

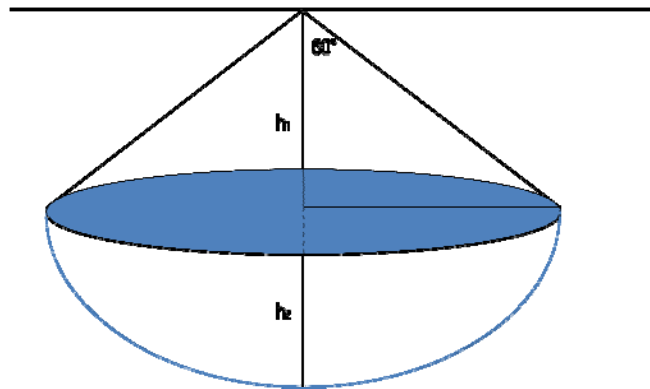


Search Volume of the LifeLocator® III+

Search Volume Explained

Energy from the sensor placed on the ground radiates in a cone pattern downward. Of course as the energy travels, it is attenuated until it reaches some minimally detectable level. The level is defined by an arc under the antenna such that in 3 dimensions, the arc becomes a “cap.”

Imagine an ice cream cone (with a scoop of ice cream) upside down and you get the picture.



The volume of the cone is defined by $\frac{1}{3} \cdot \pi \cdot r^2 \cdot h_1$

The volume of the “cap” is defined by $\frac{1}{3} \cdot \pi \cdot h_2^2 \cdot (3r - h_2)$

Where:

h is the height of the cone and the cap (and the sum of h_1 and h_2 is the vertical penetration depth of the LL3+)

r is the radius of the radiated energy at the cone and cap interface.

The angle at which energy is radiated is approximately 80 degrees from vertical. Let’s assume a margin of safety and set the angle at 60 degrees.

The maximum penetration depth of the LL3+ is 10 meters ($h_1 + h_2$). This depth is dependent on the debris covering the victim – excessive metal content will reflect energy, some materials may conduct (and therefore attenuate) energy – in either case these conditions may restrict the maximum penetration depth to less than 10 meters.

Assuming a 10 meter depth of penetration, the volume of the cone is 393 m^3 , and the volume of the cap is 654 m^3 , for a total search volume of 1047 m^3 . In English units, this equals just over 28,000 cubic feet.