Simplify the expression using positive exponents only.

$$\left(\frac{a^{-6} b}{a b^2}\right)^{-2} = \frac{a^{12} b^{-2}}{a^{-2} b^{-4}} = \frac{a^{12} a^{2} b^{4}}{b^2} = a^{14} b^2$$