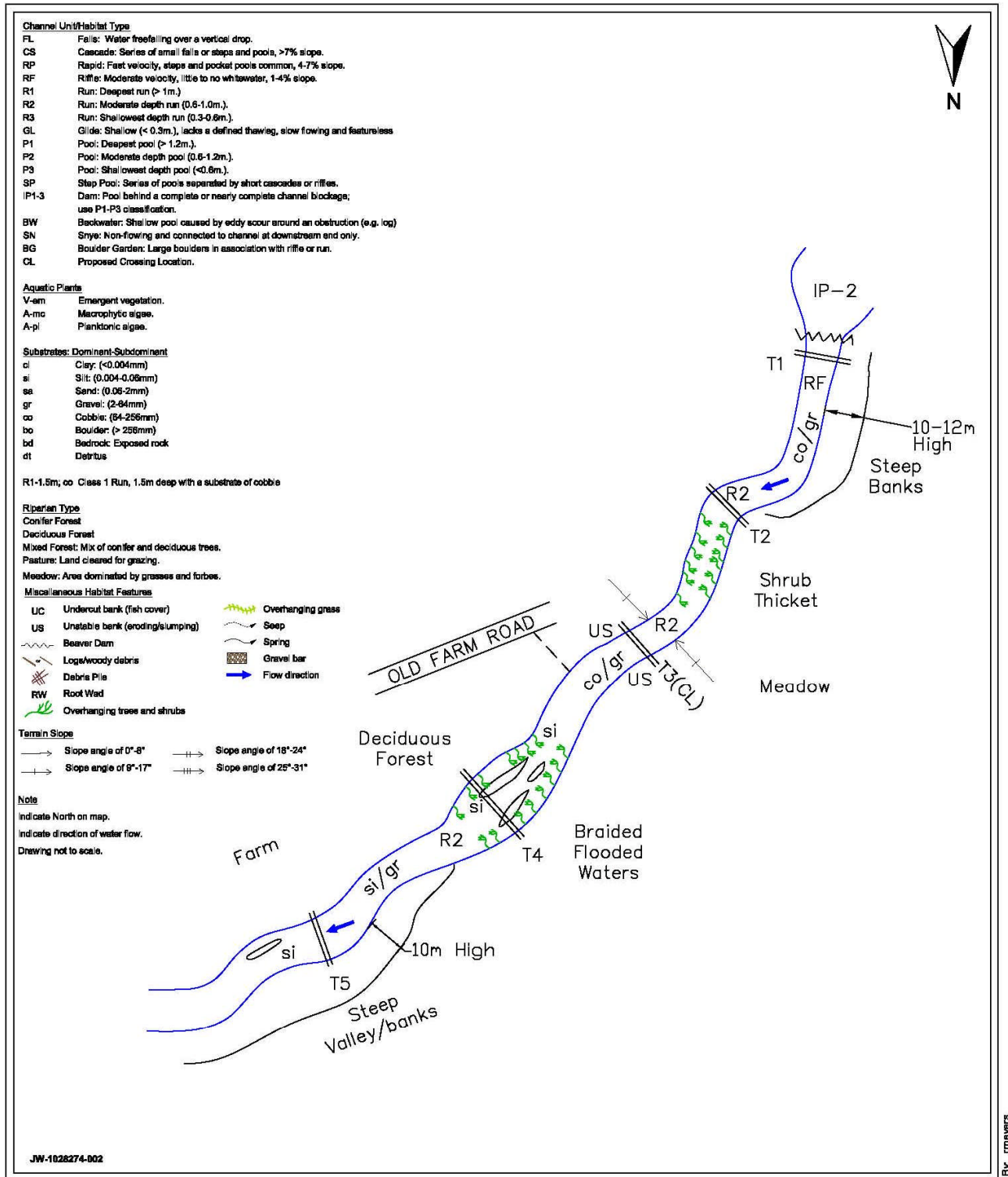


<u>Geographical Data</u>	<u>Physical Channel Data</u>																																																																																																																														
UTM Location: 12U 648639 5532284 Datum: NAD 83 Province: SK Survey Date: June 18, 2008 Crew Initials: RS, LM	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Transect</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td colspan="6">Channel and Flow</td> </tr> <tr> <td>Channel Width (m)</td> <td>2.8</td> <td>4.6</td> <td>4.8</td> <td>4.2</td> <td>4.5</td> </tr> <tr> <td>Wetted Width (m)</td> <td>2.8</td> <td>4.6</td> <td>3.1</td> <td>4.2</td> <td>4.5</td> </tr> <tr> <td>Depth at 25% (m)</td> <td>0.25</td> <td>0.36</td> <td>0.31</td> <td>0.25</td> <td>0.29</td> </tr> <tr> <td>Vel. at 25% (m/s)</td> <td>0.31</td> <td>0.06</td> <td>0.34</td> <td>0.08</td> <td>0.4</td> </tr> <tr> <td>Depth at 50% (m)</td> <td>0.24</td> <td>0.37</td> <td>0.31</td> <td>0.25</td> <td>0.29</td> </tr> <tr> <td>Vel. at 50% (m/s)</td> <td>0.95</td> <td>0.17</td> <td>0.26</td> <td>0.20</td> <td>0.03</td> </tr> <tr> <td>Depth at 75% (m)</td> <td>0.18</td> <td>0.37</td> <td>0.29</td> <td>0.31</td> <td>0.29</td> </tr> <tr> <td>Vel. at 75% (m/s)</td> <td>0.05</td> <td>0.18</td> <td>0.16</td> <td>0.07</td> <td>0.20</td> </tr> <tr> <td colspan="6">Banks</td> </tr> <tr> <td>Left Bank Ht (m)</td> <td>1.50</td> <td>0.45</td> <td>0.30</td> <td>0.30</td> <td>0.15</td> </tr> <tr> <td>Right Bank Ht (m)</td> <td>1.50</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.30</td> </tr> <tr> <td>Bank Stability</td> <td>L/L</td> <td>L/L</td> <td>L/L</td> <td>L/L</td> <td>L/M</td> </tr> <tr> <td colspan="6">Substrate Type and Distribution (%)</td> </tr> <tr> <td>Fines</td> <td>20</td> <td>50</td> <td>20</td> <td>50</td> <td>20</td> </tr> <tr> <td>Gravel</td> <td>30</td> <td>50</td> <td>50</td> <td>30</td> <td>60</td> </tr> <tr> <td>Cobble</td> <td>48</td> <td>-</td> <td>30</td> <td>18</td> <td>15</td> </tr> <tr> <td>Boulder</td> <td>2</td> <td>-</td> <td>-</td> <td>2</td> <td>5</td> </tr> <tr> <td>Instream Cover (%)</td> <td>25</td> <td>45</td> <td>5</td> <td>20</td> <td>15</td> </tr> <tr> <td>Overhead Cover (%)</td> <td>28</td> <td>65</td> <td>5</td> <td>70</td> <td>75</td> </tr> </tbody> </table>	Transect	1	2	3	4	5	Channel and Flow						Channel Width (m)	2.8	4.6	4.8	4.2	4.5	Wetted Width (m)	2.8	4.6	3.1	4.2	4.5	Depth at 25% (m)	0.25	0.36	0.31	0.25	0.29	Vel. at 25% (m/s)	0.31	0.06	0.34	0.08	0.4	Depth at 50% (m)	0.24	0.37	0.31	0.25	0.29	Vel. at 50% (m/s)	0.95	0.17	0.26	0.20	0.03	Depth at 75% (m)	0.18	0.37	0.29	0.31	0.29	Vel. at 75% (m/s)	0.05	0.18	0.16	0.07	0.20	Banks						Left Bank Ht (m)	1.50	0.45	0.30	0.30	0.15	Right Bank Ht (m)	1.50	0.20	0.20	0.20	0.30	Bank Stability	L/L	L/L	L/L	L/L	L/M	Substrate Type and Distribution (%)						Fines	20	50	20	50	20	Gravel	30	50	50	30	60	Cobble	48	-	30	18	15	Boulder	2	-	-	2	5	Instream Cover (%)	25	45	5	20	15	Overhead Cover (%)	28	65	5	70	75
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<p style="text-align: center;"><u>Fish Sampling Data</u></p> Methods: Electrofish, minnow traps Fish species captured: WHSC, BRST Historical Data 1932-minnow and sucker sp.																																																																																																																															
Habitat rating: marginal Level of protection: minimum																																																																																																																															

<u>Habitat Assessment Summary</u>			
	Forage Fish	Coarse Fish	Sport Fish
Rearing Habitat:	good	good	good
Overwintering Habitat:	poor	poor	poor
Spawning Habitat:	moderate	good	good
Migration:	moderate	poor	poor

Comments: Surrounding land use is predominantly agricultural. The adjacent existing crossing RoW is heavily degraded by cattle use. Upstream and downstream of the crossing, the riparian area is covered by thick willow/cottonwood growth. There is slight braiding and overflow downstream of the proposed crossing due to above average flows and cattle degradation of banks. Abundant LWD along reach, except 20m modified area upstream and downstream of existing crossing. Riffle/Pool habitat upstream of proposed crossing location. Road crosses stream 400m downstream of crossing location. Seasonal flow variance, lack of connectivity to a major watershed, and high pH may be prohibitive to most fish species. Instream vegetation, cobble/boulders and woody debris provide good rearing habitat.

<p style="text-align: center;"><u>Water Quality Data</u></p> <table style="width: 100%;"> <tr><td>Date</td><td>18/06/08</td></tr> <tr><td>Time of Day</td><td>08:45</td></tr> <tr><td>Water Temperature (°C)</td><td>14.6</td></tr> <tr><td>pH</td><td>9.1</td></tr> <tr><td>Dissolved Oxygen (mg/L)</td><td>8.70</td></tr> <tr><td>Conductivity (µscm⁻¹)</td><td>532</td></tr> <tr><td>Turbidity (NTU)</td><td>6.3</td></tr> </table>	Date	18/06/08	Time of Day	08:45	Water Temperature (°C)	14.6	pH	9.1	Dissolved Oxygen (mg/L)	8.70	Conductivity (µscm ⁻¹)	532	Turbidity (NTU)	6.3	<p style="text-align: center;"><u>Proposed Crossing Methods</u></p> <p>Pipeline: Isolation method outside of the RAP. Open-cut method allowed when water body is dry or frozen to the bottom.</p> <p>Vehicle Access: Temporary culvert or temporary bridge on RoW</p>	<p style="text-align: center;">Data Summary Sheet</p> <p style="text-align: center;">Site 56: Skull Creek</p> <div style="text-align: center; font-size: 1.2em; font-weight: bold; padding: 10px;"> Keystone XL Pipeline Project </div> <div style="text-align: center; padding-top: 10px;"> </div>
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By: rmayers

TRANSCANADA KEYSTONE PIPELINE GP LTD
HABITAT MAP

Site 56 - Skull Creek

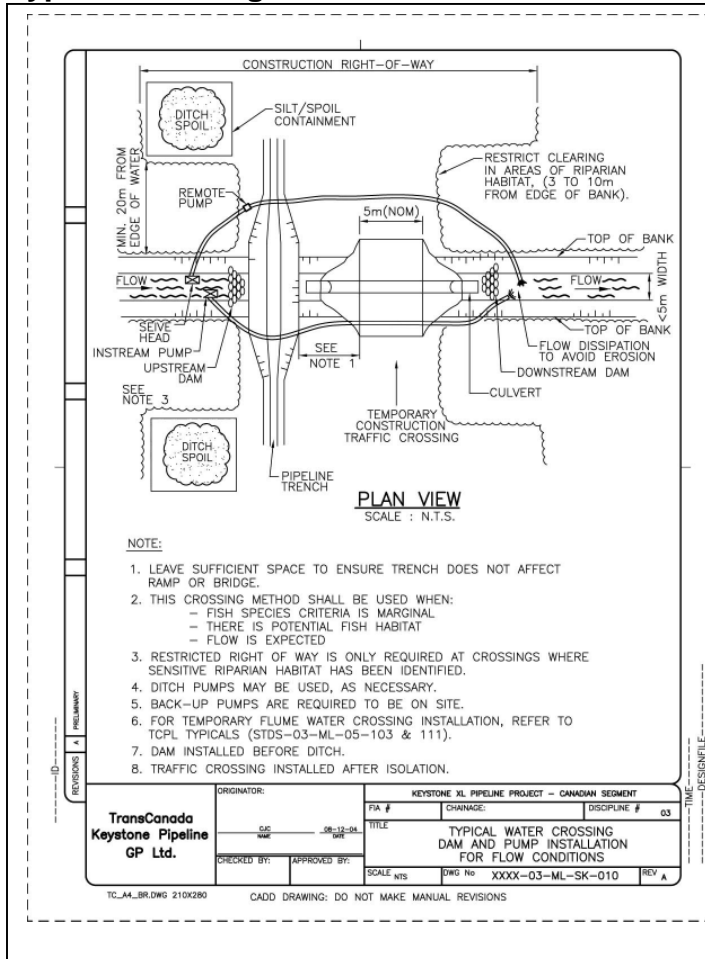
Acknowledgements: Original drawing by Jacques Whitford AXYS Ltd.



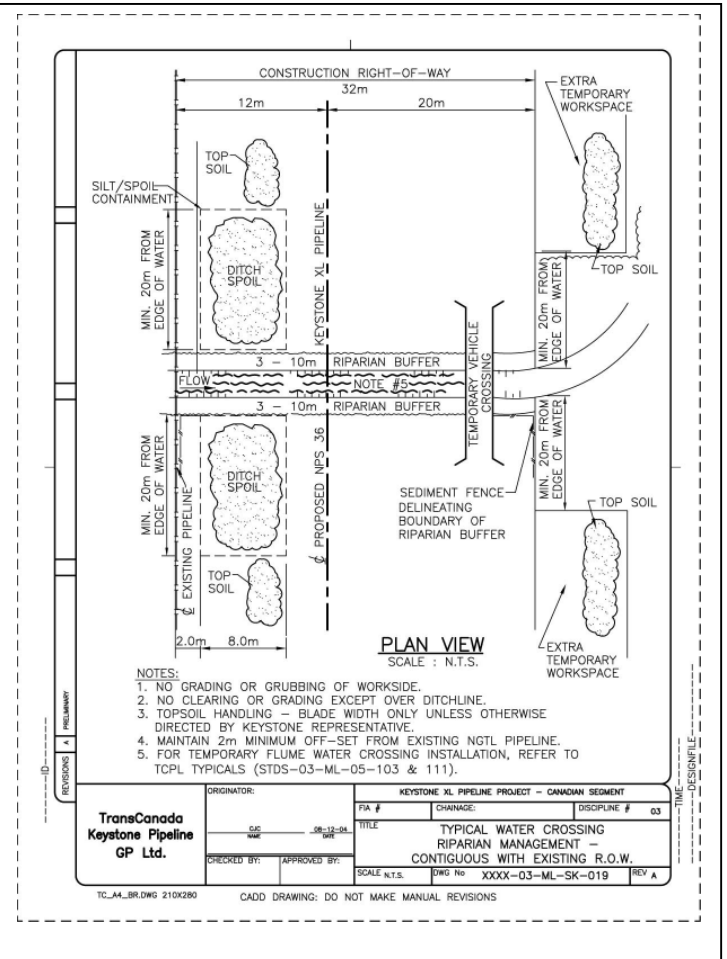
APPROVED BY:
DRAWING NO. **010**

Last Updated: February 17, 2008

Typical Crossing Plan



Site Plan



Construction Mitigation

- Schedule construction during low flows and outside of the restricted activity period (April 1 – May 31).
- Develop site specific Erosion and Sediment Control Plan, as site contains erodible soils.
- Restrict clearing and grubbing of riparian area to the ditchline and vehicle crossing location and position workspace with setback to avoid riparian area.
- Ensure equipment is clean before arriving on-site to minimize risk of introducing and spreading weeds and invasive non-native plant species.
- Salvage fish stranded in the dewatered channel, and release downstream of the lowermost dam.
- Ensure any water pumped from the excavation area is discharged into a sediment trap, filter bag or vegetated area to allow sufficient filtering of suspended solids. The dewatering area should be located well back from the channel.
- Restore channel and banks to pre-construction configuration.
- Mitigate erosion using any necessary measures, which might include silt fencing, bioengineering and/or the use of geotextile. Seed exposed areas with an approved seed mix as soon as practical following construction.

Reclamation Schematic

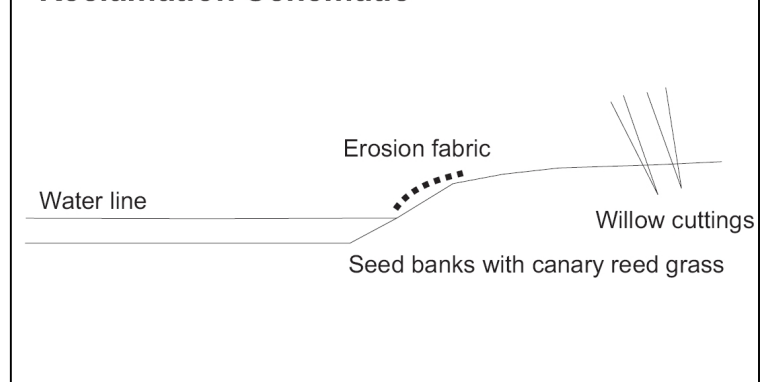




Photo 1 **Site 56 Skull Creek: View Upstream of Proposed Crossing Location. June 18, 2008.**



Photo 2 **Site 56 Skull Creek: View Downstream of Proposed Crossing Location. June 18, 2008.**



Photo 3

Site 56 Skull Creek: View of Left Downstream Bank at Proposed Crossing Location. June 18, 2008.



Photo 4

Site 56 Skull Creek: View of Right Downstream Bank at Proposed Crossing Location. June 18, 2008.