ABSTRACT

TITLE:	Preliminary Characterization of Soil Properties: Florida River Landslide Complex, La Plata County, Colorado
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ABSTRACT: The Florida River Landslide Complex (FRLC) is located in the southern part of La Plata County approximately 1 km downstream from Lemon Reservoir (~263,900mE, 4,138,250mN, Z13) and covers an area over 0.5 km2. Much of the FRLC burned during the 2002 Missionary Ridge Fire and active landslides were observed by 2005. Previous studies of this landslide complex (Schulz et al., 2006) focused on assessing landslide activity using subsurface sampling, geologic mapping, and ground displacement monitoring. The purpose of this research was to: (1) determine the clay mineralogy; (2) estimate the engineering properties of the soil; and (3) evaluate the swelling potential of the soil for a relatively steep section of the FRLC. A soil sample collected in May 2012 was determined to have a Liquid Limit (LL) of 23.5%, a Plastic Limit (PL) of 18.5%, yielding in a Plasticity Index (PI) of 5%. Based on the LL and PL, the soil was classified as a low plasticity, lean clay (CL-ML). The relatively low PI and low LL moisture content indicate a low swelling soil potential. A plot of "PI versus Percentage of Clay in the whole sample" (clay percentages range from 40.6% to 79.4%) similarly supports a low swell potential. XRD clay speciation data verified the lack of Smectite (swelling) clay in five soil samples; the randomly ordered (R0) I/S clay fraction (with 90% Smectite clay) never exceeded 3.6% of the clay fraction (two samples contained less than 1%). In three of the soil samples, the R1, Mixed layer I/S (with 30% Smectite clay) fraction ranged from 46 to 63%. However, Kaolinite was the predominant clay fraction in the majority of the samples. Based on preliminary data from this study, which focused on only one relatively steep section of the FRLC, it seems unlikely that swelling soil will play a significant role in aiding slope failure under elevated moisture conditions.