

Site 1 – Lusk Creek

The Lusk Creek crossing on Highway 40 is located approximately 400 m north of the junction between Highway 40 and Highway 68. There is a fill embankment across Lusk Creek with a large diameter culvert carrying the creek flow across the highway right-of-way. The height of the fill embankment is in the order of 10 m and the diameter of the culvert is in the order of 4 to 5 m.

The creek channel upstream of the highway was relatively clear of debris and lined with naturally deposited, rounded, cobble to boulder sized rocks. Published topographic maps of this area show that the gradient of the creek channel for several kilometers upstream of Highway 40 is less than 5°. The creek channel within approximately 1.5 km upstream of the Highway 40 crossing is meandering across a relatively flat valley bottom in the order of 100 m wide. Given the channel gradient in this area, the size of the floodplain around the channel, and the visual appearance of the channel and floodplain upstream of the highway during the site inspection and on the airphotos, it is judged that the hazard of a debris flow along the creek channel affecting the Highway 40 crossing is negligible.

As shown in Photo 1, some erosion of the soil at the toe of the embankment sideslope immediately south of the culvert inlet was noted at the time of the field inspection in October 2005. It is judged that this erosion was caused by peak flows during and after the heavy rainfall in this area during June 2005. The culvert inlet does not appear to have been damaged by the erosion. If the eroded area is left in this condition, the exposed soil will continue to erode in the future and the erosion will likely retrogress slightly further into the toe of the highway embankment.

As shown in Photo 2, a footbridge along a hiking trail that crosses Lusk Creek approximately 50 m downstream of Highway 40 was also damaged during peak creek flows earlier in 2005.

AMEC recommends the following Risk Level factors for this site using the debris flow frequency-severity matrix:

- Probability Factor of 1 based on the lack of visual evidence of current or historical debris flow activity.
- Consequence Factor of 1 given the large culvert in place at this crossing.

Therefore, the recommended Risk Level for this site is 1.

It is recommended that the erosion area on the south side of the culvert inlet be armored with rip-rap in order to prevent future erosion of the exposed soil.



Photo 1 (top) – October 2005 – Culvert inlet at the toe of the east highway embankment sideslope at the Lusk Creek crossing. Peak flows earlier in 2005 have caused soil erosion at the toe of the sideslope immediately south of the culvert inlet (on the left side of this photo).



Photo 2 (bottom) – Footbridge across Lusk Creek, approximately 50 m downstream of the culvert at Highway 40. The south end of this bridge was washed out during peak flows in June 2005.