

## Seismologic long-time monitoring of the inner burden dump in Schlabendorf/South with hazards of soil-liquefaction causing deformations of the terrain surface

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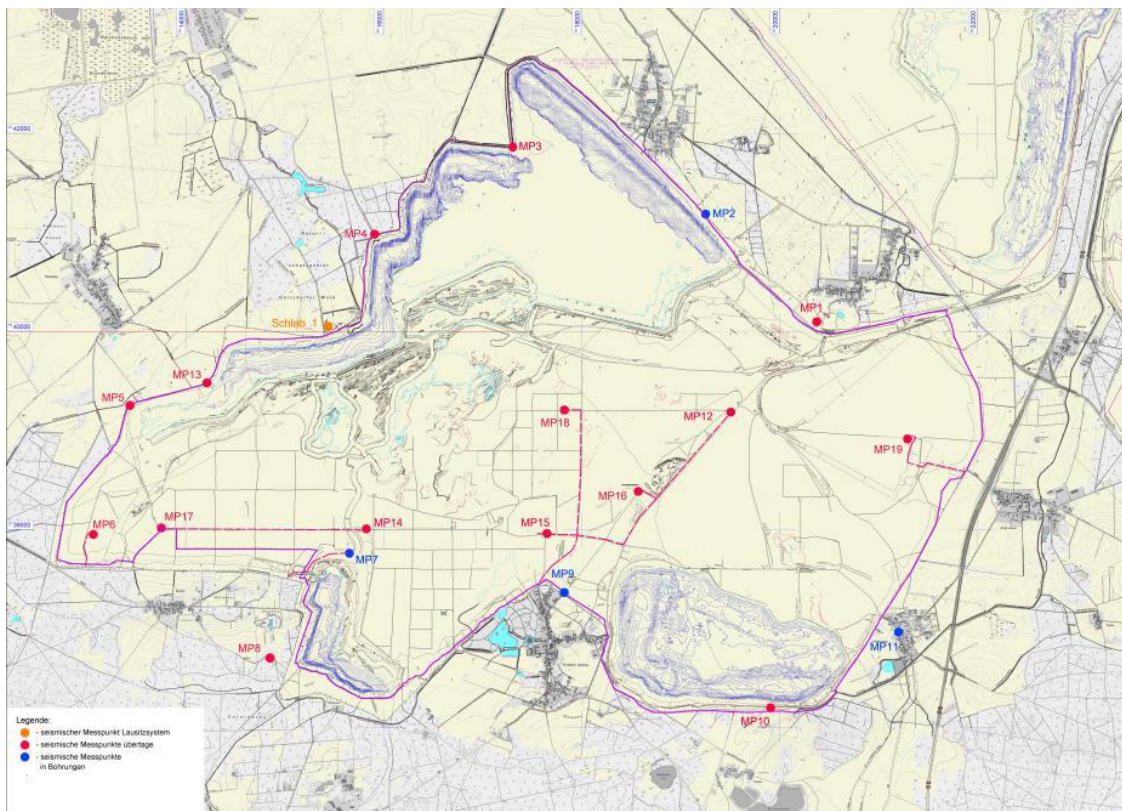
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### Extended Abstract

In the area of the former open brown coal pits in the Lausitz, there exist a number of prohibited inner burden dumps. These areas are always tens of square kilometers large, which are not accessible for the forest, agriculture or other use. The reasons for the prohibition are the slip hazards of the overburden. The seismologic monitoring is one possible solution how to detect mass movements in real time and give the operator of an inner burden dump the chance to observe the slip contemporary.

Beginning in 2013 to 2014 a seismologic network with 20 seismologic stations was installed around and on the inner burden dump Schlabendorf/South. The seismologic stations were supplied by solar power and work with a LTE(4G) mobile phone data link. Since the starting time a number of seismologic events have been monitored. Not all of the seismologic events could be observed from the surface because of the considerable depth of the events. During operation time, a number of parameter and correlations from seismologic events were discovered.



*Figure 1: Seismologic monitoring Network*

During the monitoring time, a number of seismic events occurred with visible mass move-ments. Some of the seismicologic events took place in subsequent events to each other, which could be interpreted as connected events bursts from the underground to the surface. The geotechnical impact on the surface could be a sinkhole or a surface displacement.

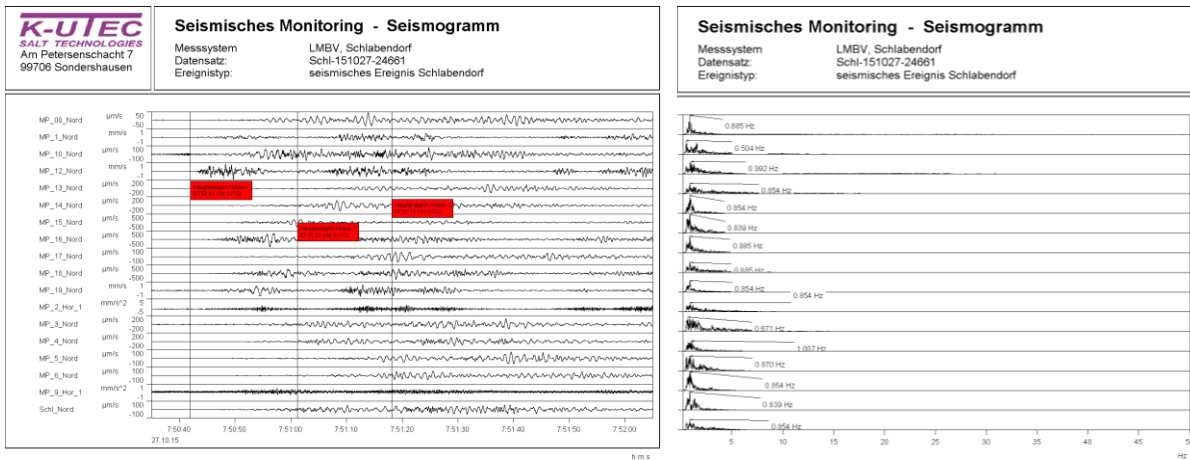


Figure 2: seismic events and frequency parameter causing the geotechnical event

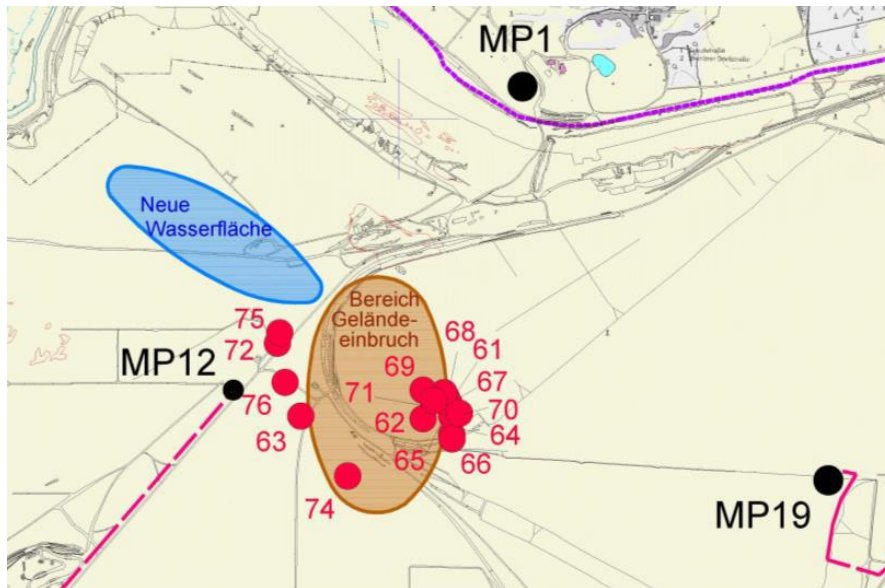


Figure 3: seismic localization compared to the slides residues on the surface

With help of the discovered parameters, it should be possible to support the geotechnical model of the inner burden dump as well as to help to understand the processes, which lead to such slides. After almost two years of seismicologic monitoring, it seems that the accompanied weather conditions have a great influence on the potential for such slide hazards (Terrain Deformation Hazards). Most of the events occur during the “wet” seasons in spring or autumn. During this time the groundwater level rose which could have supported the slide hazard.

Key words: inner burden dump, groundwater level, slide hazards (Terrain Deformation Hazards), seismo-logic events, soil-liquefaction