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Table 1
Missouri 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)	
Indiana bat <i>Myotis sodalis</i>	FE; MO-E	Oct to March	One ground survey to identify potential maternity roost trees along ROW that may need to be removed	ENSR needs to contact MO FWS to determine further survey requirements.	Audrain Buchanan Caldwell Carroll Chariton Clinton Lincoln Montgomery Randolph St.Charles		Audrain: 0.4 Buchanan: 4.3 Caldwell: 3.1 Carroll: 3.3 Chariton: 4.1 Clinton: 1.4 Lincoln: 2.0 Montgomery: 1.9 Randolph: 3.6 St.Charles: 0	Audrain: 3.4 Buchanan: 0.2 Caldwell: 0 Carroll: 0.1 Chariton: 0 Clinton: 0 Lincoln: 8.2 Montgomery: 2.7 Randolph: 0 St.Charles: 0.6			Audrain: 890.2-927.4 Buchanan: 743.4-761.3, Caldwell: 788.9-804.8 Carroll: 810.1-835.3 Chariton: 836.3-866.7 Clinton: 766.4-784.3 Lincoln: 949.1-976.2 Montgomery: 934.0-948.7 Randolph: 869.6-889.1 St. Charles: 977.0-984.8, 991.2-991.3, 1016.6-1016.7
Bald eagle <i>Haliaeetus leucocephalus</i>	FT; MO-E	Breeding Season: 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	MDC defers to USFWS survey guidelines. USFWS suggests surveying one-mile upstream and one-mile downstream of major rivers or historical nest or winter roost sites crossed by project.	Buchanan Chariton Clinton Lincoln St.Charles					Buchanan: 0.2 (Missouri River) Chariton: 0.7 (Grand River, Chariton River, E. Fork of Little Chariton River) Clinton: Middle Fork Little Chariton River, East Fork Little Chariton River Lincoln: 0.2 (West Fort Cuivre River, Cuivre River) St. Charles: 0.3 (Mississippi River, Missouri River)	Buchanan: 743.4-743.6 (Missouri River) Chariton: 835.4-835.5 (Grand River), 857.2-857.3 (Chariton River), 862.9 (M.F. Little Chariton River), 866.5 (E.F. Little Chariton River) Lincoln: 950.8, 953.9, (W.F. Cuivre River) 967.3-967.4 (Cuivre River) St. Charles: 980.5-1016.6 (Missouri/Mississippi River Floodplain)
Barn owl <i>Tyto alba</i>	MO-E	Nesting Season: March thru June	One ground survey prior to any construction.	Visit any old buildings, barns that are in the path of the pipeline between March and June, and look for nesting birds in the upper portions of the structure. Best time to see birds is often just before dark, when adults are leaving to begin hunting. If birds/signs of birds (pellets, rodent bones, etc.) are present, preserve the structure if possible. If the structure must be destroyed, do it outside of the aforementioned nesting season, and provide alternative nesting structures using barn owl boxes in the area. Also preserve existing tracts of grasslands whenever possible.	Audrain Buchanan Caldwell Carroll Chariton Clinton Lincoln Montgomery Randolph St.Charles						Need to identify any old barns/structures within the ROW for all counties along route.
Greater prairie-chicken <i>Tympanuchus cupido</i>	MO-E	Mating Season: 15-March to 10-April	3 ground surveys prior to any construction	Conduct counts between 15 March and 10 April Survey each route/area 3 times Start surveys 15 minutes before sunrise to 1 hr after sunrise Run survey routes on clear, calm mornings Stop to listen every ½ mile and/or on high points Record data for all booming grounds detected Separate data for booming grounds within 1-mi survey zone and those "outside" zone All leks and birds within 1 mile of the route Need to contact affected landowners in Audrain County for GPC sightings. If no GPC have been sighted, no need to conduct surveys.	Audrain	Audrain: 5.9					Audrain: 890.3-926.7
King rail <i>Rallus elegans</i>	MO-E	Breeding Season: 1 April - 15 July	One ground survey prior to any construction.	See FWS protocol for monitoring marshbird species. Survey suitable wetlands/ bottomland habitats, especially along the Grand and Charion Rivers. Surveys may need to be conducted up to 9 times per site to gain enough confidence king rails are/are not present at site.	Buchanan Carroll Chariton Lincoln St.Charles				Data pending Data pending Data pending Data pending Data pending		Buchanan: data pending Carroll: data pending Chariton: data pending Lincoln: data pending St.Charles: data pending

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Northern harrier <i>Circus cyaneus</i>	MO-E	Breeding Season: June to early-July	One ground survey prior to any construction.	Survey tracts of grasslands, marshes, or other open, grassy habitats for presence of adults and/or nests/young between May and July, preferably June to early July (the birds tend to nest late), anytime during the day, although morning is probably the best time to see hunting birds. If birds are present, restrict project activities between the aforementioned nesting season, and preserve tracts of the aforementioned habitats whenever possible.	Audrain Buchanan Caldwell Carroll Chariton Clinton Randolph	Audrain: 5.9 Buchanan: 0.2 Caldwell: 9.9 Carroll: 13.0 Chariton: 12.9 Clinton: 11.9 Randolph: 9.2				Data pending Data pending Data pending Data pending Data pending	Audrain: 890.3-926.7; data pending Buchanan: 750.5-750.7; data pending Caldwell: 786.3-805.3; data pending Carroll: 810.7-834.7; data pending Chariton: 842.2-866.3; data pending Clinton: 764.3-784.1; data pending Randolph: 867.9-888.7; data pending	
Topeka shiner <i>Notropis topeka</i>	FE; MO-E	Spawning Season: 15-May to 31-July	One survey to evaluate T. shiner habitat at proposed stream crossings	ENSR aquatic biologist, MDC aquatic biologist, and Project Engineer to visit T. shiner stream crossings to evaluate the habitat and discuss crossing methods and mitigation. MDC indicated the HDD is preferred method for pipeline construction across all streams where T&E species occur.	Clinton Caldwell Randolph					Clinton: 0.3 (Castile Creek, Little Platte River, Shoal Creek) Caldwell: 0.3 (Log Creek, Brush Creek, Crabapple Creek) Chariton: 0.2 (East Fork Chariton River including Silver Creek and tributaries to the west) Randolph: headwaters to Perche Creek in east Chariton and Randolph County	Clinton: 767.7, 769.1, 770.0 (Castile Creek), 775.7, 776.6 (Little Platte River), 780.4, 781.2 (Shoal Creek) Caldwell: 789.3, 790.3, 791.1 (Log Creek), 796.1, 796.5 (Brush Creek), 799.3, 799.5 (Crabapple Creek) Chariton: 866.5 (East Fork Chariton River) Randolph: N/A Note: Route doesn't cross Silver Creek or any tribs to Silver Creek, and route doesn't appear to cross any tributaries to Perche Creek	
Massasauga <i>Sistrurus catenatus</i>	FC; MO-E	Active Period: April, May, June, October	One ground survey prior to any construction.	Massasauga is mainly associated with wet prairies. Active from early April through late October. Peak capture months are in spring (early April, May and early June) and autumn (September and October). Snakes move very little in the heat of the summer months (July, Aug, early Sept). In early spring and autumn snakes are most often captured between 1000 and 1600, but in summer, 1600 to 2000 is the period of greatest movement. Survey all suitable wetland habitat within the ROW, especially Grand River wetlands complex/ crossing vicinity.	Buchanan Carroll Chariton St.Charles					Data pending Data pending Data pending	Buchanan: 0.2 (Missouri River, Muskrat Lake, Horseshoe Lake) Carroll: 0 Chariton: 0.7 (Grand River, Chariton River, E. Fork of Little Chariton River, Mussel Fork Brush Creek, Middle Fork Little Chariton River, East Fork Little Chariton River) St. Charles: 0.3 (Missouri River, Mississippi River)	Buchanan: 743.4-743.6 (Missouri River), 745.2-745.8 (Muskrat Lake), 745.0-745.7 (Horseshoe Lake); data pending Carroll: data pending Chariton: 835.4-836.0 (Grand River), 852.4-852.5 (Mussel Fork Brush Creek), 857.2-857.3 (Chariton River), 862.8-863.2 (M.F. Little Chariton), 866.5-866.7 (E.F. Little Chariton); data pending St. Charles: 980.5-1016.6 (Missouri/Mississippi River Floodplain); data pending
Western fox snake <i>Elaphe vulpina vulpina</i>	MO-E	April, May, June, October	One ground survey prior to any construction.	See protocol for massasauga. Can be conducted concurrently with massasauga surveys	Buchanan Carroll Chariton St.Charles					Data pending Data pending Data pending	Buchanan: 0.2 (Missouri River, Muskrat Lake, Horseshoe Lake) Carroll: 0 Chariton: 0.7 (Grand River, Chariton River, E. Fork of Little Chariton River, Mussel Fork Brush Creek, Middle Fork Little Chariton River, East Fork Little Chariton River) St. Charles: 0.3 (Missouri River, Mississippi River)	Buchanan: 743.4-743.6 (Missouri River), 745.2-745.8 (Muskrat Lake), 745.0-745.7 (Horseshoe Lake); data pending Carroll: data pending Chariton: 835.4-835.5 (Grand River), 852.4-852.5 (Mussel Fork Brush Creek), 857.2-857.3 (Chariton River), 862.8-863.2 (M.F. Little Chariton), 866.5-866.7 (E.F. Little Chariton); data pending St. Charles: 980.5-1016.6 (Missouri/Mississippi River Floodplain); data pending
Decurrent false aster <i>Boltonia decurrens</i>	FT; MO-E	Flowering Period: Aug & Sept	One ground survey prior to any construction.	Most likely Missouri occurrence would be in Mississippi River/Missouri River floodplain in the eastern half of St. Charles Co. Flowering probable from late August through Sept. but has been documented from July through October. Found in low areas subject to periodic flooding. This could include agricultural fields; ruderal sites; roadside ditches; base of levees near standing water; sloughs; pond margins; wet prairies; edges of, or openings within, floodplain forests. Surveys in eastern part of St. Charles County along floodplains of Missouri and Mississippi rivers. Also survey along flooded fields and farmed wetlands within ROW.	St.Charles					Data pending	St.Charles: 977.0-991.3, 1016.6-1016.7; data pending	

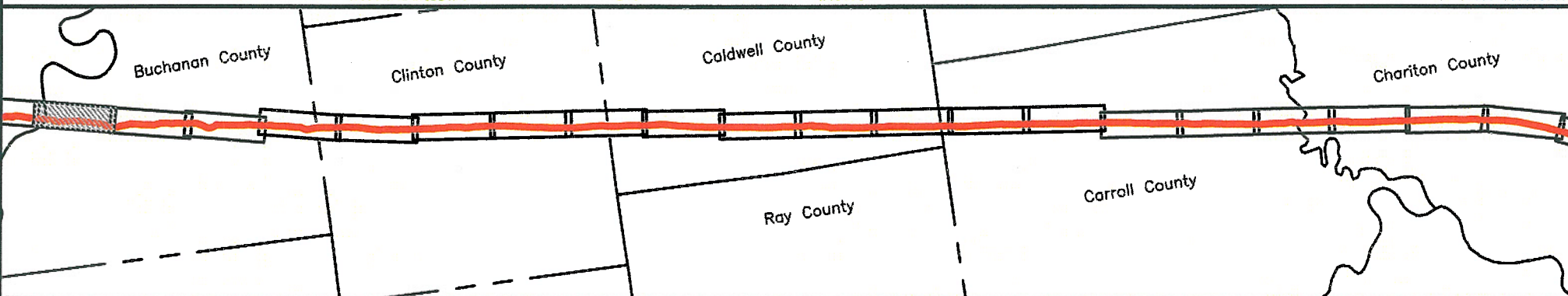
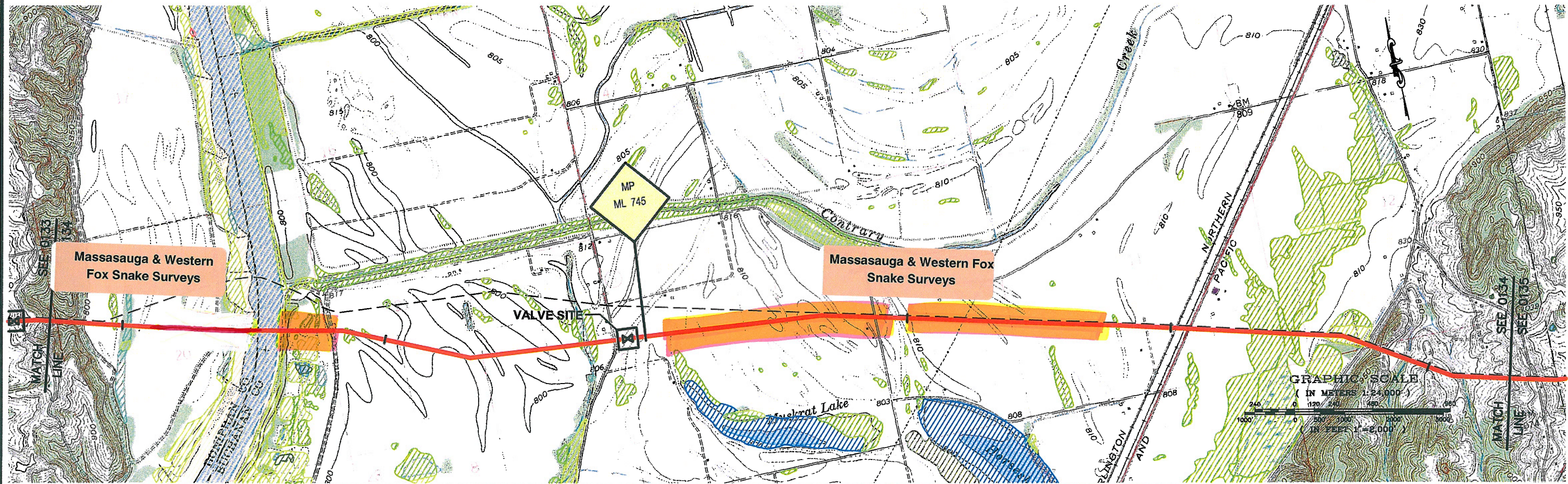
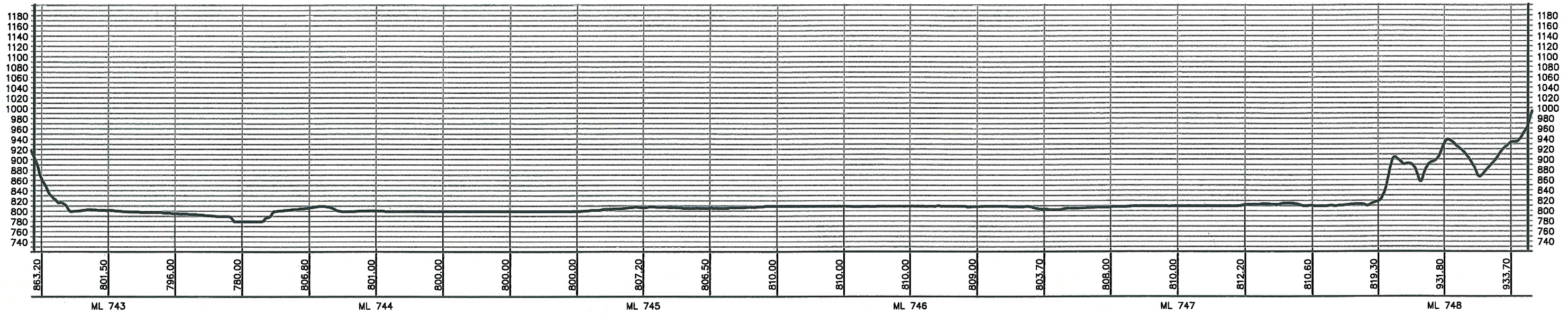
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Running buffalo clover <i>Trifolium stoloniferum</i>	FE; MO-E	Flowering Period: May thru June	One ground survey prior to any construction.	Most likely occurrence would be on first terraces above banks of larger streams or rivers. Flower heads would normally be present in May but can also be found from mid-April to June. Fruiting heads may persist into July. The species grows best in partial sun under a high canopy or in small canopy gaps or near edges of riparian forests. It can occur in mowed areas such as lawns, picnic areas or other somewhat shaded sites. Periodic disturbance from flooding, game trail usage, logging, grazing or mowing can benefit the plant by reducing competition and providing exposed soil where stolons can root.	Buchanan Chariton Lincoln Randolph St.Charles					Buchanan: 0.2 (Missouri River) Chariton: 0.7 (Grand River, Chariton River, E. Fork of Little Chariton River) Lincoln: 0.2 (West Fort Cuivre River, Cuivre River) Randolph: Middle Fork Little Chariton River, East Fork Little Chariton River St. Charles: 0.3 (Mississippi River, Missouri River)	Buchanan: 743.4-743.6 (Missouri River) Chariton: 835.4-835.5 (Grand River), 857.2-857.3 (Chariton River), 862.9 (M.F. Little Chariton River), 866.5 (E.F. Little Chariton River) Lincoln: 950.3 (W.F. Cuivre River), 967.3-967.4 (Cuivre River) Randolph: 862.86 (Middle Fork Little Chariton River) 866.50 (East Fork Little Chariton River) St. Charles: 980.5-1016.6 (Missouri/Mississippi River Floodplain)

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

ELEVATIONS SHOWN IN FEET - VERTICAL = 10x HORIZONTAL



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

ISSUED FOR DEPARTMENT OF STATE FILING	MAR.13.06
DRAWING NUMBER	K-29-P-900-A-0001
DRAWN BY	AH
CHECKED BY	BLS
APPROVED BY	RG

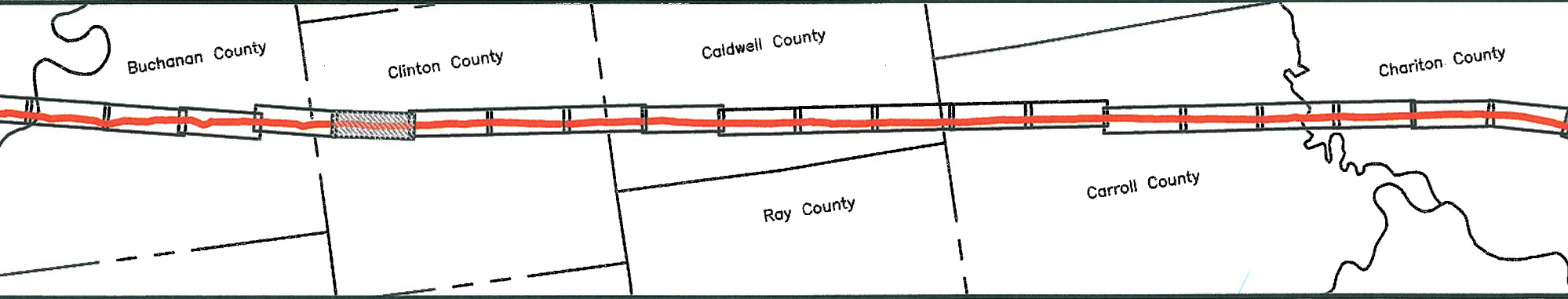
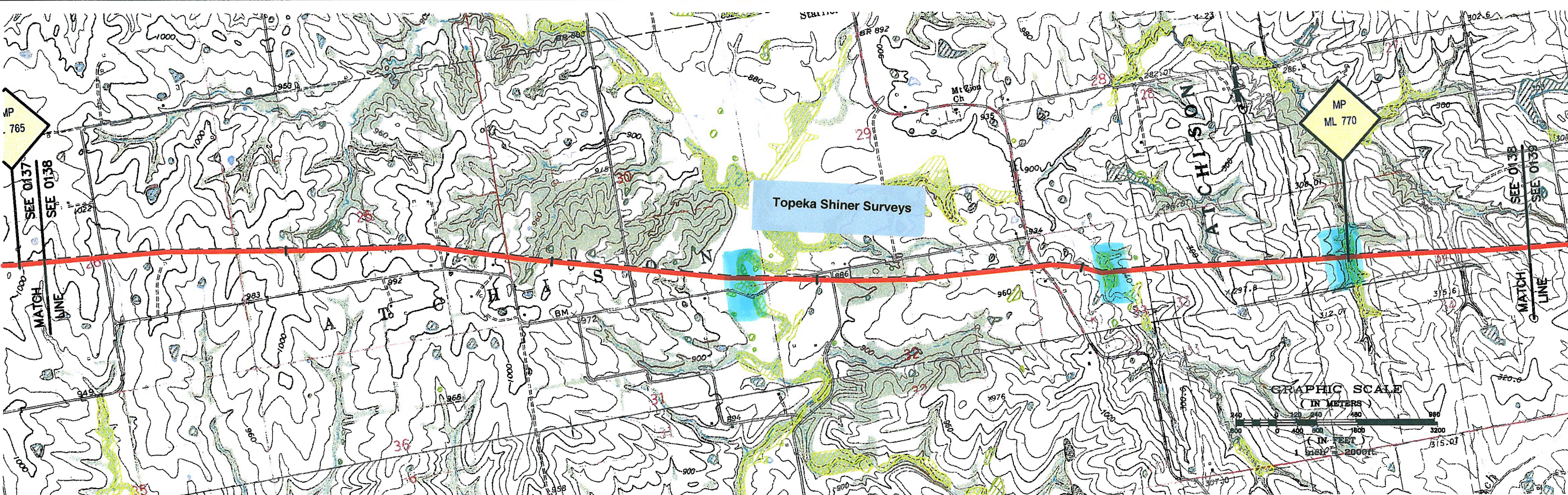
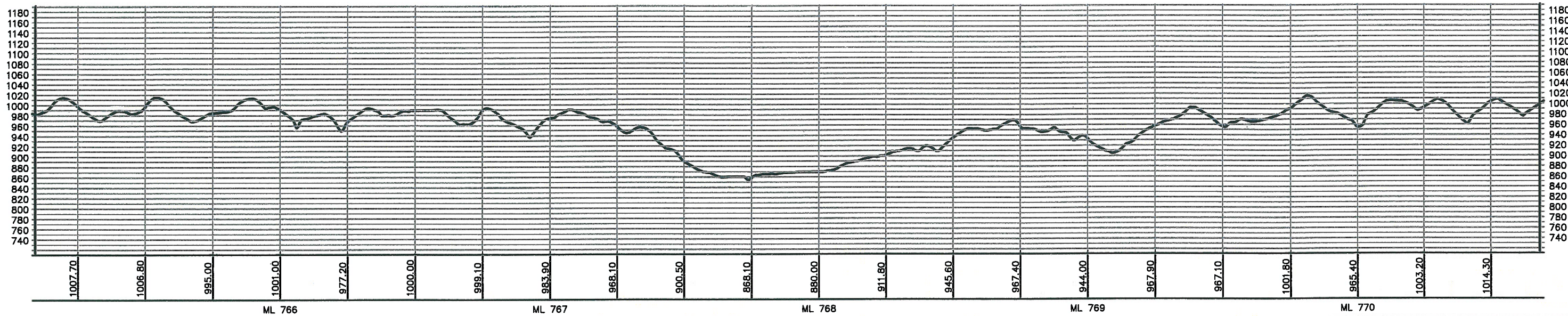
TransCanada
In business to deliver

**KEYSTONE PIPELINE PROJECT
PROPOSED ROUTE BOOK**

MAP PARAMETERS
PROJECTION: NAD83, UTM: 15N
SCALE: 1:24,000; 1" = 2,000'

PROJECT: 50388E	SHEET: 0134
LAST PLOT DATE: Sun, 19 Mar 2006 - 5:16pm	

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 PROPOSED ROUTE BOOK**

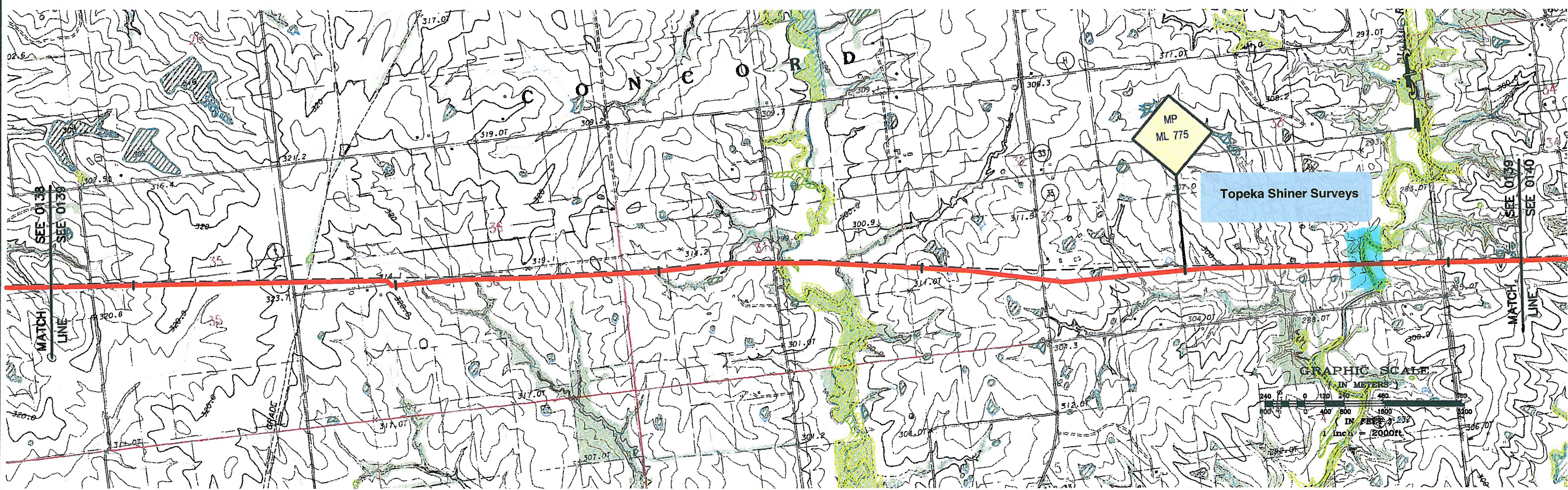
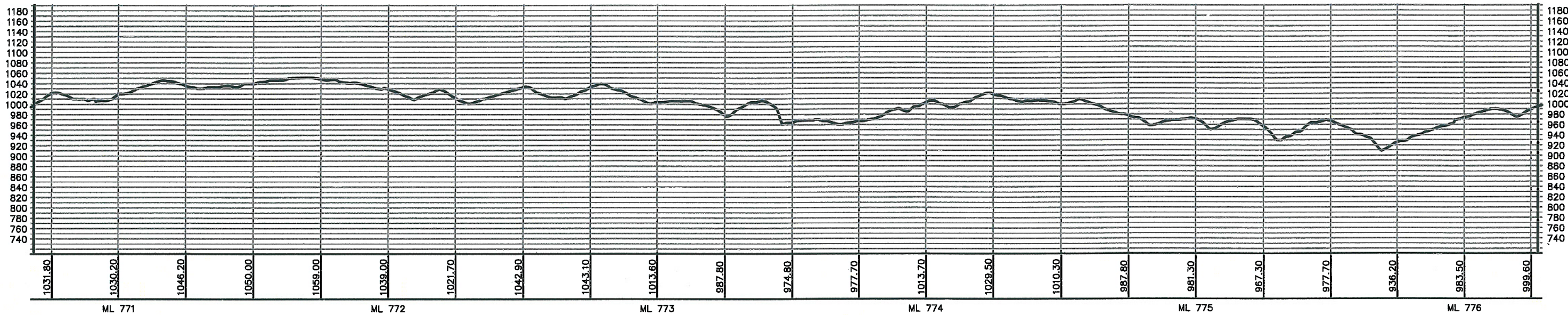
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 PROJECTION: NAD83, UTM: 15N
 SCALE: 1:24,000; 1" = 2,000'

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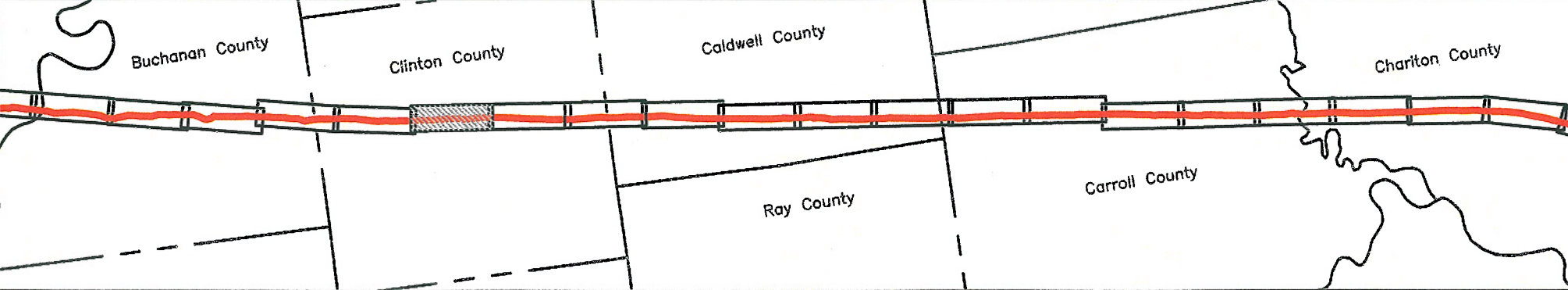
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ELEVATIONS SHOWN IN FEET - VERTICAL = 10x HORIZONTAL



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0	ISSUED FOR DEPARTMENT OF STATE FILING	MAR.13.06
DRAWING NUMBER		DRAWN BY
K-29-P-900-A-0006		AH
CHECKED BY		APPROVED BY
BLS		RG

**KEYSTONE PIPELINE PROJECT
 PROPOSED ROUTE BOOK**

MAP PARAMETERS
 PROJECTION: NAD83, UTM: 15N
 SCALE: 1:24,000; 1" = 2,000'

PROJECT:	50388E
SHEET:	0139
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