APPENDIX A

Risk Level (RL) = (Probability Factor, PF) x (Consequence Factor, CF)

Table A – Geohazard Risk Level Factors – Earth slides and debris flow

Probability Factor (ranked on a scale of 1 to 20)	
1	Inactive, very low probability of slide occurrence.
3	Inactive, low probability of remobilization
5	Inactive, moderate probability of remobilization, uncertainty level moderate, or active but very slow rate of movement or indeterminate movement pattern.
7	Inactive, high probability of remobilization or additional hazards, uncertainty level high, or active with perceptible movement rate and defined zone(s) of movement.
9	Active with moderate steady, or decreasing, rate of ongoing movement.
11	Active with moderate but increasing rate of movement.
13	Active with high rate of movement, steady or increasing.
15	Active with high rate of movement with additional hazards.
20	Catastrophic slide is occurring.

Consequence Factor (ranked on a scale of 1 to 10)	
1	Shallow cut slope where slide may spill into ditches or fills where slide does not impact pavement, minor consequence of failure, no immediate impact to driver safety, maintenance issue
2	Moderate fills and cuts, not including bridge approach fill or headslopes, loss of portion of the roadway or slide onto road possible, small volume. Shallow fills where private land, water bodies or structures may be impacted. Slides affecting use of roadways and safety of motorists, but not requiring closure of the roadway.
4	Fills and cuts associated with bridges, intersectional treatments, culverts and other structures, high fills, deep cuts, historic rock fall hazards areas. Sites where partial closure of the road or significant detours would be a direct and unavoidable result of a slide occurrence.
6	Sites where closure of the road would be a direct and unavoidable result of a slide occurrence.
10	Sites where the safety of public and significant loss of infrastructure facilities or privately owned structures will occur if a slide occurs. Sites where rapid mobilization of large scale slide is possible

Table B – Geohazard Risk Level Factors – Rock Fall

Probability Factor (ranked on a scale of 1 to 20)	
1	Inactive, very low probability of fall occurrence
3	Inactive, low probability of fall occurrence.
5	Inactive, moderate probability of fall occurrence.
7	Inactive, high probability of fall occurrence (e.g. seasonal, following freeze/thaw cycles) and/or a fall has occurred in the past.
9	Active, falls occur after exceptional weather (e.g. the melting of greater than average snow accumulations or exceptionally intense precipitation), fall frequency is in the order of once a decade.
11	Active, one or two falls occur each year triggered by annually recurring weather conditions.
13	Active, several falls occur each year and/or the frequency of falls is increasing in comparison to equivalent time periods in previous years.
15	Active, many falls occur each year and/or the area producing rock falls is expanding. Ongoing or persistent rock falls during specific times of the year.
20	Active, a large volume of rock is surrounded by open cracks. Toppling or sliding of the displacing mass is accelerating. Sites where rapid movement of a large fall is possible.

Consequence Factor (ranked on a scale of 1 to 10)	
1	Rock fall contained by ditch if cleaned as required to maintain capacity.
2	Rock fall onto roadway removable by maintenance crews by hand or with shovels. Road closure not required. Minor damage to the road surface that can be repaired during annual patching and sealing of the road. Minor to no damage to vehicles being struck by falling rocks or striking rocks deposited onto road.
3	Rock fall onto road that could damage a vehicle (e.g. flat tire, dent body of vehicle). Rocks bounce or roll onto the road surface but likely not with a trajectory that would pass through the windows or windshield of a passing vehicle.
4	Individual rocks or the total volume of rocks deposited on the road large enough to: • Damage vehicles or cause accidents if struck by traffic or damage vehicles and injure occupants if they strike a moving vehicle. • Cause partial closure of the road or require a detour lane prior to cleanup. • Damage to the road surface may require temporary repair in order to re-open road.
6	Individual rocks or the total volume of rocks deposited on the road large enough to: • Damage/destroy vehicles and severely injure occupants if struck by traffic or damage/destroy vehicles and severely injure/kill occupants if they strike a moving vehicle. • Cause complete closure of the road, with a rough detour/diversion possible within hours to days. • Require days to weeks required to restore the road to normal service. • Possibly significant damage to the road surface that requires immediate repair.
8	Same as weighting of 6, but with several days required to develop a rough detour/diversion around the rockfall site.
10	Individual rocks or the total volume of rocks deposited on the road large enough to: • Damage/destroy vehicles and severely injure occupants if struck by traffic. • Bury vehicles if they strike a moving vehicle. • Cause complete closure of the road, with a temporary, rough detour or diversion possible in days to weeks. • Require complete reconstruction or rerouting of the road after the rockfall.

Table C – Geohazard Risk Level Factors – Erosion Sites

Probability Factor (ranked on a scale of 1 to 20)	
1	Inactive, very low probability of erosion, non-erodible soils or bedrock, physical or structural limitations to erosion expansion. Flat slopes, well vegetated.
3	Inactive, rills present, gullies forming. Reasonable vegetative soil cover.
5	Inactive, moderate probability of gully formation, mix of non-erodible and erodible soils, or active but very slow rate of erosion even with intense rain events. Moderately steep slopes.
7	Inactive, moderate probability of erosion or additional hazards, or active with barely perceptible erosion expansion from season to season and well defined erosion prone areas (confined flow). Gullies 2 m wide and 1 m deep.
9	Active erosion at moderate rainfall event levels. Gullies actively eroding road embankment or ditches. Mostly erodible soils present. Steep slopes with poorly established vegetative cover.
11	Active erosion at most rainfall event levels, Erodible soils. with little or no vegetative soil cover. Increasing rate of erosion as evidence by gully enlargement. Gullies 5 m wide and 2 m deep formed.
13	Active with high rate of erosion, steady or increasing. Very steep slopes, no vegetative cover..
15	Active with high rate of erosion with additional hazards.
20	Mass wasting of great volumes of soil is occurring, gullies 10 m wide and 4 m deep formed.

Consequence Factor (ranked on a scale of 1 to 10)	
1	Relatively small area of erosion involved confined to ditch or backslope. Less than 25 m of ditch or 100 sq.m. of slope affected.
2	Loss of portion of the roadway embankment possible. Blockage of culverts and deposition of silt in sensitive low areas within highway right of way is possible.
4	High fills or cut slopes being undermined by gullies. Sites where partial closure of the road or significant detours would be a direct and unavoidable result of a slide occurrence. Blockage of culverts highly likely, or damage to existing erosion and sediment control structures is or is likely to occur.
6	Sites where closure of the road would be a direct and unavoidable result of continued erosion. Sites within 500 m of a watercourse..
10	Sites where the eroded material could directly flow into fish bearing rivers or affect water quality and aquatic resources