Equations used in geothermal power capacity reserve estimates

μ (nu) is the mean in log units

α (sigma) is the variance in log units

Lognormal distribution inputs for area

To calculate μ and α for the area based on user-specified P90 and P10 input parameters:

μ_{area} = $0.5(ln\text{P90}_{area} + ln\text{P10}_{area})$

α_{area} = $(ln\text{P10}_{area} - ln\text{P90}_{area})*0.434$

Lognormal distribution inputs for power density

To calculate μ and α for the power density based on user-specified P90 and P10 input parameters:

$\mu_{powerdensity}$ = $0.5(ln\text{P90}_{power\_density} + ln\text{P10}_{power\_density})$

$\alpha_{powerdensity}$ = $(ln\text{P10}_{power\_density} - ln\text{P90}_{power\_density})*0.434$

Lognormal distribution inputs for MWe capacity

To calculate μ and α for MWe capacity:

$\mu_{MWe\ capacity}$ = $\mu_{area} + \mu_{power\_density}$

$\alpha_{MWe\ capacity}$ = $0.5(\alpha_{area}^2 + \alpha_{power\_density}^2)$

Lognormal distribution definition (from Wikipedia)

Let Z be a standard normal variable, and let μ and $\alpha > 0$ be two real numbers. Then, the distribution of the random variable

$X = e^{\mu + \alpha Z}$

is called the log-normal distribution with parameters μ and α.