1 Differential Form of Gauss's Law

For an infinitesimally thin cylindrical shell of radius b with uniform surface charge density σ, the electric field is zero for $s < b$ and $\vec{E} = \frac{\sigma b}{\epsilon_0 s}\,\hat{s}$ for $s > b$. Use the differential form of Gauss' Law to find the charge density everywhere in space.