# Berm Monitoring System case study

## Common Berm Measuring Method

The current, most common method of determining berm heights is to rely on a reference object. In this case, a large traffic cone of known height is used. Standard practice is for one or two cones to be placed against the berm at either end of the tipping face. The dozer operator and relevant supervisors are then able to use the cones as a reference object, however this method is not accurate and brings with it many uncertainties.

The cone needs to be placed near the tipping face, however this results in the cone being near dumping activity and the cone becomes damaged or partially covered. Figure 1 below illustrates a partially covered cone, and the cone can no longer function as a reference object due to floor elevation being higher than the base of the cone.

*Figure 1 Partially Covered and Damaged Cone*

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A 2nd flaw of using the cone as a reference object is determining the most useful placement of the cone. Multiple cones cannot be placed along regular intervals along the tipping face, since they will be an obstruction to the tipping activities and will ultimately be destroyed. Current practice is for the cones to be placed at either end of the tipping face. In some cases, this results in the cones being extremely far apart and cannot be efficiently used as a reference object.

Figure 2 below illustrates a cone placed at substantial distance from the berm and can simply not be used to ascertain if the berm is compliant or not.

*Figure 2 Perspective Error*

Using the cone as a reference also introduces human error and judgement. Depending on the supervisors view of the berm and berm-cone relation the berm may look compliant, when in fact it is an error in perspective.

The BMS solution removes this human error and is able to provide a quantitative measure of the berm compliance.

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