0.0 ¹				
kimo curlew <i>Numenius borealis</i>	FE; SD-E; KS-E	This species is a nearly extinct spring migrant that feeds and rests in burned-over prairies, agricultural areas, wetlands, and marshes.	Prairies, wetlands, agriculture			Clark	4.5 ¹			Brown Doniphan Marshall Nemaha	4.9 ¹ 1.8 ¹ 5.6 ¹ 4.7 ¹				
Interior least tern <i>Sterna antillarum athalassos</i>	FE; SD-E; NE-E; MO-E; OK-E; KS-E	Nesting habitat consists of sparsely vegetated sandy, gravelly, or silty beaches and sandbars within wide, unobstructed river channels or salt flats along lake shorelines and irrigation reservoirs. Nest locations are generally away from the water's edge since nesting typically begins while river flows are high and relatively small amounts of sandy habitat is exposed. Breeding season: May 1 through August 15.	Shorelines and sandbars or rivers, lakes, reservoirs			Clark Yankton	0.0 ¹ 0.1 ¹	Butler Cedar Colfax Gage Jefferson Platte Saline Seward Stanton	0.0 ¹ 0.2 ¹ 0.5 ¹ 0.0 ¹ 0.0 ¹ 0.0 ¹ 0.2 ¹ 0.1 ¹ 0.2 ¹	Brown Doniphan Marshall Nemaha	0.0 ¹ 0.2 ¹ 0.1 ¹ 0.0 ¹	Chariton St. Charles	0.7 ¹ 0.3 ¹		
Barn owl <i>Tyto alba</i>	MO-E; IL-E	This cavity-nesting species is primarily a bird of open country - residential and agricultural areas, old fields and woodland edges. Nests in buildings, tree cavities, caves, cliff crevices, and cut bank burrows Breeding season: late winter, spring, and/or early summer.	Grasslands, woodlands, agriculture									St. Charles	1.7	Fayette Marion	0.0 0.0
Loggerhead shrike <i>Lanius ludovicianus</i>	MO-SC; IL-T	This species is found in open areas with mixed shrub/brush hedgerows and scattered thorny trees. Thorny plant species (osage orange, honey locus, multiflora rose, wild crabapple) are important for impaling prey. In MO and IL, nesting peaks in late April, with a second peak in late May in MO.	Shrublands, uplands											Bond Fayette Marion	2.1 0.0 0.0

¹Data pending; waiting on completion of wetland/waterbody surveys to determine total habitat crossed (mi); totals likely to change