An earthen gravity settling basin can remove 50% or more of the solids from liquid swine manure while providing solids storage for up to 12 months between cleanouts. The basin top width should be no more than 100 feet with a length-to-width ratio near 3:1 and a liquid depth of 8-10 feet. The basin contents should be thoroughly agitated and removed for land spreading either by liquid manure spreader or slurry irrigation. The following design example for North Carolina conditions assumes an earthen gravity manure settling basin more than 1000 feet from the nearest residence for 6 months solids accumulation; followed by an anaerobic treatment lagoon and 6 months storage of urine, excess water usage and lagoon surface rainfall surplus. It does not include storage for freeboard, a 25-year storm, or fresh water used for pit flushing or recharge.

Settling Basin:

\[
0.55 \text{ gal/135 lb hog/day} \times 183 \text{ days} = 100 \text{ gals /135 lb hog}
\]

\[
/7.48 \text{ gals/ft}^3 = 13.4 \text{ ft}^3 /135 \text{ lb hog}
\]

\[
/135 \text{ lb hog} = 0.10 \text{ ft}^3/\text{lb hog}
\]
Anaerobic Treatment Lagoon: (50% VS reduction in settling basin)

design treatment vol: $0.5 \times 1.0 \text{ ft}^3/\text{lb hog} = 0.50 \text{ ft}^3/\text{lb hog}$

sludge storage: $0.5 \times 0.5 \text{ ft}^3/\text{lb hog} = 0.25 \text{ ft}^3/\text{lb hog}$

temporary storage: $0.5 \text{ ft}^3 - 0.10 \text{ ft}^3 = 0.40 \text{ ft}^3/\text{lb hog}$

(183-day liquid storage minus settled solids)

total volume: $= 1.15 \text{ ft}^3/\text{lb hog}$

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