For a given exposure the tissue near bone receives a dose different than tissue remote from bone. For megavoltage photon beams this effect is attributed to increased Compton and pair-production interactions due to the higher density and atomic number of bone. Clinically, this is an important consideration for the living bone marrow tissue in total body irradiation at high photon energies. Commonly used dose calculational algorithms in treatment planning systems fail to predict the behavior near the bone-tissue interface. An accurate experimental determination of the magnitude and extend of this effect into tissue is complicated because it occurs in a region of non-charged particle equilibrium. We obtain dose measurements near the bone-tissue interface with a parallel plate chamber in a solid-water phantom for 6 and 18 MV photon irradiation under TBI conditions. To measure the bone marrow dose, LiF TLDs are positioned within a bone marrow type phantom consisting of a 1 mm thick lucite sheet sandwiched between bone-equivalent plastic slabs surrounded by solid-water. The bone marrow dose is measured for various bone thicknesses for 6 and 18 MV exposures under TBI conditions. Monte Carlo calculations for the bone marrow dose using the MCNP code are obtained and compared to the TLD and ionization chamber results. Preliminary results show good agreement between measurements and calculation with a 1 to 3 % decrease dose to bone-marrow and a 3 to 6 % increase in bone marrow dose for 6 and 18 MV, respectively. A discussion of these results will be presented.