Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2019.23846

157 (2019) 209–218
July

Deformation mechanism of Area C landslide in Suijiang, Xiangjiaba Reservoir, Yunnan Province, China

Fuchu Dai[a,b], Wenping Dong[a,*], Zhiquan Huang[a], Jiahua Lei[a], Hongying Zhang[b]

[a]*School of Resources and Environment, North China University of Water Resources and Electric Power, Zhengzhou 450045, China, email: 812971359@qq.com (W. Dong)*
[b]*Key Laboratory of Urban Security and Disaster Engineering, Beijing University of Technology, Beijing 100124, China*

Received 22 October 2018; Accepted 15 January 2019

ABSTRACT

The Xiangjiaba project is located in the Shuifu County, Yunnan Province. It is situated approximately 157 km away from the Xiluodu project, 33 km away from the Yibin City and 1.5 km away from the Shuifu County. The Area C landslide of Suijiang County, with a volume of 47 million m^3, is located on the southern bank of the Xiangjiaba project. The landslide body has been experiencing persistent deformation with a recorded maximum horizontal displacement of 1,480 mm up to December 2015, posing a critical threat to the lives and properties of local residents. Based on the data collected from detailed geological surveys and three-year monitoring, this paper presents the findings of an in-depth study about deformation characteristics and influence factors of Area C landslide. The findings indicate that: the high southern terrain, steep back rock, wavy-bedded sandstone and mudstone interbeds and hydrophilic soil provide necessary conditions for the landslide. The Area C is located in ancient landslide sites, a secondary shear exists in its front. During the rainy season, the displacement rate of Area C increased sharply, and the deformation is more closely associated with the sudden drop of reservoir water than with the sudden rise. The safety factor decreases under reservoir inundation and rainfall. Continuous creep contributes to the movements of Area C landslide, though the movements are slow. The possibility of high-speed slip is very small. Relevant measures should be taken to protect the safety of lives and properties of the immigrants.

Keywords: Landslide; Deformation mechanism; Rainfall; Reservoir water

* Corresponding author.