We introduce the notion of a semi-Bousfield class in a tensor triangulated category endowed with a reasonable t-structure. In the case of the derived category of a noetherian scheme, we construct an embedding of the lattice of all (not necessarily monotone) perversities to the semi-Bousfield lattice. This embedding is surjective if and only if the scheme is regular. In the singular case, we are still able to describe its image precisely as consisting of the semi-Bousfield classes of objects of finite Tor dimension. We explain how this can be viewed as a common generalization of two important results: The stratification of Neeman and Alonso-Jeremías-Souto and the t-structure classification of Alonso-Jeremías-Saorín and Dubey-Sahoo.