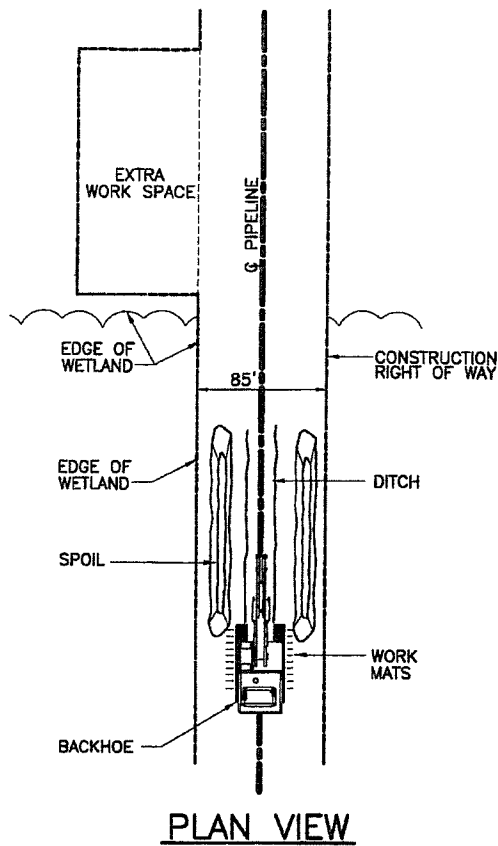


CONSTRUCTION PROCEDURES:

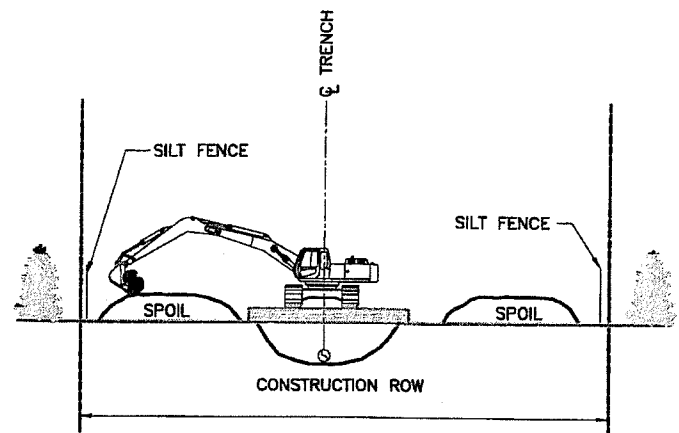
1. FLAG WETLAND BOUNDARIES PRIOR TO CLEARING.
2. NO REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER KEYSTONE'S SPILL PREVENTION PROCEDURES.
3. INSTALL TEMPORARY SLOPE BREAKER UPSLOPE WITHIN 100 FEET OF WETLAND BOUNDARY IF DIRECTED BY KEYSTONE.
4. INSTALL TIMBER MATS/RIP-RAP THROUGH ENTIRE WETLAND AREA. EQUIPMENT NECESSARY FOR RIGHT-OF-WAY CLEARING MAY MAKE ONE (1) PASS THROUGH THE WETLAND BEFORE MATS ARE INSTALLED.
5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS (STRAW BALES AND/OR SILT FENCE) AT DOWN SLOPE EDGE OF RIGHT-OF-WAY AND ALONG WETLAND EDGE AS REQUIRED.
6. RESTRICT ROOT GRUBBING TO ONLY THAT AREA OVER THE DITCHLINE AND DITCH SPOIL AREAS AND REMOVE FROM WETLAND FOR DISPOSAL.
7. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
8. LEAVE HARD PLUGS AT THE EDGE OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
9. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND AND ADJACENT TO ALIGNMENT, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN.
10. TRENCH THROUGH WETLANDS.
11. LOWER-IN PIPE, INSTALL TRENCH PLUGS AT WETLAND EDGES AS REQUIRED AND BACKFILL IMMEDIATELY.
12. REMOVE TIMBER MATS OR PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
13. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL PERMANENT EROSION CONTROL.

12/13/2005 12:00:14 PM EST
 TROW ENGINEERING CONSULTANTS, INC. 1300 METROPOLITAN BOULEVARD, SUITE 200 TALLAHASSEE, FLORIDA 32308
 PHONE: 1-850-385-6441 FAX: 1-850-385-5523
 KEYSTONE PIPELINE PROJECT

PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-6441 Fax: 1-850-385-5523			 Trow	 TransCanada <i>in business to deliver</i> KEYSTONE PIPELINE PROJECT														
<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> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			NO.	REVISION	DATE													STANDARD WETLAND CROSSING METHOD
NO.	REVISION	DATE																
PROJECT: 50388E		DETAIL 9																
ISSUED FOR DEPARTMENT OF STATE FILING MAR. 19, 2006		APPROVED BY:																
DRAWING NUMBER: K-00-P-7000-300	DRAWN BY: ALS	CHECKED BY: JTG	APPROVED BY: RG															
LAST PLOT DATE:			Mar. 13 Mar 2006 - 4:02pm															



PLAN VIEW



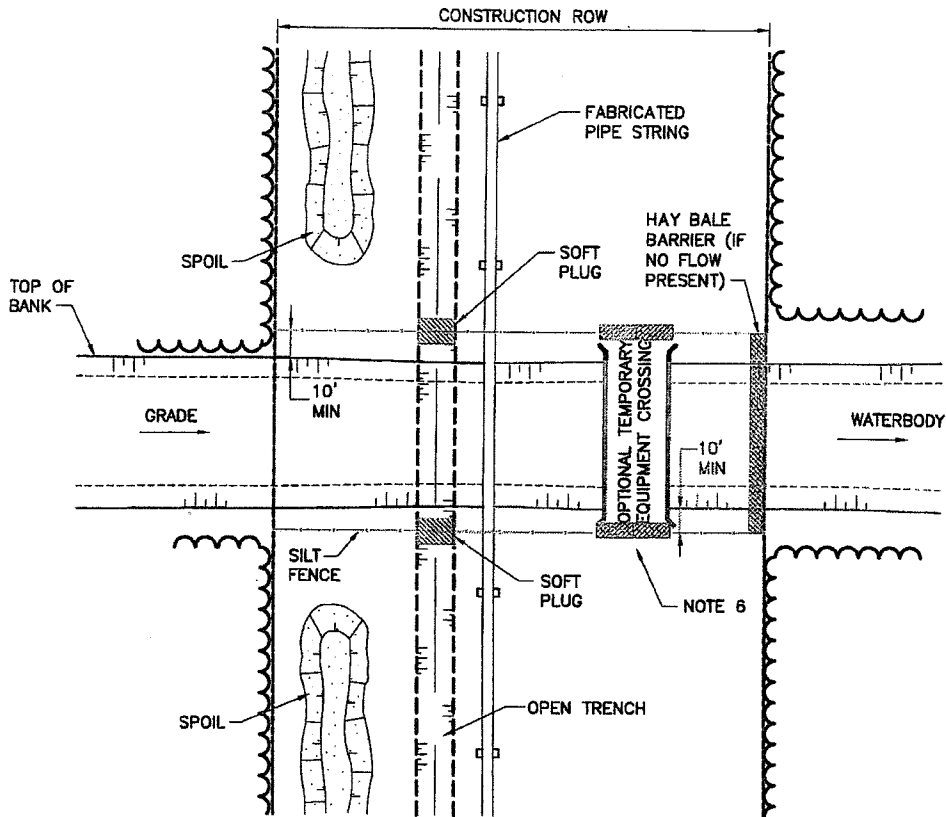
SECTION "A-A"

CONSTRUCTION PROCEDURES:

1. FLAG WETLAND BOUNDARIES PRIOR TO CLEARING.
2. NO REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER KEYSTONE'S SPILL PREVENTION PROCEDURES.
3. INSTALL TEMPORARY SLOPE BREAKER UPSLOPE WITHIN 100 FEET OF WETLAND BOUNDARY AS DIRECTED BY KEYSTONE.
4. RESTRICT ROOT GRUBBING TO ONLY THE AREA OVER THE DITCHLINE.
5. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
6. UTILIZE AMPHIBIOUS EXCAVATORS (PONTOON MOUNTED BACKHOES) OR TRACKED BACKHOES SUPPORTED BY FABRICATED TIMBER MATS OR FLOATS TO EXCAVATE TRENCH. IF FABRICATED TIMBER MATS ARE USED FOR STABILIZATION, THE BACKHOE SHALL GRADUALLY MOVE ACROSS THE WETLAND BY MOVING THE MAT FROM IMMEDIATELY BEHIND TO IMMEDIATELY IN FRONT OF THE BACKHOE'S PATH.
7. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS (STRAW BALES AND/OR SILT FENCE) AT EDGE OF RIGHT-OF-WAY AND ALONG WETLAND EDGE IF PRACTICAL.
8. FABRICATE PIPE IN STAGING AREA OUTSIDE THE WETLAND IN THE EXTRA WORK SPACE AS INDICATED ON THE CONSTRUCTION DRAWINGS.
9. LEAVE HARD PLUGS AT THE EDGE OF THE WETLAND UNTIL JUST PRIOR TO PIPE PLACEMENT.
10. FLOAT PIPE IN PLACE, LOWER-IN, INSTALL TRENCH PLUGS AT WETLAND EDGES WHERE REQUIRED AND BACKFILL IMMEDIATELY.
11. REMOVE TIMBER MATS OR PREFABRICATED MATS OF NON-NATIVE MATERIAL FROM WETLANDS UPON COMPLETION.
12. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL.

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PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-6441 Fax: 1-850-385-6323			 Trow	 TransCanada <i>In Business to deliver</i>
			KEYSTONE PIPELINE PROJECT	
			PUSH/PULL WETLAND CROSSING METHOD	
NO. REVISION DATE		PROJECT: 50388E		
0 ISSUED FOR DEPARTMENT OF STATE FILING		DATE: 10/20/05		
DRAWING NUMBER: K-00-P-7000-300		APPROVED BY: RG		
DRAWN BY: ALS		CHECKED BY: JTG		
		LAST PLOT DATE: 12/17/05 12:00:14 PM EST		



PLAN VIEW

CONSTRUCTION PROCEDURES:

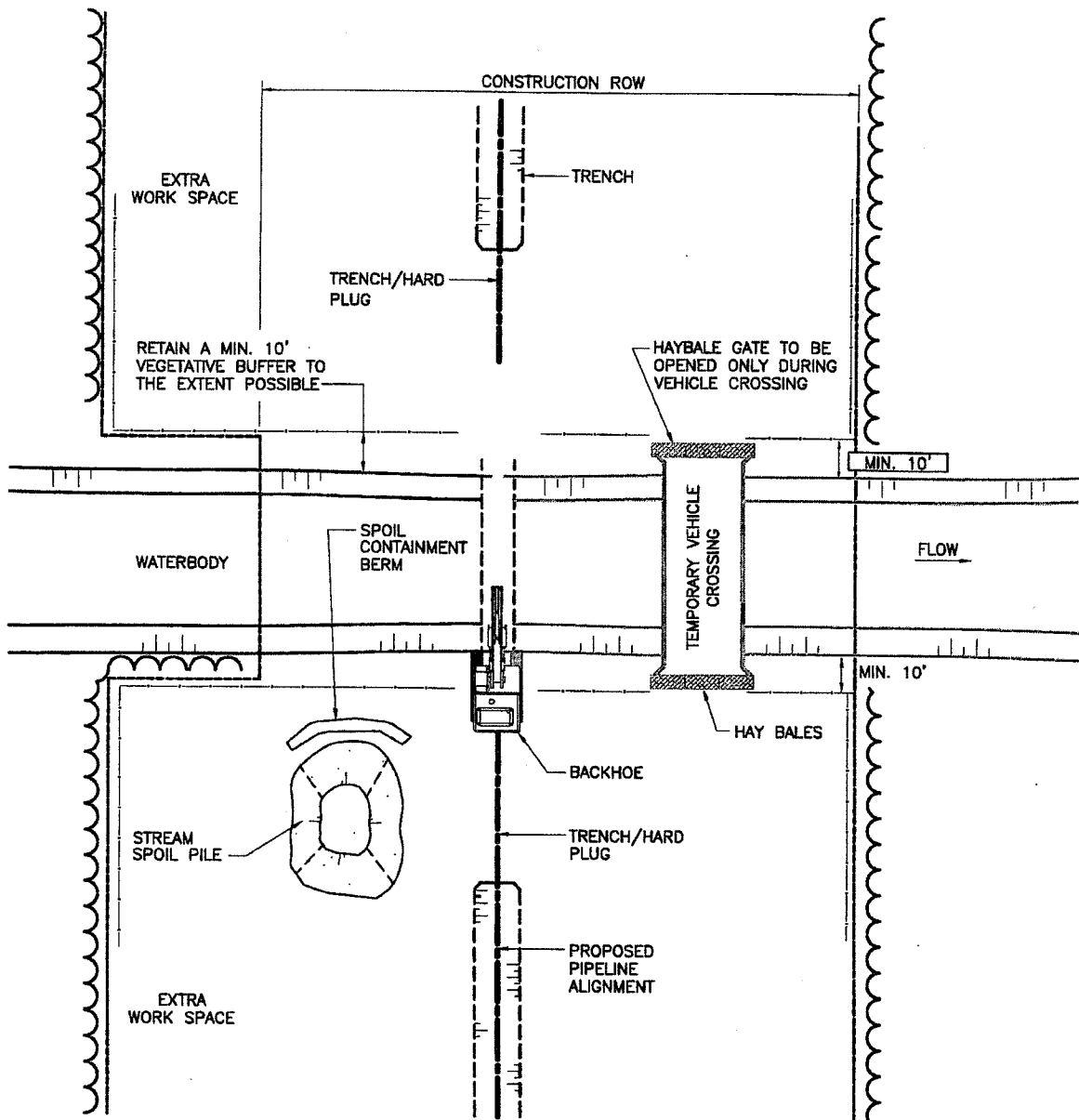
1. METHOD APPLIES TO CROSSINGS WHERE NO FLOWING WATER IS PRESENT AT THE TIME OF CROSSING.
2. CONTRACTOR MAY "MAINLINE THROUGH" THE CROSSING OR UP TO BOTH SIDES OF THE CROSSING; STRING, WELD, COAT AND WEIGHT (IF NECESSARY), USING THE MAINLINE CREW WITH THE PIPE SKIDDED OVER THE CROSSING.
3. NO REFUELING OF MOBILE EQUIPMENT WITHIN 100 FEET OF DRY CHANNEL. REFUEL STATIONARY EQUIPMENT AS PER KEYSTONE'S SPILL PREVENTION PROCEDURES.
4. INSTALLATION OF TEMPORARY EQUIPMENT CROSSING IS OPTIONAL AT THE DISCRETION OF KEYSTONE.
5. IN AGRICULTURAL LAND, STRIP TOPSOIL FROM SPOIL STORAGE AREA. STOCKPILE TOPSOIL AND SPOIL SEPARATELY. TOPSOIL AND SPOIL WILL NOT BE STOCKPILED IN THE CROSSING CHANNEL AND WILL BE PLACED A MINIMUM OF 10 FEET FROM CROSSING BANKS WITHIN THE CONSTRUCTION RIGHT OF WAY.
6. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION RIGHT OF WAY FOLLOWING CLEARING AND GRADING AND MAINTAIN UNTIL CONSTRUCTION OF THE CROSSING. EROSION CONTROL MEASURES SHALL BE REINSTALLED IMMEDIATELY FOLLOWING BACKFILLING OF TRENCH AND STABILIZATION OF BANKS. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
7. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL A MINIMUM OF 10 FEET FROM HIGH BANK AND WITHIN THE CONSTRUCTION RIGHT OF WAY.
8. BACKFILL WITH NATIVE MATERIAL.
9. RESTORE CROSSING CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.
10. RESTORE CROSSING BANKS TO APPROXIMATE ORIGINAL CONDITION AND STABILIZE WITH EROSION CONTROL.

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PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-8441 Fax: 1-850-385-9323		 Trow	 TransCanada <i>in business to deliver</i> KEYSTONE PIPELINE PROJECT															
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NO.	REVISION	DATE																
ISSUED FOR DEPARTMENT OF STATE FILING MARK 10.2008		PROJECT: 50388E																
DRAWING NUMBER: K-00-P-7000-300		APPROVED BY: RG																
DRAWN BY: ALS		CHECKED BY: JTG																
LAST PLOT DATE: Mon, 13 Mar 2008 - 4:58pm																		
DETAIL 11																		

SEE DETAIL 12a FOR
CONSTRUCTION PROCEDURE

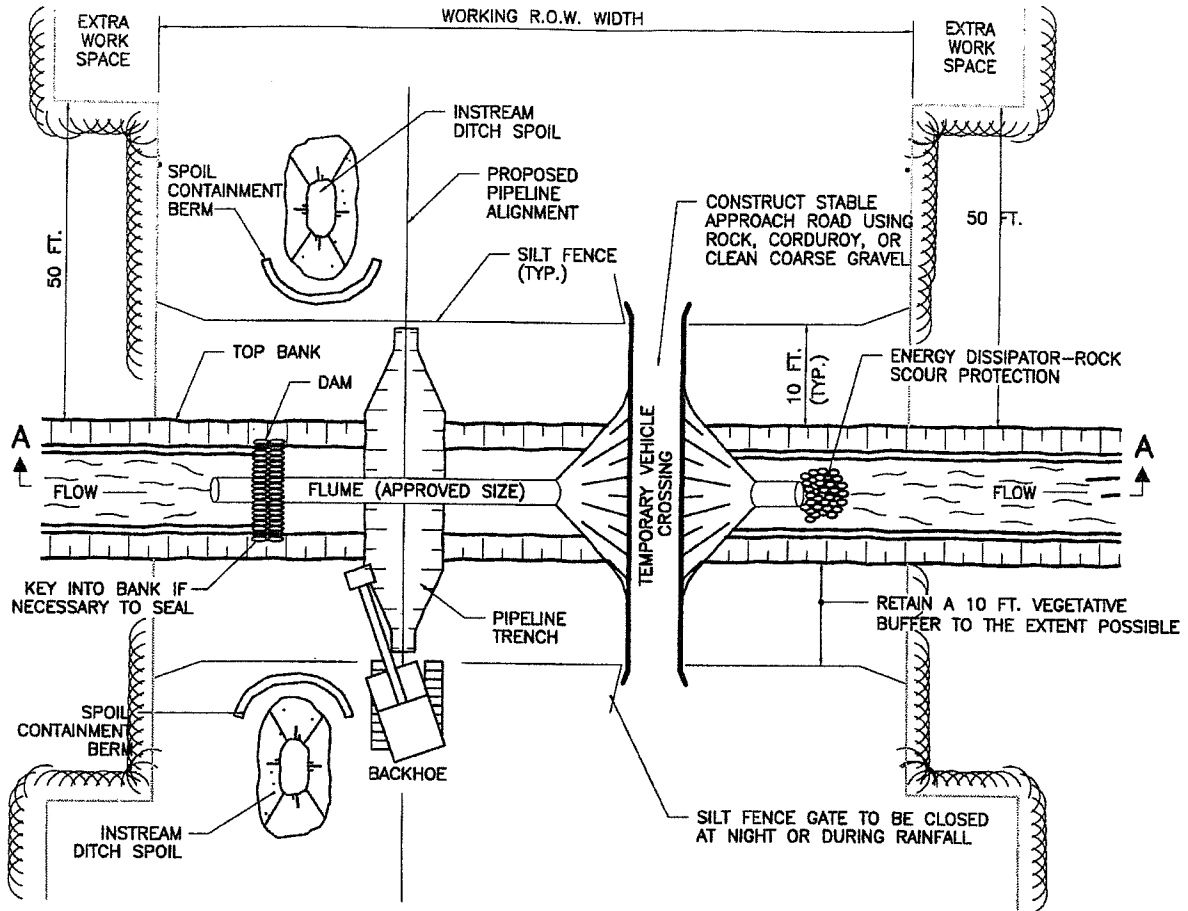


PLAN VIEW

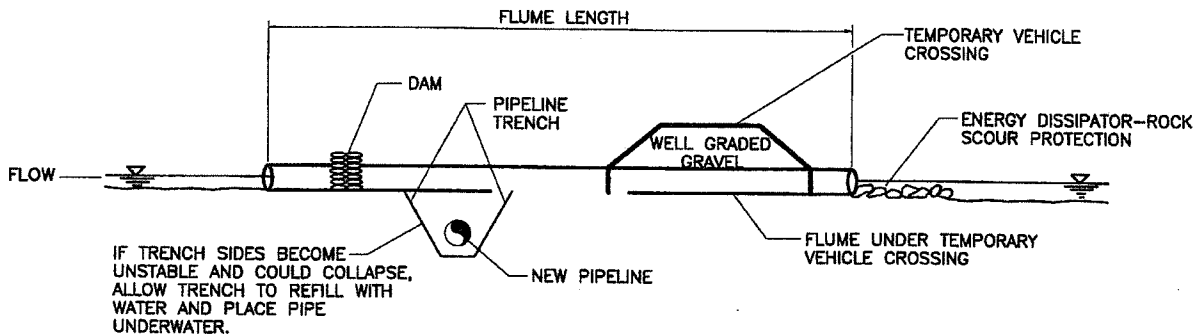
PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-6441 Fax: 1-850-385-6523			 Trow	 TransCanada <i>In business to deliver</i>															
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;"> ISSUED FOR DEPARTMENT OF STATE PLUMBING MAR. 10.2008 </td> <td style="width: 50%; padding: 2px;"> PROJECT: 50388E </td> </tr> </table>			ISSUED FOR DEPARTMENT OF STATE PLUMBING MAR. 10.2008	PROJECT: 50388E	TYPICAL FLOWING WATERBODY CROSSING METHOD														
ISSUED FOR DEPARTMENT OF STATE PLUMBING MAR. 10.2008	PROJECT: 50388E																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">DRAWING NUMBER</th> <th style="width: 25%;">DRAWN BY</th> <th style="width: 25%;">CHECKED BY</th> <th style="width: 25%;">APPROVED BY</th> </tr> <tr> <td style="text-align: center;">K-00-P-7000-300</td> <td style="text-align: center;">ALS</td> <td style="text-align: center;">JTG</td> <td style="text-align: center;">RG</td> </tr> </table>			DRAWING NUMBER	DRAWN BY	CHECKED BY	APPROVED BY	K-00-P-7000-300	ALS	JTG	RG	DETAIL 12								
DRAWING NUMBER	DRAWN BY	CHECKED BY	APPROVED BY																
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LAST PLOT DATE: Mar. 13 Mar 2008 - 4:28pm																			

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PLAN VIEW



SECTION 'A-A'

- NOTES:**
1. PIPELINE PLACEMENT WITHIN RIGHT-OF-WAY CONCEPTUAL ONLY.
 2. SEE DETAIL 13a FOR CONSTRUCTION PROCEDURES.

PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1500 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-6441 Fax: 1-850-385-5523			 Trow	 TransCanada <i>in business to deliver</i> KEYSTONE PIPELINE PROJECT											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: 8px;">NO.</th> <th style="font-size: 8px;">REVISION</th> <th style="font-size: 8px;">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										TYPICAL DRY FLUME CROSSING METHOD		
NO.	REVISION	DATE													
PROJECT: 5038BE	DETAIL 13														
DRAWING NUMBER: K-00-P-7000-300	DRAWN BY: ALS	CHECKED BY: JTG	APPROVED BY: RG	PROJECT: 5038BE											
ISSUED FOR DEPARTMENT OF STATE PL/1G MAR 10 2005			LAST PLOT DATE: Mon, 13 Mar 2005 - 4:50pm												



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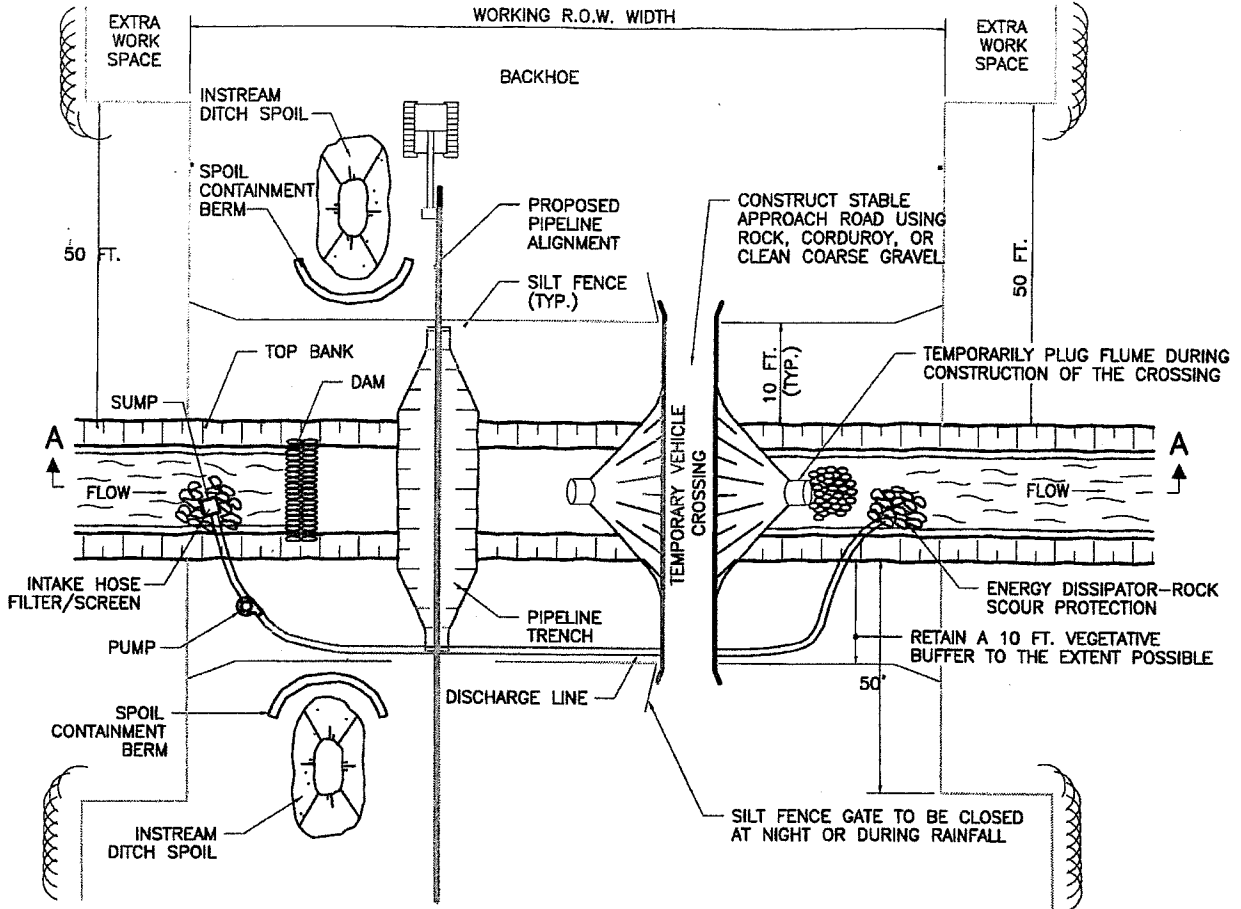
CONSTRUCTION PROCEDURES:

1. MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURES NEEDED TO PROTECT WATER QUALITY.
2. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE FLUME MUST BE ON SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER WORK.
3. TO THE EXTENT POSSIBLE, MAINTAIN A MINIMUM 10 FT. VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SILT FENCE OR STRAW BALE BARRIER UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE.
4. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED OR ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS STREAM.
 - a. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY OR INDIRECTLY INTO THE STREAM.
 - b. EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS.
 - c. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION. UTILIZE STRAW BALE BARRIERS ONLY IN LIEU OF A SILT FENCE WHERE FREQUENT ACCESS IS REQUIRED.
 - d. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
 - e. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED PORTIONS OF THE RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
 - f. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
5. PIPE SHALL BE STRUNG AND WELDED FOR READY INSTALLATION PRIOR TO WATERCOURSE TRENCHING.
6. FLUME CAPACITY DURING DRY CROSSING SHALL BE SUFFICIENT TO ACCOMMODATE 1.5 TIMES THE FLOW MEASURED AT THE TIME OF CONSTRUCTION PROVIDED THAT THE FLUMES WILL BE IN PLACE NOT MORE THAN 96 HOURS AND NO PRECIPITATION IS FORECAST. FLUME CAPACITY FOR VEHICLE ACCESS SHALL BE SUFFICIENT TO PASS THE 2 YEAR DESIGN FLOW OR THE FLOW REASONABLY EXPECTED TO OCCUR DURING THE INSTALLATION. EXCESS FLUMES REQUIRED FOR LONGER TERM ACCESS SHALL BE CAPPED DURING DRY CROSSING PROCEDURES.
7. ENSURE THAT THE DAMS AND VEHICLE-CROSSING ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION. FLUMES ARE TO BE SET WITH 10 PERCENT OF THEIR DIAMETER BELOW STREAMBED LEVEL WHERE SOIL CONDITIONS PERMIT (OTHERWISE INSTALLED AT STREAM GRADE AND SLOPE).
8. PLACE IMPERVIOUS DAMS AT EACH END OF THE FLUME. UPSTREAM FIRST, THEN DOWNSTREAM. ACCEPTABLE ALTERNATIVES INCLUDE GRAVEL WITH RIP-RAP PROTECTION, SAND BAGS, STEEL PLATE AND ROCKFILL. DURING INSTALLATION, INSTALL AN IMPERVIOUS MEMBRANE, IF NECESSARY, TO LIMIT LEAKAGE. DAMS MAY NEED KEYING INTO THE BANK AND STREAMBED.
9. EXCAVATE TRENCH THROUGH PLUGS AND UNDER FLUME FROM BOTH SIDES. WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE.
 - a. LOWER IN PIPE BY PASSING UNDER FLUME AND BACKFILL IMMEDIATELY WITH SPOIL MATERIAL.
 - b. IT IS NOT NECESSARY TO DEWATER THE IN-STREAM TRENCH, HOWEVER, DISPLACED WATER SHALL BE PUMPED TO A STABLE UPLAND AREA TO AVOID OVERTOPPING OF DAMS DURING PIPE PLACEMENT.
 - c. IF THE SPOIL MATERIAL IS NOT SUITABLE, USE IMPORTED CLEAN GRANULAR MATERIAL.
 - d. IF BLASTING IS REQUIRED, USE CONTROLLED BLASTING TECHNIQUES TO PREVENT DAMAGE TO THE FLOW CONVEYANCE SYSTEM. ALTERNATIVELY, BLASTING MAY BE ACCOMPLISHED PRIOR TO FLUME INSTALLATION BY DRILLING THROUGH THE OVERBURDEN.
10. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 10 FT. OF THE WATERCOURSE. THIS MATERIAL MUST BE CONTAINED WITHIN BERM CONTAINMENT, WITH SECONDARY SILT FENCE PROTECTION TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE.
11. DEWATERING OF THE ONLAND TRENCH SHOULD OCCUR IN A STABLE VEGETATED AREA A MINIMUM OF 50 FT. FROM ANY WATERBODY. THE PUMP DISCHARGE SHOULD BE DIRECTED ONTO A STABLE SPILL PAD CONSTRUCTED OF ROCKFILL OR TIMBERS TO PREVENT LOCALIZED EROSION. THE DISCHARGE WATER SHOULD ALSO BE FORCED INTO SHEET FLOW IMMEDIATELY BEYOND THE SPILL PAD BY USING STRAW BALES AND THE NATURAL TOPOGRAPHY.
12. FLUMES SHOULD BE REMOVED AS SOON AS POSSIBLE, WHEN NO LONGER REQUIRED FOR PIPE LAYING OR FOR ROAD ACCESS, IN THE FOLLOWING MANNER:
 - a. REMOVE THE VEHICLE CROSSING RAMP. BANKS ARE TO BE RESTORED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH THE FLOW CONDITIONS (E.G., EROSION CONTROL BLANKETS, CRIBBING, ROCK RIP-RAP, ETC.) TO THE MAXIMUM EXTENT POSSIBLE BEFORE REMOVING THE DAMS.
 - b. REMOVE DOWNSTREAM DAM.
 - c. REMOVE UPSTREAM DAM.
 - d. REMOVE FLUME.
 - e. COMPLETE BANK TRIMMING AND EROSION PROTECTION. IF SANDBAGS ARE USED FOR THE DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS.
13. RESTORE THE STREAM BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, BUT NOT TO EXCEED 2 HORIZONTAL TO 1 VERTICAL.
 - a. INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED ON A SITE SPECIFIC BASIS. IN THE ABSENCE OF SITE SPECIFIC INFORMATION, A FLEXIBLE CHANNEL LINER SUCH AS HAG C125 OR C350 WHICH IS CAPABLE OF WITHSTANDING ANTICIPATED FLOW SHALL BE INSTALLED. ALTERNATIVELY, ROCK RIP-RAP SHALL BE INSTALLED.
 - b. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING.
 - c. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATER COURSE UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.

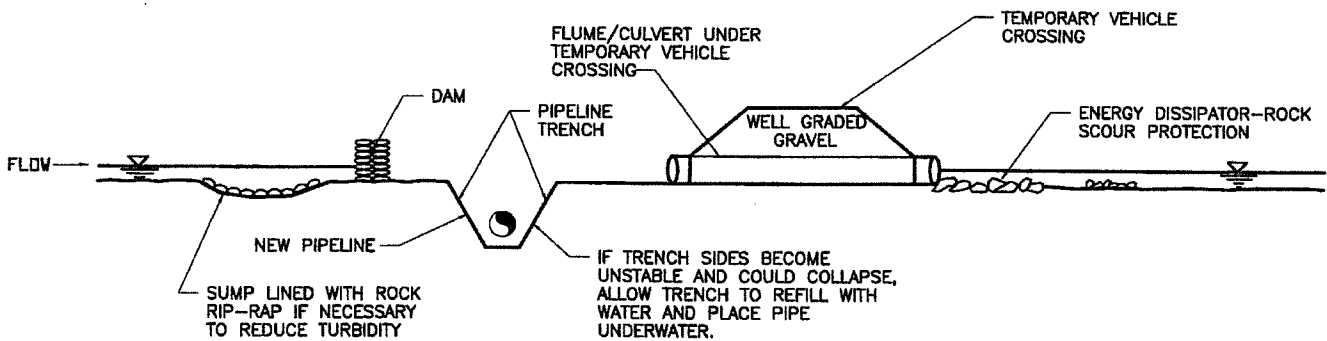
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PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1308 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-5441 Fax: 1-850-385-4523		 Trow	 TransCanada <i>in business to deliver</i>															
<table border="1" style="width: 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> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		NO.	REVISION	DATE													KEYSTONE PIPELINE PROJECT	
NO.	REVISION	DATE																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;"> PROJECT: 50388E </td> <td style="width: 50%; padding: 2px;"> DETAIL 13a </td> </tr> </table>		PROJECT: 50388E	DETAIL 13a	TYPICAL DRY FLUME CROSSING METHOD														
PROJECT: 50388E	DETAIL 13a																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; padding: 2px;"> DRAWING NUMBER K-00-P-7000-300 </td> <td style="width: 25%; padding: 2px;"> DRAWN BY ALS </td> <td style="width: 25%; padding: 2px;"> CHECKED BY JTG </td> <td style="width: 25%; padding: 2px;"> APPROVED BY RG </td> </tr> </table>		DRAWING NUMBER K-00-P-7000-300	DRAWN BY ALS	CHECKED BY JTG	APPROVED BY RG	LATEST PLOT DATE: MAR 16 2006												
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PLAN VIEW



SECTION 'A-A'

NOTES:

1. PIPELINE PLACEMENT WITHIN RIGHT-OF-WAY CONCEPTUAL ONLY.
2. SEE DETAIL 14c FOR CONSTRUCTION PROCEDURE

PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1369 Metropolitan Boulevard, Suite 208 Tallahassee, Florida 32308 Phone: 1-850-383-5441 Fax: 1-850-383-0323			 Trow	 TransCanada <i>in business to deliver</i> KEYSTONE PIPELINE PROJECT
NO.	REVISION	DATE		
PROJECT: 50388E ISSUED FOR DEPARTMENT OF STATE FILING MAR. 10. 2008			TYPICAL DAM AND PUMP CROSSING	
DRAWING NUMBER: K-00-P-7000-300			DETAIL 14	
DRAWN BY	CHECKED BY	APPROVED BY		
ALS	JTG	RG		
LAST PLOT DATE: Mar. 13 Mar 2008 - 4:07pm				

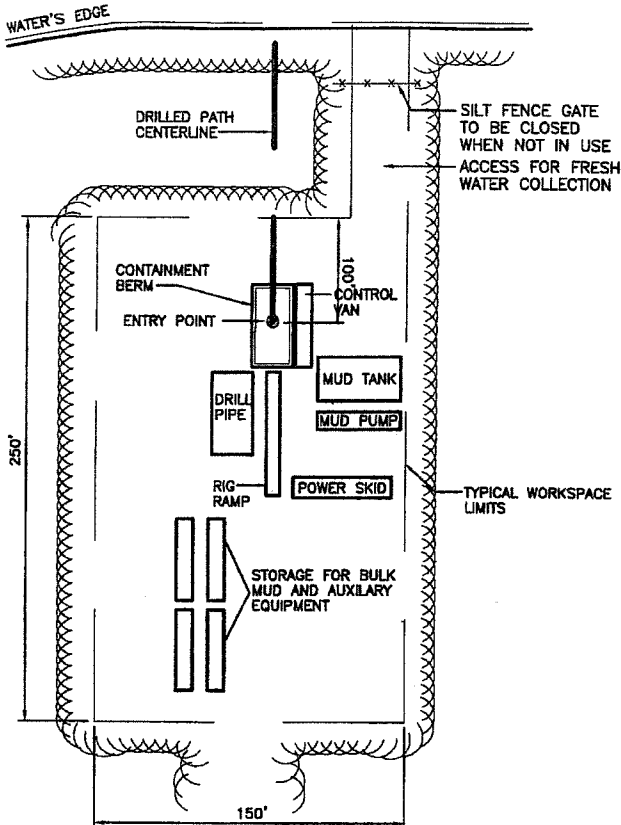
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CONSTRUCTION PROCEDURES:

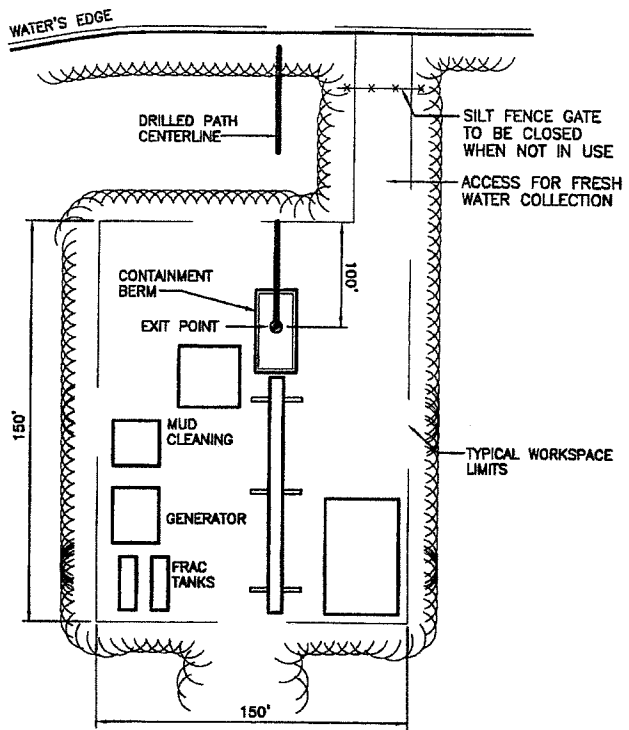
1. WHERE NECESSARY, OBTAIN PRIOR APPROVAL BEFORE USING THE DAM AND PUMP METHOD.
2. IF THERE IS ANY FLOW IN THE WATERCOURSE, INSTALL PUMPS TO MAINTAIN STREAMFLOW AROUND THE BLOCKED OFF SECTIONS OF CHANNEL. THE PUMP IS TO HAVE 1.2 TIMES THE PUMPING CAPACITY OF ANTICIPATED FLOW. A SECOND STANDBY PUMP OF EQUAL CAPACITY IS TO BE READILY AVAILABLE AT ALL TIMES. AN ENERGY DISSIPATOR IS TO BE BUILT TO ACCEPT PUMP DISCHARGE WITHOUT STREAMBED OR STREAMBANK EROSION. IF THE CROSSING IS PROLONGED BEYOND ONE DAY THE OPERATION NEEDS TO BE MONITORED OVERNIGHT.
3. SCHEDULE INSTREAM ACTIVITY FOR LOW FLOW PERIODS IF POSSIBLE
4. MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURES NEEDED TO PROTECT WATER QUALITY. INSTALL PRE-WORK SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE PLAN. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE DAMS AND TO PUMP WATER MUST BE ON SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER CONSTRUCTION. PIPE SHOULD BE STRUNG, WELDED AND COATED AND READY FOR INSTALLATION PRIOR TO WATERCOURSE TRENCHING.
5. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED AND ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS STREAM.
 - a. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY OR INDIRECTLY INTO THE STREAM.
 - b. EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS.
 - c. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION. UTILIZE STRAW BALE BARRIERS ONLY IN LIEU OF A SILT FENCE WHERE FREQUENT ACCESS IS REQUIRED.
 - d. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA, INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
 - e. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED PORTIONS OF THE RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
 - f. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
6. TO THE EXTENT POSSIBLE, MAINTAIN A MINIMUM 10 FEET VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SILT FENCE UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE. THE SILT FENCE SHOULD INCORPORATE REMOVABLE "GATES" AS REQUIRED TO ALLOW ACCESS WHILE MAINTAINING EASE OF REPLACEMENT FOR OVERNIGHT OR DURING PERIODS OF RAINFALL.
7. CONSTRUCT A TEMPORARY SUMP UPSTREAM OF THE DAM AND LINE WITH ROCKFILL IF A NATURAL POOL DOES NOT EXIST. INSTALL THE PUMP OR PUMP INTAKE IN THE POOL OR SUMP. DISCHARGE WATER ONTO AN ENERGY DISSIPATOR DOWNSTREAM OF THE WORK AREA.
8. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 10 FT. OF THE WATERCOURSE. THIS MATERIAL MUST BE CONTAINED WITHIN BERM CONTAINMENT WITH SECONDARY SILT FENCE PROTECTION TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE.
9. CHEMICALS, FUELS, LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT REFUELED WITHIN 100 FT. OF THE WATERBODY. PUMPS ARE TO BE REFUELED AS PER THE SPCC PLANS.
10. STAGING AREAS ARE TO BE LOCATED AT LEAST 50 FT. FROM THE WATER'S EDGE (WHERE TOPOGRAPHIC CONDITIONS PERMIT) AND SHALL BE THE MINIMUM SIZE NEEDED.
11. DAMS ARE TO BE MADE OF STEEL PLATE, INFLATABLE PLASTIC DAM, SAND BAGS, COBBLES, WELL GRADED COARSE GRAVEL FILL, OR ROCK FILL. DAMS MAY NEED KEYING INTO THE BANKS AND STREAMBED. ENSURE THAT THE DAM AND VEHICLE CROSSING ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION. CAP FLUMES USED UNDER VEHICLE CROSSING DURING DRY CROSSING.
12. DEWATER AREA BETWEEN DAMS IF POSSIBLE. DEWATERING SHOULD OCCUR IN A STABLE VEGETATIVE AREA A MINIMUM OF 50 FT. FROM ANY WATERBODY. THE PUMP DISCHARGE SHOULD BE DISCHARGED ONTO A STABLE SPILL PAD CONSTRUCTED OF ROCKFILL SANDBAGS, OR TIMBERS TO PREVENT LOCALIZED EROSION. THE DISCHARGE WATER SHOULD ALSO BE FORCED INTO SHEET FLOW IMMEDIATELY BEYOND THE SPILL PAD BY USING STRAW BALES AND THE NATURAL TOPOGRAPHY DISCHARGED WATER SHALL NOT BE ALLOWED TO FLOW INTO ANY WATERCOURSE OR WETLAND. IF IT IS NOT POSSIBLE TO DEWATER THE EXCAVATION DUE TO SOILS WITH A HIGH HYDRAULIC CONDUCTIVITY, THE EXCAVATION AND PIPE PLACEMENT IS TO BE CARRIED OUT IN THE STANDING WATER. PUMP ANY DISPLACED WATER AS DESCRIBED ABOVE TO PREVENT OVERTOPPING OF DAMS.
13. EXCAVATE TRENCH THROUGH PLUGS AND STREAMBED FROM BOTH SIDES, RE-POSITIONING DISCHARGE HOSE AS NECESSARY. LOWER THE PIPE IN THE TRENCH AND BACKFILL IMMEDIATELY. DURING THIS OPERATION WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE.
14. CONTRACTOR SHALL RESTORE THE STREAM BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, BUT NOT TO EXCEED 2 HORIZONTAL TO 1 VERTICAL.
 - a. CONTRACTOR SHALL INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED ON A SITE SPECIFIC BASIS. IN THE ABSENCE OF SITE SPECIFIC INFORMATION, A FLEXIBLE CHANNEL LINER SUCH AS NAG C125 OR C350 WHICH IS CAPABLE OF WITHSTANDING ANTICIPATED FLOW SHALL BE INSTALLED. ALTERNATIVELY, ROCK RIP-RAP SHALL BE INSTALLED.
 - b. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING.
 - c. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATER COURSE UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.
15. WHEN THE STREAMBED HAS BEEN RESTORED, THE CREEK BANKS ARE TO BE CONTOURED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH FLOW VELOCITY BETWEEN DAMS (E.G., EROSION CONTROL BLANKETS, CRIBBING, ROCK RIP-RAP, ETC.). THE DAMS ARE TO BE REMOVED DOWNSTREAM FIRST. KEEP PUMP RUNNING UNTIL NORMAL FLOW IS RESUMED. COMPLETE BANK TRIMMING AND EROSION PROTECTION. IF SANDBAGS ARE USED FOR THE DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS.

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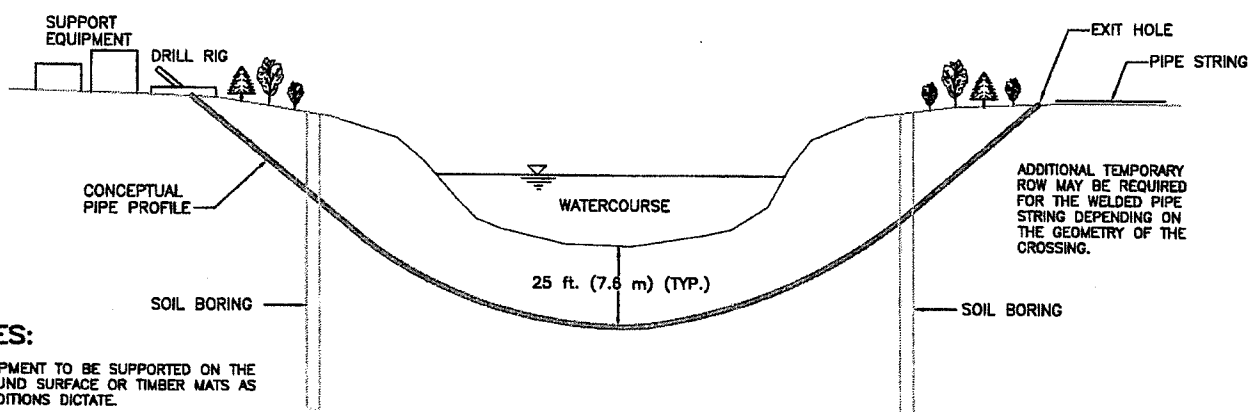
PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-5441 Fax: 1-850-385-6523		 Trow	 TransCanada <i>in business to deliver</i> KEYSTONE PIPELINE PROJECT
NO.	REVISION	DATE	
PROJECT: 50388E			DETAIL 14a
DRAWING NUMBER: K-00-P-7000-300		DRAWN BY: ALS	CHECKED BY: JTG
ISSUED FOR DEPARTMENT OF STATE FILING: MAR 16 2006		APPROVED BY: RG	LAST PLOT DATE: Mar, 13 Mar 2006 -- 4:27pm



**SITE PLAN
ENTER SIDE**



**SITE PLAN
EXIT SIDE**



PROFILE

NOTES:

1. EQUIPMENT TO BE SUPPORTED ON THE GROUND SURFACE OR TIMBER MATS AS CONDITIONS DICTATE.
2. SILT FENCE AND/OR STRAW BALE BARRIER TO BE USES AS REQUIRED.

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			KEYSTONE PIPELINE PROJECT				
			TYPICAL HORIZONTAL DRILL (HDD) SITE PLAN & PROFILE				
NO.		REVISION		DATE		PROJECT:	
						50388E	
ISSUED FOR DEPARTMENT OF STATE FILING			MAR. 10. 2006		DRAWING NUMBER		DETAIL 15
K-00-P-7000-300			APPROVED BY		DRAWN BY		
			JTG		ALS		LAST PLOT DATE: Mar. 10 Mar 2006 - 4:57pm
			RG		JTG		



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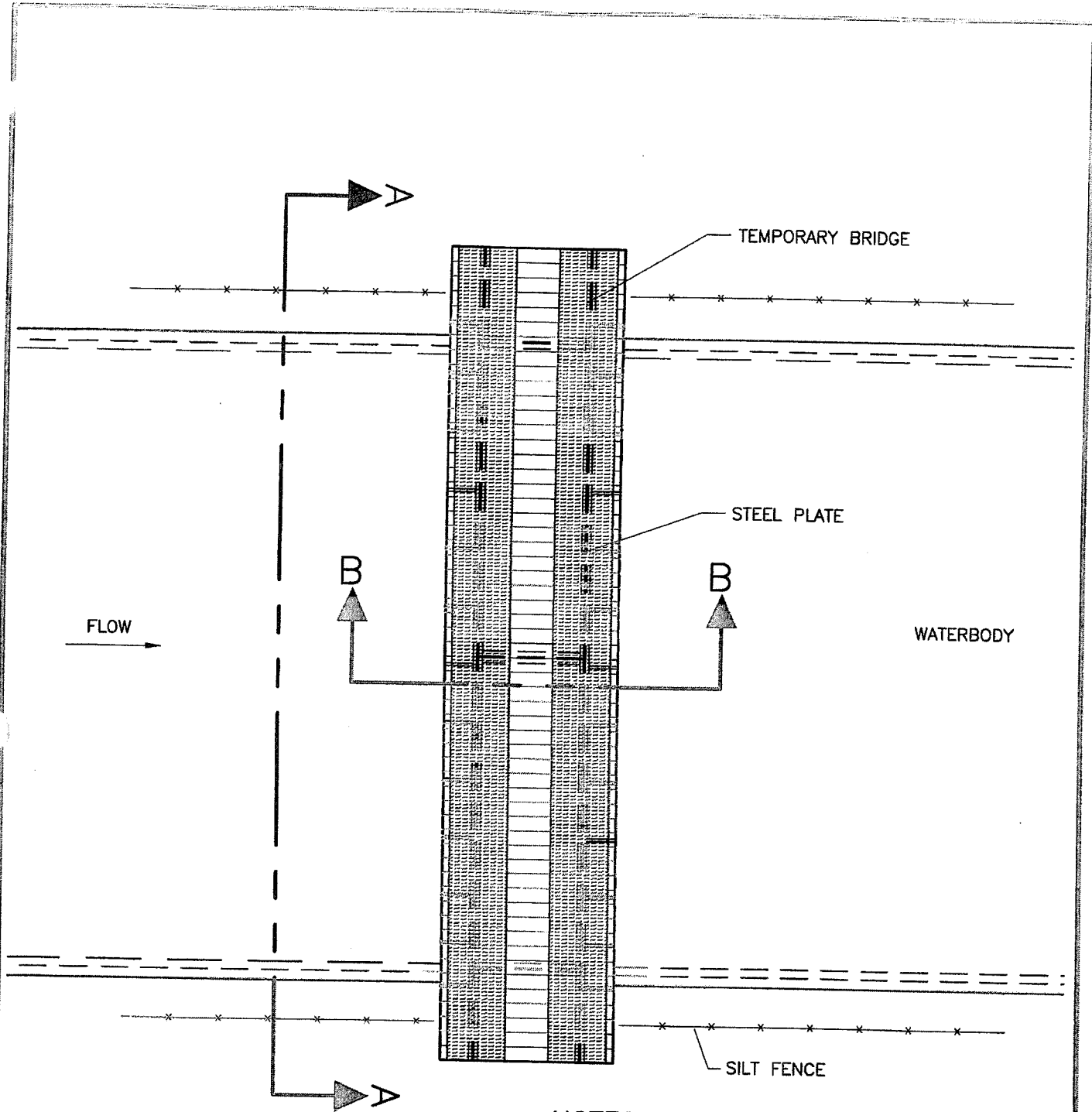
CONSTRUCTION PROCEDURES:

IN GENERAL TERMS, THE FOLLOWING IS A SEQUENCE OF CONSTRUCTION PROCEDURES THAT ARE RECOMMENDED TO BE FOLLOWED FOR TEMPORARY BRIDGE CROSSINGS:

1. A PORTABLE BRIDGE, FLEXI-FLOAT, OR FLUMED VEHICLE CROSSING MAY BE SUBSTITUTED FOR THE TEMPORARY BRIDGE. IT IS IMPORTANT THAT THE SIZE OF THE TOTAL OPENING BE SELECTED SO THE STRUCTURE CAN SAFELY PASS FLOOD FLOWS THAT CAN REASONABLY BE EXPECTED TO OCCUR DURING THE LIFE OF THE CROSSING.
2. DETERMINE BRIDGE LENGTH REQUIRED AND FOLLOW EITHER METHOD A) OR B) FOR DETERMINING THE OPENING SIZE. IF A) IS FOLLOWED, A MINIMUM 6.5 ft. SETBACK FROM TOP OF BANK MUST BE PRESERVED AS A "NO DISTURBANCE AREA." IF ABUTMENTS OR PIERS IN THE STREAMBED ARE REQUIRED, METHOD B) IS TO BE FOLLOWED.
3. INSTALL THE BRIDGE IN A MANNER THAT WILL MINIMIZE SEDIMENT ENTERING THE WATER. STRINGERS MUST BE DESIGNED TO SUPPORT THE LOADS EXPECTED ON THE BRIDGE. CURBS AT LEAST 6 in. HIGH MUST BE INSTALLED ALONG THE EDGE OF THE DECK TO CONTAIN SEDIMENT AND DEBRIS ON THE BRIDGE. FASTENERS CONNECTING COMPONENTS MUST BE STRONG ENOUGH TO HOLD THEM IN POSITION DURING THE LIFE OF THE BRIDGE. CRIBS ARE TO BE FILLED WITH ROCK OR COBBLE. RIP-RAP EROSION PROTECTION IS TO BE PLACED AROUND THE CRIBS AND ON ANY FILL SLOPES PROJECTING INTO THE WATERBODY.
4. ROAD APPROACHES LEADING TO THE BRIDGE MUST BE RAISED AND STABLE SO EQUIPMENT LOADS ARE SUPPORTED A SUFFICIENT DISTANCE BACK FROM THE WATER TO REDUCE SEDIMENT AND DEBRIS ENTERING THE WATERBODY FROM EQUIPMENT TRACKS. THIS MAY REQUIRE USING MATERIALS SUCH AS GRAVEL, ROCK OR CORDUROY. DO NOT USE SOIL TO CONSTRUCT OR STABILIZE EQUIPMENT BRIDGES. IF CUTS ARE NEEDED TO OBTAIN A SATISFACTORY GRADE, THEY ARE TO BE DUG WITH SIDE DITCHES AND STABLE SLOPES. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO KEEP SEDIMENT ON LAND (E.G., SILT FENCING, FILTER CLOTH, RIP-RAP, SEED AND MULCH, ETC.)
5. MAINTAIN A SILT FENCE ON EACH SIDE OF THE WATERBODY EXTENDING A MINIMUM OF 10 ft. BEYOND THE WIDTH OF DISTURBANCE UNTIL VEGETATION HAS BEEN ESTABLISHED IN UPSLOPE AREAS.
6. PERIODICALLY CHECK BRIDGE INSTALLATION AND REMOVE ANY BUILD-UP OF SEDIMENT OR DEBRIS ON THE BRIDGE. DISPOSE OF THIS MATERIAL IN A LOW LYING AREA AT LEAST 100 ft. FROM THE WATERBODY.
7. REMOVE TEMPORARY CROSSINGS AS SOON AS POSSIBLE AFTER FINAL CLEAN-UP. MATERIALS PLACED ALONG THE WATERBODY SHOULD BE COMPLETELY REMOVED DURING FINAL CLEAN-UP. REMOVAL SHOULD NOT OCCUR OUTSIDE THE CONSTRUCTION WINDOWS.
 SURPLUS GRAVEL IS TO BE SPREAD ON THE RIGHT-OF WAY AS GRAVEL SHEETING, IF GRADATION IS SUITABLE, OR MOVED AT LEAST 100 ft. FROM TOP OF BANK FOR DISPOSAL. BRIDGE MATERIALS ARE TO BE REMOVED FROM THE CROSSING AREA. THE WATERBODY BED AND BANKS ARE TO BE RESTORED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH THE EXPECTED FLOW CONDITIONS.



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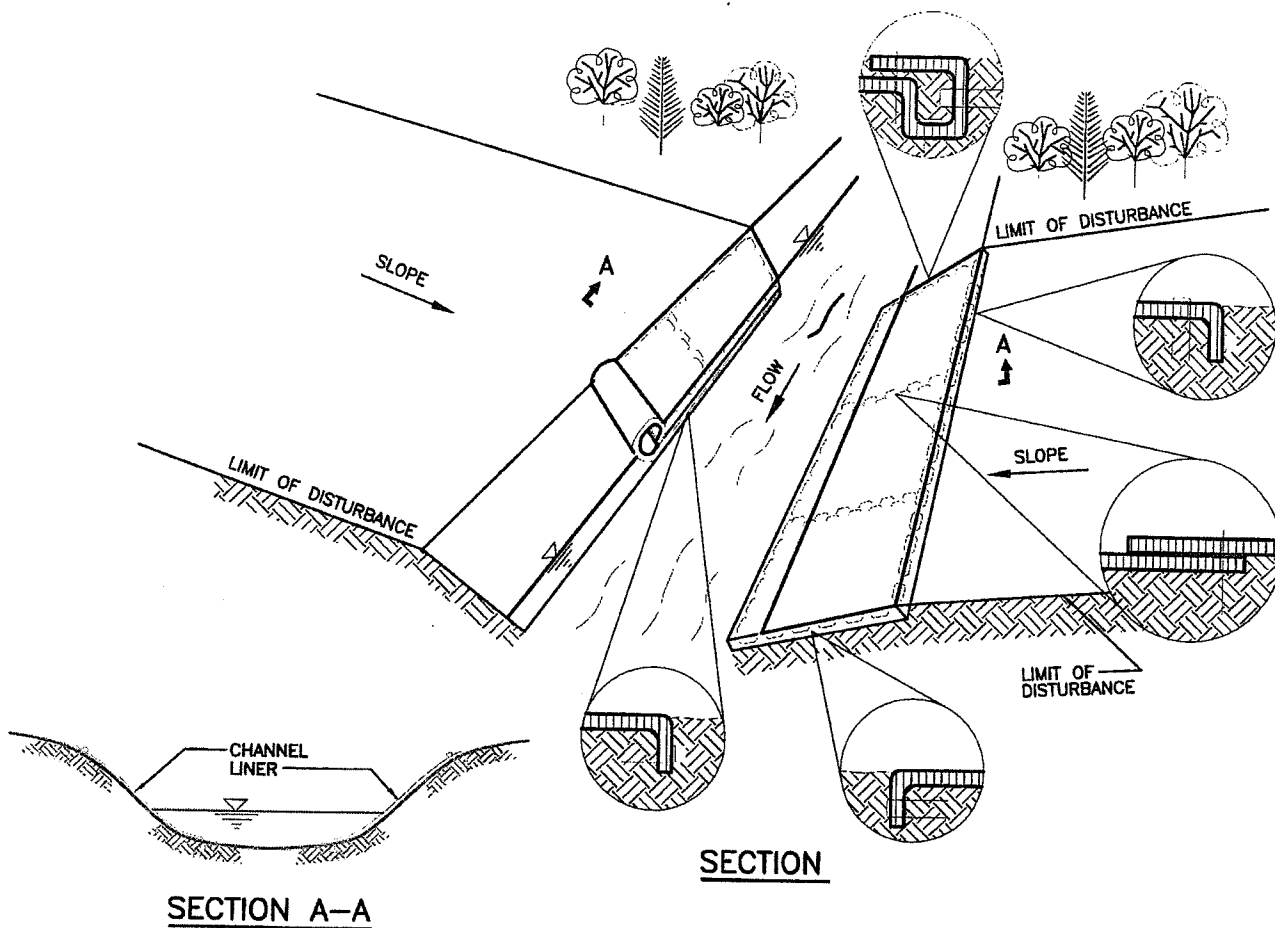
PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1300 Metropolitan Boulevard, Suite 200 Tallahassee, Florida 32308 Phone: 1-850-385-6441 Fax: 1-850-385-5223		 Trow	 TransCanada <i>in business to deliver</i>																		
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PROJECT:		TYPICAL TEMPORARY BRIDGE CROSSING																			
0 ISSUED FOR DEPARTMENT OF STATE FILING		MAR. 18, 2005	50388E																		
DRAWING NUMBER K-00-P-7000-300	DRAWN BY ALS	CHECKED BY JTG	APPROVED BY RG																		
DETAIL 16a			LAST PLOT DATE: Mar. 13 10:30:06 - 4/27pm																		



NOTES:
 1. SEE DETAIL 18a FOR CONSTRUCTION PROCEDURES

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			KEYSTONE PIPELINE PROJECT	
			TYPICAL RAILCAR BRIDGE CROSSING	
			PROJECT: 50308E	DETAIL 18
ISSUED FOR DEPARTMENT OF STATE FILING MAR. 10, 2008				
DRAWING NUMBER K-00-P-7000-300	DRAWN BY ALS	CHECKED BY JTG	APPROVED BY RG	
			LAST PLOT DATE: Mar, 18 Mar 2008 - 4:37pm	

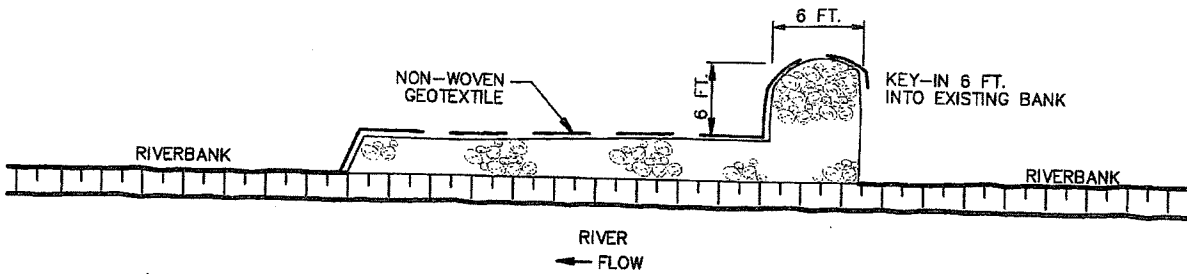


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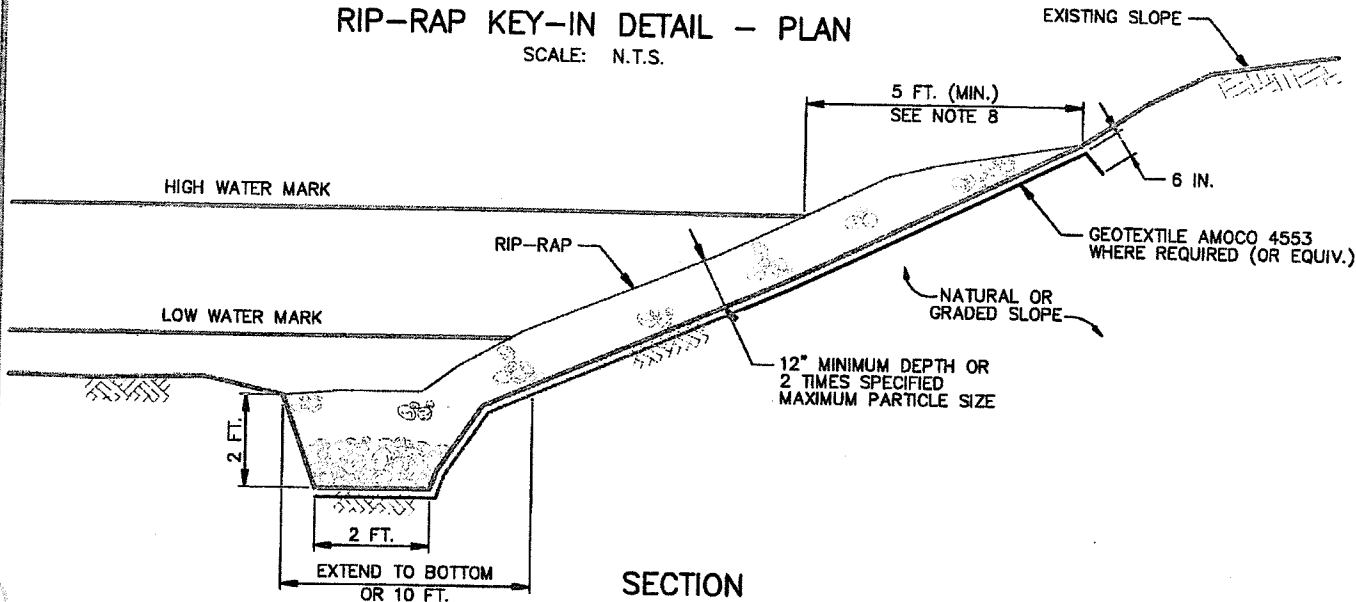
1. INSTALL AND ANCHOR LINERS FOLLOWING MANUFACTURER'S INSTRUCTIONS.
2. PREPARE SOIL BEFORE INSTALLING CHANNEL LINER, INCLUDING THE APPLICATION OF FERTILIZER AND SEED. CHANNEL LINERS SHOULD EXTEND COMPLETELY ACROSS DISTURBED BANK AREAS TO PROTECT ERODIBLE SURFACES.
3. BEGIN AT THE END OF THE CHANNEL BY ANCHORING THE LINER IN A 6 in. x 6 in. (150 mm x 150 mm) TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
4. ROLL LINER IN DIRECTION OF WATER FLOW.
5. INSTALL LINERS END-OVER-END (SHINGLE STYLE) WITH A 6 in. (150 mm) OVERLAP USE A DOUBLE ROW OF STAGGERED STAPLES 4 in. (100 mm) APART TO SECURE LINER.
6. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 ft. (9 TO 12 m) INTERVALS. USE A ROW OF STAPLES 4 in. (100 mm) BELOW THE FIRST ROW IN A STAGGERED PATTERN.
7. INSTALL CHANNEL LINER TO THE TOP OF THE DEFINED CHANNEL SECTION. TWO OR MORE ROWS OF BLANKETS MAY BE NECESSARY, THESE LINERS MUST BE OVERLAPPED 4 in. (100 mm) AND STAPLED.
8. THE CHANNEL LINER SHOULD EXTEND TO THE BASE OF THE CHANNEL AND STAPLED. FOR CHANNELS WITH VERY LITTLE OR NO FLOW. EXTEND A MIN. OF 1 ft. (300 mm) BELOW THE LOW WATER LEVEL AND STAPLE IN PLACE.

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			KEYSTONE PIPELINE PROJECT	
			FLEXIBLE CHANNEL LINER INSTALLATION	
			PROJECT:	50388E
			DETAIL 19	
ISSUED FOR DEPARTMENT OF STATE FILING			MAR. 10 2006	
DRAWING NUMBER	DRAWN BY	CHECKED BY	APPROVED BY	
K-00-P-7000-300	ALS	JTG	RG	
				LAST PLOT DATE: 02/13/2006 - 4:37pm



RIP-RAP KEY-IN DETAIL - PLAN
SCALE: N.T.S.



SECTION
SCALE: N.T.S.

NOTES:

1. REMOVE ALL STUMPS, ORGANIC MATERIAL, AND PREPARE BANKS TO A STABLE CONFIGURATION TO A MAXIMUM SLOPE OF 2 HORIZONTAL TO 1 VERTICAL.
2. CONSTRUCT TOE TRENCH TO KEY IN BOTTOM OF RIP-RAP PROTECTION.
3. INSTALL FILTER CLOTH (GEOTEXTILE), SUCH AS AMOCO 4553 OR EQUIVALENT, UNDER ROCK WHERE SPECIFIED OR AS DIRECTED BY THE COMPANY. ADJOINING EDGES OF CLOTH SHALL OVERLAP A MINIMUM OF 12"
4. ROCK UTILIZED FOR RIP-RAP SHALL CONSIST OF SOUND, DURABLE ROCK, AND RESISTANT TO WEATHERING. INDIVIDUAL PIECES SHOULD BE ANGULAR, BLOCK SHAPED, AND HAVE A MINIMUM SPECIFIC GRAVITY OF 2.2.
5. INSTALL RIP-RAP TO A THICKNESS OF APPROXIMATELY 2 TIMES THE MAXIMUM EQUIVALENT DIAMETER OF THE RIP-RAP. EACH LOAD SHOULD BE WELL GRADED. A WELL GRADED MIXTURE IS COMPOSED 60% (MINIMUM) OF LARGER SIZES WITH 40% OF SMALLER SIZES TO FILL THE VOIDS.
6. SIZE OF RIP-RAP IS DEPENDENT UPON THE PREDICTED FLOW CONDITIONS.
7. KEY IN THE EDGES OF THE RIP-RAP AND FILTER CLOTH TO NATURAL GROUND CONTOURS SO THAT UNDERMINING DOES NOT OCCUR.
8. RIP-RAP IS TO BE INSTALLED TO 2 FT. ABOVE THE NORMAL HIGH WATER MARK OR 5 FT. ALONG THE SLOPE, WHICHEVER IS LESS.

PREPARED BY: TROW ENGINEERING CONSULTANTS, INC. 1399 Metropolitan Boulevard, Suite 299 Tallahassee, Florida 32308 Phone: 1-850-385-5441 Fax: 1-850-485-5523			 Trow	 TransCanada <i>In business to deliver</i> KEYSTONE PIPELINE PROJECT														
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LAST PLOT DATE: Mar. 13 Mar 2008 - 4:07pm																		

30 Drawings/05/05/08 TEMPLATES/04/08 SHI BORDER AND-A 11.5x17.dwg 12/13/2005 12:00:14 PM EST

Caddis, Karen

From: Caddis, Karen
Sent: Friday, March 24, 2006 12:08 PM
To: Wheeler, Cody S NWK
Cc: Ellis, Scott
Subject: Proposed wetland survey protocols for the Keystone Pipeline Project
Attachments: WETLANDFORM2.doc; STREAMFORM.doc; Figure2-1-1_Project_Overview030506.pdf; Wetland Protocol Kansas City 3-23-06.doc

Hello Cody,

Attached for your review is ENSR's proposed wetland survey protocol for the Keystone Pipeline Project and copies of our proposed data sheets and a general project map. We look forward to discussing the protocol with you during our meeting on Monday, March 27, at 2:30 pm at your office in Kansas City. Thank you for your participation in this project and please contact me if you have any questions (970-493-8878).

Karen Caddis

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**ROUTINE WETLAND DETERMINATION FORM (1987
USACE METHOD)**

Site ID No.:

GPS File:

Milepost:

Date:
Staff/Team I.D.:

WETLAND COORDINATES:

Client/Project Name:

Logbook Page No's:

Block/Lot/Tract No.:

Nearest Waterway:

Watershed:

Photo LOCATIONS:

Loop/Facility:

State/County/Municipality:

Drainage Basin:

DOMINANT PLANT SPECIES	Stratum	Indicator	NON-DOMINANT PLANT SPECIES	Stratum	Indicator
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		

Per Cent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-):

REMARKS:

HYDROLOGY

Recorded Data? Describe:

Depth of Surface Water: _____ (in. or cm)

Depth to Free Water in Pit: _____ (in. or cm)

Depth to Saturated Soil: _____ (in. or cm)

Primary Wetland Indicators:

- Inundated
- Saturated in Upper 12 Inches (30 cm)
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands

Secondary Wetland Indicators (2 or more required):

- Oxidized Root Channels in Upper 12 Inches (30 cm)
- Water-Stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other (Explain in Remarks)

REMARKS:

SOILS

Soil Survey Map Unit (Series and Phase):

Taxonomy (to Subgroup):

Drainage Class:

Field Observations Confirm Mapped Type?

Profile Description:

USDA Land Resource Region:

Depth Range (Inches or cm)	Horizon Desig.	Matrix Color (Munsell Moist)	Mottles (Abundance/Contrast/Color)	Texture, Concretions, Structure, Redox Concen., etc.

- Histosol
- Histic Epipedon
- Sulfidic Odor
- Aquic Moisture Regime
- Gleyed or Low-Chroma Colors
- Concretions or Redox Concentrations
- High Organic Content
- Organic Streaking in Sandy Soils
- Listed on Local Hydric Soils List
- Other USDA Hydric Soil Indicator (Explain in Remarks)

REMARKS (INCLUDE SOIL PIT COORDINATES):

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No

Is This Sampling Point Within a Wetland? YES NO

REMARKS:

Special Circumstances?

Significantly Disturbed (Atypical):

Potential Problem Area?

COMPLETE SKETCH OF WETLAND ON BACK OF THIS SHEET: INCLUDE SOIL PIT AND PHOTO LOCATIONS, NORTH ARROW, AND CROSS-SECTION.

ENSR/AECOM

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STREAM DATA -

Date:	Stream Name/Feature I.D. Number	GPS File/Coordinates:	MILEPOST:
Survey Staff/Team Code:	Client/Project Name:	Topo Name:	
Logbook page No's.:	State/County/Municipality:	LOOP/FACILITY NAME:	
Block/ Lot/Tract No.:		Photo No(s).:	Upstr Dnstr

Stream Sketch Plan (include surrounding area, cardinal direction arrow, flow direction arrow, cross-section of crossing with bank heights) – not required if entered on other sheet; use back if additional space required.

Stream Flow	Perceptible Flow? Y or N	Fast Perennial	Moderate Intermittent	Slow Ephemeral	Pooled	None			
Direction: _____									
Avg. Flow Depth (in.)	0 ___	0-3 ___	3-6 ___	6-12 ___	12-24 ___	24-36 ___	36-48 ___	48-60 ___	60+ ___
Stream Width at Crossing (ft.)	Top of Banks:			Channel OHWM:		Water Surface:			
Stream Substrate %	Bedrock %	Gravel %	Sand %	Water Surface:					
Bank Height (ft.) (looking downstream)	Left	0-2	2-4	4-6	6-8	8+			
	Right	0-2	2-4	4-6	6-8	8+			
Bank Slope (%) (looking downstream)	Left	0-20	20-40	40-60	60-80	80+			
	Right	0-20	20-40	40-60	60-80	80+			
Water Clarity	Clear		Slightly Turbid	Turbid	Very Turbid	Color: _____			
Aquatic Habitat	Sand Bar	Gravel Bar	Mud Bar	Gravel Riffles	Deep Pools				
Undercut Banks/Evidence of Erosion?	Overhanging trees/shrubs	In-stream emergent plants	In-stream submerged plants	Bank root systems	Fringing Wetlands				
Aquatic Organisms Observed	Waterfowl	Fish (adult)	Fish (juvenile)	Frogs	Turtles				
	Snakes	Invertebrates	Other:						

T/E SPECIES / SUITABLE HABITAT

RIPARIAN VEGETATION DESCRIPTION

Comments (e.g. pipeline crossing angle, construction constraints, erosion potential, existing disturbances, meanders or width variations)

STREAM QUALITY (indicate)

1	2	3
---	---	---

High Quality – no indication of stress or disturbance in stream or adjacent area – diverse and mature fringing shrub-dominated cover - diverse and stable fish & wildlife habitat – gravel beds, submerged logs, undercut banks, riffles and pools – no channelization –

Medium Quality – mild to moderate disturbances result in minor recognizable alterations – existing pipeline, road, railroad, other ROWs – provides fair fish and wildlife habitat – some erosion potential – some habitat diversity – fine sediment deposition predominate – flow and depth variation restricted – some channelization – trees, grass, or forbs dominate bank vegetation

Low Quality – disturbances cause significant changes affecting plant species – mechanical alteration of plant species and/or soils – intense grazing activities – stream course channelization or ditching – exotic, nuisance, or invasive species – habitat diversity lacking – high erosion potential – flow and depth variation lacking - does not provide suitable wildlife habitat – grass or forbs dominate bank vegetation

**Proposed Protocol for Wetlands and Other Waters of the U.S. Surveys
U.S. Army Corps of Engineers – Kansas City District
Keystone Pipeline Project
March 2006**

Introduction to the Project

Keystone proposes to construct and operate an approximately 1,830-mile-long interstate crude oil transmission system from an oil supply hub near Hardisty, Alberta, Canada to destinations in the Midwestern United States (U.S.). In the U.S., the proposed Project will consist of approximately 1,070 miles of new pipeline constructed from the U.S.-Canada border in Pembina County, North Dakota to terminals and refineries in Salisbury (Chariton County), Missouri, Wood River (Madison County), and Patoka (Marion County), Illinois. Based on interest expressed by crude oil shippers, Keystone is considering the construction of the Cushing Extension, a 295-mile long pipeline segment that would link the Keystone Pipeline at the Nebraska/Kansas border (Jefferson County) with Cushing, Oklahoma. A general map depicting the ROW route in the U.S. is included as an attachment to this protocol document (Attachment A). An additional map package that includes detailed topographic and aerial mapping of the proposed route is also included with this document.

The Project also will require the construction of pump stations, valves, meters, and other ancillary facilities. Electrical powerlines and facility upgrades will be required in some locations to provide power for the new pump stations. Local power providers will be responsible for obtaining the necessary approvals and authorizations for any such construction.

Construction and operation of the proposed project is expected to result in "no net loss" of wetlands since none of the wetlands crossed by the proposed pipeline will be permanently drained or filled, and no aboveground facilities will be placed on wetlands. To minimize potential effects, Keystone will: 1) "neck down" to a construction ROW width of 85 feet at wetland crossings, 2) directionally drill large waterbody crossings (specifically the Missouri River at the Kansas and Missouri stateline, and the Chariton River within the Kansas City District), and 3) reclaim and revegetate wetlands and other Waters of the U.S. (WUS) disturbed during construction as specified in the project's Wetland and Waterbody Crossing Procedures. Because of Keystone's proposed construction methods, it is anticipated that the Keystone Pipeline Project will meet the general conditions identified in Nationwide Permits 12, 14, and 33 and applicable regional conditions for the Kansas City District as specified under this protocol document's methodology section.

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The following sections outline the protocol that Keystone proposes to implement as part of wetland surveys in the Kansas City District that may be required as part of NEPA and the Section 404 notification and application process. Similar protocols are being developed for presentation to other COE districts that will be crossed by the proposed pipeline. These include four districts; Omaha (North Dakota, South Dakota, Nebraska), Kansas City (Kansas and Missouri), St. Louis (Missouri and Illinois), and Tulsa (Kansas and Oklahoma). Initial contacts have been made with COE representatives of each of these districts.

Schedule

Keystone proposes to begin construction of the new pipeline in the spring of 2008, with the system in-service by the end of 2009.

Wetland and other waters of the U.S. (WUS) survey and delineation work is proposed to begin in April or May 2006. Weather, road conditions, and site-specific access concerns will determine the actual timing of the fieldwork. Aerial reconnaissance evaluations may precede the ground surveys for the ROW, all or in part.

Field Personnel

Survey personnel will be provided and managed by Keystone's environmental contractor, ENSR. Several wetland delineation ground survey teams will be assigned per state or COE district. Each team will consist of one wetland delineator formally trained, or sufficiently experienced, in COE wetland delineation techniques and one assistant familiar with providing GPS and technical field assistance. Personnel identifying wetland areas from the air, should an aerial reconnaissance be conducted, will be trained in identifying WUS characteristics visible from the air that will indicate if ground surveys will be required.

Karen Caddis, with ENSR, will serve as the primary COE contact for the project. Ms. Caddis may be reached at 970-493-8878 or kcaddis@ensr.aecom.com for questions or direction. If Ms. Caddis is not available, questions may be directed to Scott Ellis or Heidi Tillquist at the same number.

Methodology

Preliminary Analysis

To initiate this project, ENSR completed a review of USGS topographic maps, National Wetland Inventory (NWI) maps, available soil surveys, and aerial photos pertaining to the proposed ROW. The objectives of this data review were to identify wetlands and other WUS intercepted by the proposed pipeline route,

including intermittent and ephemeral streams, and to identify specific wetlands and other WUS that will require field evaluation to confirm their status.

Other Waters of the U.S.

Using USGS GIS watershed drainage databases (USGS surface water drainages and waterbodies, in cooperation with EPA 2004), a draft version of a table that identifies WUS crossed by the proposed ROW centerline in the Kansas City District was prepared (This table was included in the map package sent to the Kansas City District representative on March 21, 2006). USGS 1:24,000 topographic maps and high resolution aerial photographs of the proposed route were also evaluated to identify areas where the ROW appears to lie within 50 feet of a water feature or run within the high water mark of a drainage for more than 100 feet. These areas and other potential locations of concern associated with drainages and other waterbodies were highlighted on route maps. A copy of these maps was provided to the applicable Kansas City District representative on March 22, 2006.

Wetlands

Maps of the proposed route, including USGS topographic maps and high resolution aerial photography over which NWI wetland polygons were placed, were evaluated for wetland crossings. Areas identified for field checking included: 1) NWI-mapped wetlands intercepted by the pipeline route that are not farmed; 2) areas that appear to meet the wetlands three-parameter criteria, but are not mapped on the NWI; and 3) forested areas where wetland boundaries could not be estimated from aerial photos. Additional areas to be field checked will be included if recommended by the various COE districts. Areas identified on the NWI maps as farmed wetlands or agricultural or roadway drainage ditches were not considered for field delineations. Potential survey areas were highlighted on maps of the proposed route that were provided to the Kansas City District on March 22, 2006.

Site-specific Field Delineation of Potential Wetlands and Other Waters of the U.S.

ENSR will coordinate with the Kansas City District representative regarding features that will be field-checked and delineated. Preliminary areas to be surveyed are identified on maps of the proposed ROW previously provided to the Kansas City District office. For each site surveyed a decision will be made by the field team regarding the presence of wetlands and/or other waters of the United States (WUS). For drainages with no wetland (e.g. unvegetated channel, defined bed and bank, etc.) characteristics, a Stream Data field form developed by ENSR (Attachment B) will be completed to evaluate stream crossing characteristics. This data sheet applies to stream crossings that support, or do not support, adjunct wetland plant communities. If both wetlands and other WUS are present, a Stream Data form and a Routine Wetland Determination Form (Attachment B) will need to be completed for the survey site.

The methods and techniques used to evaluate and delineate wetlands and other WUS on the maps of the proposed route will correspond to those specified for "routine on-site delineations" in the publication

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Corps of Engineers Wetlands Delineation Manual (COE 1987). As identified in the Manual, a "three-parameter" approach will be used for defining wetlands. The COE (1987) requires that, under normal circumstances, all three of the conditions listed below must be met for an area to be defined and delineated as wetland.

1. The prevalent vegetation consists of hydrophytic plants that have the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels.
2. Soils are present and are classified as hydric or possessing characteristics that are associated with reducing soil conditions. Hydric soils are poorly drained and have a seasonal high water table within 6 inches of the surface.
3. The area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (usually 12.5 percent of the growing season) (COE 1987, WTI 1995).

Formal sample point locations will be identified at each potential wetland site visited to adequately characterize the wetland and uplands present and to justify wetland/upland boundaries. Sample points will be paired, where appropriate, to depict wetland and upland community characteristics. Each sample point will be given a unique identification code number and its location will be recorded with a hand-held GPS unit. Sample pits will be dug to a depth of approximately 12 to 16 inches. Vegetation, soil, and hydrology data collected at each sample point will be entered onto a standardized wetland delineation field data sheet (Attachment B). The form will also include a field sketch locating the sample point in relation to the site as a whole. A determination as to whether the sample point qualified as wetland or upland will also be noted on the field data sheet. Wetland/upland boundaries at the sites will be mapped using a GPS system with sub-meter accuracy (Trimble Pro-XRS or equivalent). Photographs showing a representative view of each wetland visited will also be taken. A photo board with the appropriate wetland identification code number will be included in each photograph.

At each sample point, percent total cover of dominant plant species will be visually estimated. Dominant species will be defined as those species in each stratum that, when ranked in decreasing order of abundance and cumulatively totaled, exceed 50 percent of the total dominance measure for that stratum, plus any additional plant species comprising 20 percent or more of the total dominance measure for the stratum. Data form completion will include recording the dominant plant species' wetland indicator status as defined in the U.S. Fish and Wildlife Service's *Revision of the National List of Plant Species That Occur in Wetlands, February 1997* (Reed 1997). Recorded data also will indicate whether hydrophytic vegetation was present at the observation point as described in Part III, paragraph 35 of the 1987 COE Manual. This will include recording all herbaceous species within a 5- to 15-foot radius of the observation

point and all woody species within a 30-foot radius in approximate order of dominance in the community. Species will then be classed as OBL (obligate wetland species), FACW (facultative wetland species), FAC (facultative species), FACU (facultative upland species) or UPL (upland species).

Soil and hydrologic data will also be collected to determine the presence or absence of wetlands at each sample point. The presence of hydric soils at each sample point will be determined using the definition, criteria, and indicators identified in Section III, Paragraphs 36, 37, 44, and 45, and Appendix D of the 1987 COE Manual (with revisions related to the 1991 and 1992 guidance memorandums from the COE). A Munsell Soil Color Chart will be used to determine soil color and soils will be described using standard USDA nomenclature (Munsell 1979). Soil survey reports for each county will also be reviewed, if available. Wetland soil indicators could potentially include the presence of a histic epipedon, mottling, gleying, an aquic soil moisture regime, and high organic matter content and/or organic matter streaking in the surface layers of sandy soils.

Potential wetland hydrology indicators (Section III, Paragraph 49 of the 1987 COE Manual) will include topographic position, presence of standing water and/or saturated soil profile conditions, drainage patterns, water marks, sediment deposits, and/or oxidized root channels in the upper 12 inches of the soil profile. Adjunct test holes will also be dug, where appropriate, to gain additional vegetation, soil, and hydrologic information used to aid in the characterization of wetlands, uplands, and transition zones.

In addition to collecting sufficient data for "routine on-site delineations" as per the *Corps of Engineers Wetlands Delineation Manual* (COE 1987) and channel characteristics data for drainage crossings, wetland survey teams will be required to collect and provide sufficient data (e.g., defined bed and bank and connectivity to navigable waters) for the COE to make jurisdictional determinations for all wetlands and drainage crossings surveyed in the field. However, field personnel would not track the origin and termination of WUS beyond the 300-foot survey corridor. Evidence of connectivity would be completed as an office mapping task using available USGS topographic maps.

Additional Regional Condition Requirements

In addition to general nationwide permit requirements, the following regional conditions have been identified for the Kansas City District that must be considered during field surveys.

Kansas:

1. Notification Requirements. For discharges of dredged or fill material in waters of the United States for the category of activities listed in items b through d below, the permittee must notify the District Engineer in accordance with "Notification" general condition 13.

b. Fens and Bogs. For any regulated activity that impacts a fen or bog of any size.

c. Playa Wetlands. For discharges of dredged or fill material into jurisdictional playa wetlands of any size.

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d. Forested Wetlands. For discharges of dredged or fill material into forested wetlands in the state of Kansas, which impact greater than 1/10 acre of these wetlands. Note: forested wetlands are characterized by woody vegetation that is 20 feet tall or taller.

Missouri:

1. Notification Requirements for Activities in Fens, Seeps and Bogs (Applicable To All NWP's). The permittee must notify the District Engineer in accordance with "Notification" general condition of the NWP's (general condition 13) when any regulated activity impacts a fen, seep or bog of any size.

To address these regional conditions, ENSR would implement applicable surveys to identify these locations as determined in consultation with the COE's Kansas City District representatives.

Work Products

A wetlands delineation report and a Section 404 application package will be prepared upon completion of the wetland and other WUS field surveys. The wetland delineation report will include methodology used, results, a summary and conclusions, and a table identifying wetlands and other WUS that will be crossed by the ROW or associated access roads. The delineation report also would include copies of delineation sheets for ground-truthed wetland areas, photographs of wetlands and waterbody crossings, agency communications, and location maps (presented in 8.5 x 11 inch format). The wetland delineation report will be submitted to the COE either in conjunction with the Section 404 application or earlier if directed to do so by the COE. It is assumed that the Section 404 application will consist of a cover letter, the appropriate application form and map attachments, and the wetland delineation report along with proposed crossing methodologies and engineering cross-sections prepared to support the permit.

Literature Cited

Munsell. 1979. Munsell Soil Color Charts. Kollmorgen Corporation. Baltimore, Maryland.

Reed, P. 1997. Revision of the National List of Plant Species that Occur in Wetlands. Department of the Interior, U.S. Fish and Wildlife Service, in cooperation with the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and Natural Resources Conservation Service. February 15, 1997.

U.S. Army Corps of Engineers (COE). 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Wetland Training Institute, Inc. (WTI). 1995. Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual. Poolesville, Maryland. WTI 95-3.

**ATTACHMENT A
GENERAL PROJECT LOCATION MAP**

**ATTACHMENT B
DATA FORMS**

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FOR INTERNAL KEYSTONE PROJECT USE ONLY

TransCanada – Keystone Pipeline Contact Summary Form

Location of Meeting ENSR
Date/Time of Meeting August 10, 2006
Keystone Team Member(s) Karen Caddis

Contact Information:

Name	Cody Wheeler
Title	Special Projects Manager
Organization	USACOE – Kansas City District
Address	700 Federal Building, 601 E. 12 th Street Attn: OD-R, Room 706 Kansas City, MO 64106
County	
Phone	816-983-3739
E-mail address	cody.s.wheeler@usace.army.mil

Meeting Information:

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

Issue: Geotechnical Exploration Surveys and Nationwide Permitting

Concern Level: High ___ Moderate X Low ___

Description:

I contacted Cody to discuss whether the geotechnical exploration drilling program could be completed under a Nationwide 6 permit. He believed that it could and asked me to send him a notification letter with maps and coordinates. He also recommended that we contact the technical specialists for the levees and other federal flood control projects in the areas of proposed drilling to see if there would be any additional requirements associated with drilling in the vicinity of a levee. Contacts were Charles Detrick (816-389-3605) or Scott Loehr (816-389-3601). Cody indicated that with the current backlog, that it could take up to 3 months to get written confirmation on our notification. He also suggested contacting Rockies Express to see what drilling data they had for the Missouri River crossing and what, if any, extra work they'd had to do related to the levees.

Caddis, Karen

From: Detrick, Charles W NWK [Charles.W.Detrick@nwk02.usace.army.mil]
Sent: Thursday, August 10, 2006 1:08 PM
To: Caddis, Karen
Subject: KEYSTONE PIPELINE PROJECT
Attachments: WBOREF.800.doc

Karen,

I have attached guidance for work near or within a Federally constructed flood control project (channel improvements, floodwalls, earthen levees, etc). Please review it and if you have questions, don't hesitate to telephone or email.

Also, depending upon your routing, there may be Federal Dams and smaller levees in the non-Federal program adjacent to or crossing your routing.

Once I receive the routing from you, I will distribute and see what response I get.

Mailing Address is:

U.S. Army Corps of Engineers
601 East 12th Street
Kansas City, Missouri 64106

Attn: Mr. Charles Detrick, EC-GD, Room 824

Questions or concerns, let me know.

Thank you,

Charles W. Detrick
CENWK-EC-GD
816-389-3605

8/19/2006

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Reference Information Construction On or Adjacent to Federal Levees 6-March-2006

The following list provides sources for locating guidance information regarding construction activities within the critical zone of a federal levee. Please pass this information on to any individuals you believe would benefit (such as local zoning and permitting agency or AE consultants).

<p>Guidance for Work Proposed Near or Within a Federally Constructed Flood Control Project</p> <p>Provides specific Kansas City District guidance regarding design and construction requirements. Adobe format. Can be viewed on-line or printed.</p>	<p>http://www.nwk.usace.army.mil/local_protection/levees.html</p> <p><i>If Web access is not available, contact Geotechnical Design & Dam Safety Section at 816-389-3603 to obtain paper copy (allow 2 weeks for delivery).</i></p> <p>This document will be periodically updated. Suggest that the document dates on the Web site be checked to verify use of the most recent guidance. We welcome any comments regarding ways to improve the guidance. Please send comments to daniel.l.jones@usace.army.mil or call Dan Jones at 816-389-3603.</p>
<p>US Army Corps of Engineers Literature, Guidance, and Manuals</p> <p>Provides current updates of all Corps of Engineers' documents, manuals, and regulations. Adobe format. Can be viewed on-line or printed.</p>	<p>http://www.hnd.usace.army.mil/techinfo/</p> <p><i>Paper copies of some manuals can be obtained from the Kansas City District storeroom (816-426-3360).</i></p> <p>Generally mailed within 3 working days of request. Quantities and types of documents available are limited. The latest updates may not always be available. <i>The user to verify the most current versions, as dated within the Web site documents, are being referenced in the design, plans, and specifications development.</i></p>
<p>Telephone and E-Mail Assistance</p> <p>The Kansas City District staff are available to provide guidance regarding design and construction issues. <i>Prior to contact for assistance, the Guidance should have been accessed and thoroughly reviewed.</i></p>	<p>1. Contact a Corps of Engineers' engineer for direct assistance. Specific contacts are:</p> <p>Scott Loehr.....816-389-3601....scott.a.loehr@usace.army.mil Charles Detrick...816-389-3605.....charles.w.detrick@usace.army.mil</p> <p>2. Contact levee sponsor for coordination and work approval.</p> <p>3. If the engineer is not known, contact 816-389-3603 for general assistance and referral to assigned engineer and/or levee sponsor.</p>
<p>Review and Approval of Designs, Plans and Specifications-Process</p> <p>The Kansas City District provides support to the local sponsors by providing technical review of proposed work. The intent of the review is to insure that the level of protection established by the flood control project is maintained. <i>The guidance contains a checklist that will aid preparers in developing approvable designs, plans, and specifications.</i></p>	<ol style="list-style-type: none">1. All proposed work within the critical area of the levee must be documented through investigations, designs, plans, and specifications.2. Designs, plans, and specifications must be submitted to the local sponsor (administrating drainage district, levee board, or city).3. The local sponsor transmits the designs, plans, and specifications to the Kansas City District for technical review to ensure the flood control criteria and proper design parameters are being utilized.4. The Kansas City District prepares comments or issues technical acceptance of the submitted investigation, design, plans, and specifications to the local sponsor.5. The local sponsor forwards comments to the proposer, or issues approval of the work, or disapproves the work.6. Upon completion of construction, as-built drawings are to be submitted to the Kansas City District for the record. When appropriate and necessary for the flood control, an operations and maintenance manual is to be submitted to the Kansas City District for the record.
<p>Inspections</p> <p>Annual inspections are performed by representatives from the Operations Division.</p>	<p>Please contact Bob Finneran at 816-389-3636 to discuss inspection schedules, flood fight training for levee district and local interests, or other issues pertaining to operation and maintenance of flood protection projects.</p>

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TransCanada – Keystone Pipeline Contact Summary Form

Location of Meeting ENSR
Date/Time of Meeting August 11, 2006/ 12:30 pm
Keystone Team Member(s) Karen Caddis

Contact Information:

Name	R. J. Harmes
Title	
Organization	Milford Lake Project Office Army Corps of Engineers
Address	4020 West K57 Hwy Junction City, KS 66441
County	Clay?
Phone	785-238-5714
E-mail address	

Meeting Information:

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

Issue: Milford Wildlife Area Crossing along Cushing Extension

Concern Level: High ___ Moderate X Low ___

Description:

I contacted R.J. to provide him with information regarding TransCanada's previous contacts with the USCOE in the Kansas City District and to discuss what would be required for ENSR to obtain information on issues associated with the Milford Wildlife Area. R. J. indicated that a Special Use Permit would eventually be required to construct across the property. Even though the regulatory division has received information regarding the project, the real estate division (which Special Use Permits are processed through) would also need information. ENSR is to provide R.J. with maps and aerial photographs of the proposed crossing, plus an introductory letter briefly describing the project. He will then review these for potential issues, such as cultural sites or wildlife concerns, and provide feedback to us to assist with any potential rerouting. Once the ROW has been finalized, he will then send the information/maps on to the Kansas City District office to the real estate office to complete easement action and issuance of the Special Use Permit. He asked that I include land agent contacts in my cover letter for his real estate department to follow up with since issuance of a Special Use Permit is a realty action.

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Follow-up Required / Requested

will provide copies of 1:100,000 scale maps and aerial photograph (if available) of the proposed route along with a cover letter describing the proposed action to Mr. Harmes. He will review it for potential issues and provide a summary letter back to us. Based on the results of that review, it will be determined if any rerouting may be necessary and what, if any, mitigation requirements may need to be implemented. Mr. Harmes will then forward final routing to the Kansas City District's real estate branch for issuance of a Special Use Permit to cross the Milford Lake WMA.

Additional Comments

Need to communication with Ellis and Associates to see if they are aware of the need for a Special Use Permit for the Milford Wildlife Management Area.

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FOR INTERNAL KEYSTONE PROJECT USE ONLY

TransCanada – Keystone Pipeline Contact Summary Form

Location of Meeting ENSR

Date/Time of Meeting August 11, 2006

Keystone Team Member(s) Karen Caddis

Contact Information:

Name	Charles Detrick
Title	Technical Specialist
Organization	USACOE – Kansas City District
Address	700 Federal Building, 601 E. 12 th Street Attn: OD-R, Room 706 Kansas City, MO 64106
County	
Phone	816-389-3605
E-mail address	charles.detrick@usace.army.mil

Meeting Information:

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

Issue: Geotechnical Exploration Surveys and Nationwide Permitting

Concern Level: High Moderate ___ Low ___

Description:

Charles returned my voice message asking for information on regulatory requirements for drilling in levee areas. He indicated that there are no permitting requirements; however, the COE requires that activities be conducted as outlined on the COE's webpage, which he subsequently e-mailed to me. Any activities that occur within 500 feet landward or 150 feet riverward of a federally regulated dam or levee must follow these requirements. The website he provided included a checklist and construction guidelines. Charles also indicated that Special Use Permits may be required, if the work occurs on COE managed land. He asked that we send him maps showing proposed drill locations so he could determine if there were any federal projects drilling the drilling would occur near. The only one he knows of for sure is at the Missouri River crossing.

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Follow-up Required / Requested

J Charles maps and coordinates of the proposed geotechnical sites.

Additional Comments

Sent website information to Carlos Gonzalez-Mier, project engineer to see if he will provide Charles with information. Carlos forwarded on to Henry Freedenberg at Trow to pursue. Henry contacted me and will work with Charles to see that he gets the information that he needs.

August 23, 2006

Mr. Cody Wheeler
Special Projects Manager
USCOE – Kansas City District
700 Federal Building
601 E. 12th Street
Attn: OD-R, Room 706
Kansas City, MO 64106

Re: Keystone Pipeline Project Update

Dear Cody,

Keystone Pipeline Company, LLC (Keystone) has completed initial surveys of wetlands and other waters of the U.S. (WUS) along portions of the proposed Keystone Pipeline Project right-of-way (ROW) in the US Army Corps of Engineer's (USCOE) Kansas City District. At this time, we would like to update you on the status of issues discussed during the March 27, 2006 survey coordination meeting at your office, provide you with copies of previous communications for your records, summarize future survey plans for the Kansas City District, and confirm our understanding of regulatory requirements in your District. Meeting notes, phone communications, and correspondence between Keystone and the Kansas City District through August 21, 2006 are provided as an attachment to this letter.

Major items of discussion are summarized below:

1. During our March 27 meeting, ENSR mentioned that biological, wetland, and cultural resource surveys are currently being completed along 100 percent of the Rockies Express (REX) Pipeline Project right-of-way (ROW) in Kansas and Missouri. A majority of the proposed line in those two states is co-located within the proposed Keystone Pipeline Project ROW. REX surveys consist of a 200-foot wide corridor that includes Keystone's proposed 110-foot wide construction corridor, plus an addition 50 feet for Keystone work space areas. At the time of our meeting, we indicated that Keystone was hoping to reach an agreement with REX to share wetland, biological, and cultural data collected along the route in Kansas and Missouri. As of August 21, 2006, Keystone has purchased this information from REX and the transfer of information is almost complete. You indicated at our meeting that you would be comfortable with Keystone using REX wetland and waterbody GPS and delineation data to determine wetland and waterbody boundaries within the Keystone ROW in those areas where the two projects overlap. Because of the REX survey overlap, field survey areas for Keystone in the Kansas City District would involve only reroutes that deviate from the REX ROW, pump station sites, and large work spaces that extend beyond the survey corridor evaluated under the REX field program. Keystone is currently identifying these locations and field crews are expected to begin delineating wetlands and other WUS in these areas by mid-September 2006.
2. At the March 27 meeting, you indicated that it is likely that disturbance associated with construction of the ROW through the Kansas City District would be permitted under nationwide permits since disturbance would be temporary, less than 0.5 acre, and no permanent structures would be constructed within wetland boundaries. You also indicated that the USCOE would not be likely to issue a Section 404 permit until the EIS

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Record of Decision had been issued. At this time, the Department of State is interviewing consultants to prepare the EIS. A decision on the contractor is expected to be reached by the end of the summer and preparation of the Draft EIS is anticipated in early 2007.

3. Surveys in the Kansas City District to date have followed the guidance provided during the March 27 meeting as summarized here. The Kansas City District expects surveys to be completed at all wetland and waterbody crossings along the ROW in their district. Minor stream crossings and grassy swales could be identified using ENSR's stream crossing form. Grassy swales should be inspected on a case by case basis and photos taken of crossings in those areas. Forested wetlands need to be called out so that potential mitigation for loss of these areas could be calculated.
4. At the March 27 meeting, the USCOE indicated that it was interested in the location of farmed and prior converted wetlands along the ROW. Since the meeting, the Natural Resources Conservation Service (NRCS) state office and the State of Missouri have been contacted for information on these sites. At this time, both agencies have indicated that this information is not available due to privacy restrictions. ENSR and their subcontractors are currently reviewing other potential data sources, such as National Wetland Inventory (NWI) maps of the route, specifically in farmed bottomlands, and will be attempting to identify if any farmed or prior converted wetlands appear to be located in these areas. If so, field delineations may need to be completed in these locations. The USCOE has indicated that the procedure for identifying farmed and prior converted wetlands should be clearly documented in the wetland delineation report and Section 404 application.
5. As field crews complete delineations along the ROW, initial determinations are being made at the request of the Kansas City District as to whether wetlands crossed by the proposed ROW are isolated or not isolated. The thought process used to make that determination is also being documented.
6. As indicated during the March 27 meeting, drainage ditches crossed by the ROW may be considered jurisdictional if they function as or took the place of a natural drainage. Road side ditches are not being surveyed unless they are associated with streams.
7. Regional conditions that may negate the use of nationwide permits have been reviewed on the USCOE's website to confirm that the proposed project can meet all of the requirements.
8. Once field delineations are completed, ENSR can provide the Kansas City District with a summary table of wetlands and waterbodies crossed by the Keystone Pipeline Project. This table would include: the location of the feature; county and state; type of feature (e.g.; intermittent drainage, palustrine emergent wetland); crossing distance and potential temporary disturbance acreage; if the feature is isolated and the reasoning behind that; if it appears that the feature is jurisdictional or not based upon USGS Statsgo data; and proposed crossing methodology (e.g.; open cut, horizontal directionally drilled).
9. ENSR understands that the basic delineation procedures outlined in our protocol provided to you in March is generally acceptable to the Kansas City District. Surveys using these techniques began in May 2006 along selected portions of the ROW as identified in No. 1, above, and will continue in September 2006.

If any of these points are not correct, please let us know and we will work with you to correct our understanding.

Karen will be out of the office between August 28 and October 16, 2006 and will be checking phone messages and e-mails infrequently during that time. If at any time you have questions or concerns

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regarding the project during her absence, please contact Scott Ellis or Heidi Tillquist at 970-493-8878 or via e-mail (sellis@ensr.aecom.com or htillquist@ensr.aecom.com). We appreciate the input you have provided regarding regulatory requirements for your district. Thank you again for your assistance with our project. We appreciate your help.

Sincerely,



Karen Caddis
Wetlands Survey Field Coordinator



Scott Ellis
Environmental Project Manager

Ref. 10623-004-803
Enclosures

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**KEYSTONE PIPELINE PROJECT
COMMUNICATIONS WITH THE KANSAS CITY DISTRICT AS OF
AUGUST 24, 2004**

List of Enclosures
Attached to **Kansas City District USCOE, Mr. Cody Wheeler**
Dated August 25, 2006 Subject Line: Keystone Pipeline Project Status Summary

- *TransCanada Contact Summary*
Keystone Member: Karen Caddis
Phone Communication with US Army Corp of Engineers, Mr. Cody wheeler
Date: January 18, 2006
- *TransCanada Contact Summary*
Keystone Member: Doree Dufresne
Phone Communication with US Army Corp of Engineers, Mr. Cody wheeler
Date: January 30, 2006
- *Keystone Project Meeting: KS State Agencies, Topeka, KS*
Meeting Minutes
February 6, 2006
- *Letter*
To Cody Wheeler
Subject: Keystone Pipeline Project
Date: March 21, 2006
- *Keystone Mainline Maps*
Kansas 5 maps out of 5 Land Access Areas
Missouri 12 maps out of 12
- *Waterbodies Crossing Table 1, 18 pages*
- *Construction Mitigation Plan Rev. 1*
- *E-mail*
From Karen Caddis
To Cody Wheeler
Subject: Proposed Wetland Survey Protocol
Attachments: WetlandForm2.doc, STREAMFORM.doc, Figure2-1-1_Project_Overview030506.pdf, Wetland Protocol Kansas City 3-23-06.doc
- *TransCanada Contact Summary*
Keystone Member: ~~Doree Dufresne~~ *Karen Caddis*
Phone Communication with US Army Corp of Engineers, Mr. Cody wheeler
Date: August 11, 2006

ENSR

1601 Prospect Parkway, Fort Collins, Colorado 80525
T 970.439.8878 F 970.493.0213 www.ensr.aecom.com

August 25, 2006

Mr. Cody Wheeler
Corps of Engineers – Kansas City District
Federal Building
601 East 12th Street
Kansas City, MO. 64106

Subject: Keystone Pipeline Project Geotechnical Field Studies in Kansas and Missouri

Dear Mr. Wheeler:

The Keystone Pipeline Project is proposing to conduct geotechnical exploration surveys in the late summer and fall of 2006 at several river crossings in the Kansas City District. Information collected during these studies will assist in determining the design of pipeline crossing construction at the identified drainage locations. The purpose of this letter is to notify you of the borehole locations that we believe are located within U.S. Corps of Engineers (USACE) jurisdiction (below the ordinary high water mark of a stream channel or within wetlands).

To facilitate your review, the details of the proposed geotechnical exploration site surveys in the Kansas City District including location, equipment utilized, methods of installation and data collection, and resource evaluations are provided in Attachment A (project description), Attachment B (site location table), Attachment C (representative equipment photos). Maps showing the proposed geotechnical exploration survey locations also are enclosed. Surface disturbance at each drill site would occur within an area of approximately 100 square feet. No access roads or paths would be cleared to the sites and no construction would occur within any active channels. No fill or drilling fluids would be discharged and no drilling fluid collection pits would be constructed. The anticipated acreage of disturbance associated with geotechnical activities would be significantly less than 0.5 acre at each proposed bore site and would fall within conditions as outlined under Nationwide Permit Number 6.

ENSR Corporation (ENSR) conducted archaeological surveys at the Missouri River crossing locations depicted on the attached figure. No archaeological sites were identified within areas proposed for surface disturbance. ENSR also contacted the U.S. Fish and Wildlife Service (John Cochnar, Grand Island Nebraska Field Office), the Missouri Department of Conservation (Doyle Brown), and the Kansas Department of Wildlife and Parks (Nate Davis) to verify that there are no threatened and endangered or sensitive species issues at this location.

One borehole (BH-1.14-743.2-03) is believed to be located on COE property. Keystone is currently examining alternative locations for this borehole. Should Keystone decide to utilize the location illustrated on the attached drawing, the project will contact the COE to discuss the requirements for a special use permit.

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We would appreciate your review of the Keystone Pipeline Project's proposed 2006 geotechnical exploration program in the Kansas City District, and subsequent verification that this activity would comply with terms and conditions as outlined under Nationwide Permit Number 6. Please let me know if you would like any further information or need further clarification concerning the geotechnical exploration activities. You may reach me at ENSR at 970-493-8878. Thank you for your assistance.

Sincerely,



Scott Ellis
Regulatory Program Manager

CC: Mike Koski – Trow Engineering

Ref. 10623-004-803

Attachments

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**ATTACHMENT A
DESCRIPTION OF PROPOSED GEOTECHNICAL EXPLORATION SURVEY ACTIVITIES**

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1.0 Purpose

Prior to construction of the proposed Keystone Pipeline Project, geotechnical soil characterization studies must be initiated at major drainage crossings in order to assess the surface and subsurface engineering characteristics of the native soils so that the optimal alignment, profile, and construction plan can be determined. In addition, the Keystone Pipeline Project is evaluating the use of the Horizontal Directional Drill (HDD) Crossing Method for sensitive and complex crossings on the proposed alignment. To assess the technical feasibility of these methods it will be necessary to obtain site-specific geotechnical information at each location.

The aim of the geotechnical soil investigation will be to identify the various soil groups found at the crossings, determine depth to groundwater, locate geologic hazards, collect soil samples, and describe rock properties.

2.0 Description

Borehole Drilling

Locations of the proposed borehole for which notice is being provided are identified in Attachment B.

Borehole installation would require a small drilling rig (CME-45 or equivalent) and one or two support vehicles (such as passenger trucks or SUVs). All boreholes would be installed with a truck-mounted drill rig. Water for the drilling activities would be supplied using either a water truck or a heavy-duty truck, such as a Ford F-350 pulling a trailer with a water wagon. Water from the water tank would be used to mix cuttings from the drill rig with bentonite clay to create the slurry that serves as the drilling fluid during borehole installation. Steel casing would be installed to prevent sloughing of the borehole walls, if necessary. A photograph of a representative drill rig is provided in Attachment C. Rotary drilling would be used to advance the hole while samples would be collected through the use of a hollow tube at the end of the drill. This tube would be pushed into the ground by repeated blows from a large hammer attached to the drill rig. Where formations are encountered that are too hard to be sampled by soil sampling methods, the Contractor would drill into the hard formation with a rock bit to determine the nature of the rock formation encountered.

All excess drilling mud and fluids or waste generated during the investigation will be collected, removed, and transported offsite to an approved location for storage/disposal in accordance with existing regulations. Drilling activities are expected to take approximately 9 days or less at each drainage crossing.

For crossings where HDDs are proposed, at least two boreholes on each side of the sites or series of obstacles would be required. Alternatively, the borings may be located at the ends and intermediate point along the crossing. Each borehole must be completed to a minimum depth of 100 feet, depending on site conditions. Boreholes would generally be offset 25 feet from the proposed pipeline right-of-way alignment. Whenever possible the offsets will alternate on either side of the proposed alignment.

For geotechnical exploration associated with potential HDD crossings, boreholes would be backfilled with Portland Cement Grout. The grout would be pumped from the bottom until the grout nears an elevation of 2 feet below the existing ground surface. The upper 2 feet would be backfilled with native soil. All other boreholes would be backfilled with cuttings to the surface. Local regulations concerning borehole abandonment would take precedence over these requirements.

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Spills would be minimized via proper re-circulation of the mud and by using the cuttings (which may or may not be mixed with cement to plug the hole) so the need for removal of excess cuttings from the site should be reduced. No material would be disposed of in waterbodies or wetlands.

Only approved access roads may be used to access the drill sites. These roads may not be rutted, widened, graded, filled, or resurfaced.

3.0 Proposed Environmental Protection Measures

The following protection measures will be implemented by Keystone and their contractors during the geotechnical exploration surveys:

- Drilling contractors' equipment will be required to not leak any hydraulic fluids, oil, gasoline, or any other fuels. Equipment which leaks or is subject to leaks must be repaired or removed from the project area.
- Contractor shall have absorbent pads available for all equipment to clean and contain any spills of hydraulic fluids, oil, gasoline, or any other fuels. Contractor shall adhere to United States Coast Guard (USCG) and/or United States Army Corps of Engineers (USACE) guidelines for spill prevention measures when working over or adjacent to waterbodies or wetlands, and make any notifications in the case of an emergency.
- Petroleum products and hazardous materials will not be stored and dispensed within 100 feet of wetlands, surface waters or drainage channels or within 150 feet of any wells. All petroleum products and hazardous materials on site will be kept in secure containers with secondary containment structures. Equipment will not be parked within 100 feet of wetland or waterbody boundaries or 150 feet from wells.
- All contaminated soils, adsorbent materials and other contaminated wastes will be handled, contained, and disposed of by the Contractor in accordance with all applicable state and federal regulations.
- Drill rigs may make one pass through wetlands to access borehole locations.
- If vehicle/drill rig traffic is anticipated to create significant rutting within a wetland, the Company's on-site engineer will instruct the Contractor to use support mats to minimize these impacts.
- Support vehicles will not be allowed to drive into the wetland drilling site(s).
- All project activities and equipment, spoil, and material storage will be limited to the area immediately adjacent to the borehole location.
- Water needed for geotechnical drilling will not be obtained from the stream at the drilling location.
- Water from the core hole and water from coring will be contained within a 35-foot radius of the hole. In no instance will any water from the drilling procedure be allowed to leave the site as defined. Excess drilling fluids will be captured in a portable tank, removed from the site, and disposed in a location approved for this type of waste.
- Forging and bridging of streams will not be allowed. Equipment will use only existing surface roads or approved access roads.
- If it is necessary to leave the drill rig parked overnight in a wetland if the borehole cannot be completed during that workday, plastic sheeting will be placed beneath the rig to catch drips or leaks.

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- No refueling will be allowed within 100 feet of wetlands. Drill rigs will be fully fueled prior to entering wetlands.
- Lubricants or other hazardous materials that need to accompany the drill rig within a wetland will be stored within a secondary container.
- Bentonite or other drill fluid additives may be introduced down hole but will not be discharged onto the surface of the wetland. Any inadvertent surface release of bentonite or other drilling liquids/slurries will be contained and removed from the wetland.
- Spill response materials will be carried on the drill rig in the event of a spill or release of fuels or other hazardous materials. Spills will be contained, cleaned up and reported to the Company immediately.

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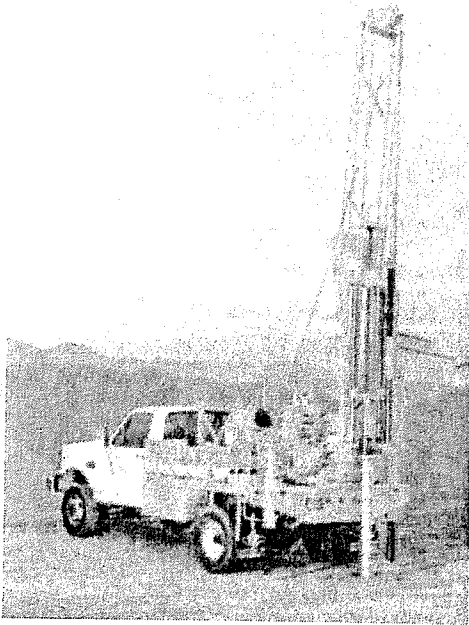
**ATTACHMENT B
PROPOSED GEOTECHNICAL EXPLORATION SURVEY SITE LOCATION TABLE**

Table B-1 Proposed Geotechnical Exploration Survey Sites in the Kansas City USACE District

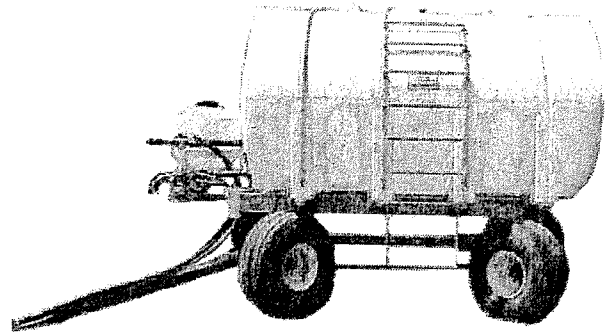
Site Number	Borehole ID	Number of Boreholes	Approximate Milepost (MP)	Feature(s)	State	County	Section-Township-Range	X Coord.	Y Coord.
1.14	BH-1.14-743.2-01	4	743.2	Missouri River	Kansas & Missouri	Doniphan (KS) & Buchanan (MO)	20-4S-22E	330868.24	4395417.89
	BH-1.14-743.2-02							331052.51	4395358.36
	BH-1.14-743.2-03							331291.93	4395259.78
	BH-1.14-743.2-04						21-56N-36W	331607.22	4395113.56

**ATTACHMENT C
REPRESENTATIVE PHOTOS OF PROPOSED GEOTECHNICAL EXPLORATION EQUIPMENT**

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CME 45 DRILL RIG



WATER WAGON



NOTES:
 THE ACCESS TO BOREHOLE SITES WILL NOT INVOLVE THE CLEARING OF TREES OR THE BUILDING OF ROADS. MATS WILL BE USED AS NECESSARY.

Legend

	BH-###	APPROXIMATE BORING LOCATION, IDENTIFICATION NUMBER.
	---	PROPOSED ACCESS TO SITES

2005 AERIALS



NO.	REVISION	DATE	APPR.
1	ADDED PROPOSED ACCESS ROADS (MODIFIED BH-01, BH-02, BH-03, BH-04 LOCATIONS)	08.25.06	RG
0	ISSUED WITH KML 01-00007-01-AA-130-R01 AND KEYSTONE LIMITED DISTRIBUTION	07.31.06	RG

PREPARED BY:
TROW ENGINEERING CONSULTANTS INC.
 1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida, USA 32308
 Phone: 1-850-385-5441
 Fax: 1-850-385-5523

TransCanada
 In business to deliver
KEYSTONE PIPELINE PROJECT
 MISSOURI RIVER CROSSING

SCALE	DATE	DRAWN	CHECKED	APPROVED	PROJECT	DRAWING NUMBER	SHEET	REVISION
1"=200'	05/31/2006	AH	JTG	RG	50388E	K-29-P-6000-Z-1.14A	1.14	1