of overburden. As pointed out in section 10 a surface detector needs to a) have sufficiently data acquisition bandwidth to collect all events near the beam spill time, b) eliminate cosmic ray tracks so that the beam events can remain pure, c) tag events due to cosmic rays so that no cosmic ray induced events mimic an in-time beam event. These requirements force surface detector to be a segmented detector with active cosmic ray veto shielding.

- Background rejection: There are two contributions to the background from the neutrino beam: neutral current events as well as contamination of electron neutrino events. The narrow band nature of the neutrino beam is important for rejection of both of these backgrounds. The neutral current events which tend to have a falling energy distribution can come from both the main peak of the neutrino spectrum and the tails. In the case of location (2) the large kaon peak will contribute background. The ν_e contamination has a broad distribution for both off-axis locations [16]. To use the narrow band nature of the beam effectively to suppress backgrounds, the detector must have the capability to measure neutrino energy (total charged current event energy) with good resolution, which is approximately the same as the width of the narrow band beam. It should also be able to reject π^0 or photon induced showers.