Therefore, the backfill material may introduce a considerable amount of non-degradable and not environmentally friendly constituents into the ground.

From the above it becomes clear that there is still a need for backfill materials, which comprise no or at least reduced amounts of environmentally questionable components while still having long-term service life.

Therefore, the object of the disclosure is to at least partially overcome the deficiencies of known backfill materials.

The object of the disclosure is solved, in one aspect, by means of a conductive and swellable backfill material for earthing applications comprising a conductive material selected from the group of graphite, coke powder and a combination thereof, a polyacrylamide powder, a binder comprising cement, and, optionally, a salt selected from the group of magnesium sulfate, sodium sulfate and a combination thereof.

The backfill material according to the disclosure is specifically designed to swell upon contact with water, which can be present by means of soil water, rain or manual application upon installation of the backfill material.

The swelling process allows the backfill material to fill up any voids or air pockets which might be present in an earth hole in which the backfill material is filled. Also, this effect reduces the amount of backfill material necessary to fill up an earth hole of given volume and provides for an especially homogenous backfill material.

Furthermore, the swelling process provides an enhanced contact with a metallic rod or electrode used in an earth termination system in conjunction with the backfill material, e.g. a rod comprising or consisting of copper, aluminium

and/or stainless steel. At the same time, the enhanced contact reduces the extent of corrosion of the metallic rod or electrode.

The high amount of swelling of the backfill material according to the disclosure allows for retaining any absorbed water for extended periods of time, thereby also reducing the risk that the backfill material dries out which could lead to crack formation and thereby to an increase in resistivity. With other words, the backfill material according to the disclosure is especially long-term stable.