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Eaglepointe 2014 Landslide

Executive Summary

# Summary

Our case study looks at the Eaglepointe landslide that occurred in North Salt Lake on August 5, 2014. This landslide destroyed one home and put several others at risk in the Eaglepointe subdivision that surrounds the slope. The slope sits on a reclaimed gravel pit underlain by sand and gravel sediments. The upper part of the slope corresponds to Lake Bonneville’s highstand shoreline. Prior to the slide, in the mid-2000s, Utah Geological Survey (UGS) had documented small shallow landslides around the area. We looked at several geotechnical reports in order to obtain information about what caused the slide.

# Landslide Description

At about 6:00 a.m. on the morning of August 5, 2014, a large landslide occurred above Parkway Drive in the City of North Salt Lake, Davis County. The landslide involved an engineered slope that had been part of a gravel pit in the 1990s, but has since been reclaimed and partially developed into the Eaglepointe subdivision. The catastrophic failure of the reclaimed slope above Parkway Drive resulted in a 60-foot-high main scarp above a landslide mass about 500 feet wide and 500 feet long that moved downhill several tens of feet. Preliminary estimates suggest a landslide volume of 300,000 to 400,000 cubic yards, based on an assumed depth of between 30 and 50 feet. The pre-slide slope had a local relief (change in elevation) of about 200 feet and an average grade of approximately 45 percent.

Only one house was directly damaged. The home was pushed off its foundation and destroyed. A tennis court was also damaged and a backyard and part of a hiking trail were carried away by the landslide. Immediately after the landslide, 27 homes were evacuated. No one was injured during the landslide.

# Geotechnical Reports

 Several geotechnical reports and studies were conducted on this particular slope. We used three reports in particular. The first report was the AGRA Earth & Environmental: Preliminary Geotechnical/Engineering Geology Evaluation (1998). This was written as a preliminary report for the Eaglepointe development. We also studied the Applied Geotechnical Engineering: Geological and Geotechnical Report (2003). Further investigation for the proposed Eaglepointe development was needed in 2003 and that is why this report was created. The final study we looked at was the GSH Geotechnical Inc: Report Supplemental Geotechnical Study (2013). This was conducted as the development was proposing an expansion.

# Findings and Conclusions

 In studying and researching the geotechnical reports, several things were observed. First, the slope stability analysis from all three reports used a total stress procedure with no groundwater in the slope to determine the factor of safety. The 2003 geotechnical report from AGEC did point out that if water was introduced to the slope, then there could be an issue with stability and the 2013 report from GSH Geotechnical analyzed the actual slope that failed, but did not consider a saturated slope. Looking at the rainfall for the area during the months just before the slide, it was high but not unusually so. It is possible that an increased rainfall coupled with an inaccurate slope stability analysis could have led to the landslide.

# References

* AGEC, Inc., *Geologic and Geotechnical Report* (2003)
* AGRA Earth & Environmental, Inc., *Preliminary Geotechnical/Engineering Geology Study* (1998)
* GSH Geotechnical, *Supplemental Geotechnical Study* (2013)
* Utah Geological Survey < http://geodata.geology.utah.gov/pages/home.php>