



Consider the -160 kV surface.

This is an equipotential surface (the potential everywhere on it is -160 kV) and it could be due to a charge Q placed at the centre of the sphere. The fact that it is a 'hard' surface is irrelevant here.

If this surface is at 0.1 m from Q it follows that an equipotential surface double the distance from Q (i.e. the one at P 0.2 m from Q) will be at a potential of -80 kV (half that at the surface 0.1 m from Q).

Doubling the distance will halve the potential ($V = [1/4\pi\epsilon_0]Q/R$) where R is the distance of the point from the centre of the sphere.