

LANDSLIDE RISK ASSESSMENT  
SOUTHERN REGION

**SITE S12: SPRAY LAKES ROAD**

LEGAL LOCATION: **LSD 7-29-24-10 W5M**

REFERENCE LOCATION  
ALONG HIGHWAY Located on Spray Lakes Road, Canmore, AB.

UTM COORDINATES: **N 5659500 E 614350** (NAD27)  
NTS Map Sheet 82 O/3 (Canmore)

AI FILE: n/a

AI PLAN & PROFILE: n/a

Date of Initial Observation: late 1980's

Date of Last Inspection: Inspected in July, 2003

Instruments Installed: none

Instruments Operational: n/a

Risk Assessment: PF(7) \* CF(9) = **63**

Last updated by: AMEC, August 2003

Comments: n/a

## **Location**

The site is located on the Spray Lakes Road in Canmore, AB, just northwest of the junction between the Spray Lakes Road and Three Sisters Parkway.

## **General Description of Instability**

This site is underlain by abandoned coal mine workings dating from 1886 to the early 1900's. Ground subsidence features attributed to these mine workings have been noted in the areas to the north and south of the road at this site. Subsidence features have not been noted in the road surface itself, however on two occasions in the 1980's and 1990's small cavities were noted on the south shoulder/in the south ditch of the road.

## **Geologic Setting**

The general area of this site is underlain by bedrock containing steeply dipping coal seams (generally in the order of 55°, but sometimes up to 85°). The surficial soils are very thin to non-existent. There is a rock outcrop/cut slope adjacent to the south ditch of the road.

The December 2002 boreholes that were drilled at this site encountered up to approximately 1 m of "overburden" (no detail given), which was underlain by a sequence of mudstone over voids interspaced with coal deposits/seams. This bedrock sequence extended beyond the depths of completion of the boreholes, which were up to approximately 21 m. The voids were typically in the order of 2 to 5 m in vertical thickness (measured in the boreholes), and were encountered at depths of as little as 2 to 3 m below the existing ground surface.

## **Chronological Background**

Table A1 provides the Chronological Background of the site.

## **Past Investigations**

The Norwest Corporation January 31, 2003 report on this site refers to the following past investigations and mitigative work:

- Subsidence features to the north of the road have been mitigated, as reported in Norwest Corporation "Alberta Environment – Canmore Creek Undermining Report", February 10, 2001.
- Construction of the Rundle Water Main Trunk in the south ditch adjacent to the road in 1993 included a site investigation with drilling, trenching, and ground penetrating radar (GPR) surveys.
- GPR surveys in by Komex International Limited in November 2000. These surveys were performed along four lines on the edges of the pavement and ditches on both sides of the road at this site.

The documentation for the above-noted work (aside from the Norwest January 2003 report) has not been reviewed by AMEC.

The first site inspection by AMEC and AT personnel was performed on July 7, 2003.

**Mitigative Measures Taken**

None, to date, aside from backfilling the “sinkhole” that appeared in the south shoulder of the road in the late 1980’s.

**Monitoring Overview**

No monitoring has been performed to date aside from the previous investigations noted above.

**Table A1 –S12 – Spray Lakes Road - Chronological Background**

<b>YEAR</b>	<b>MONTH</b>	<b>DESCRIPTION</b>
1886 to early 1900's		Canmore Mines Ltd. No. 1 mine worked out four steeply dipping coal seams in the general area below the site.
Late 1980's		"Sinkhole" noted in the south shoulder of the road. It is understood that this sinkhole was backfilled without further investigation.
1993		Rundle Water Main Trunk line constructed in the south ditch of the road. A small cavity was encountered during the trench excavation. This cavity was approximately 1 m in diameter and 1.5 m deep, and was attributed to subsidence over the mined out No. 2 seam.
2000	November	GPR surveys by Komex International Ltd., for Alberta Environment as part of a mine mitigation program on the lands adjacent to the Spray Lakes Road.
2002	December	Borehole drilling along the south shoulder of the road by Norwest Corporation. The borehole locations were selected to target areas where cavities were indicated in the November 2000 GPR surveys. Cavities were encountered in 6 of the 7 boreholes, with the shallowest cavities within 2 to 3 m of the existing ground surface.
2003	January	Downhole video camera inspections of 4 of the December 2002 boreholes. The upper cavities associated with the No. 3 seam were accessible and were found to be continuous between some of the boreholes. The lower, more extensive cavities associated with the No. 2 seam were not accessible due to sloughing of material from the walls of the boreholes.
	July	Site inspection by AMEC and AT personnel.