

US EPA ARCHIVE DOCUMENT

APPENDIX L

WASTE VOLUME QUANTITIES



Client: Clinton Landfill, Inc.

Project: Clinton LF No. 3 Chemical Waste Unit

Proj. #: 128017

Calculated By: TDS

Date: 9/20/07

Checked By: JPV

Date: 9/21/07

TITLE: VOLUME CALCULATIONS FOR THE CLINTON LANDFILL NO. 3

Problem Statement

Determine the amount of airspace cubic yards (ascy) for the new chemical waste landfill unit at the Clinton Landfill No. 3 and the soil balance for the facility.

Given

- AutoCAD Land Desktop 4 Software.
- Design Drawings contained within this application.

Assumptions

- The total area of the waste footprint of the Clinton Landfill No. 3 is approximately 157.45 acres. The area of the chemical waste landfill footprint within the Clinton Landfill No. 3 is approximately 22.58 acres.
- The peak final landform elevation is assumed to be 870 feet MSL. The peak final chemical waste unit elevation is approximately 815 feet MSL.
- The elevation of the chemical waste landfill sumps is approximately 664 feet MSL.
- All reported waste volumes are net (exclude final cover).
- It was assumed that the final cover for the landfill is 4 feet thick.

Calculations:

Volume calculations were performed using AutoCAD Land Desktop 4 functions. Volumes were calculated from the top of waste to the top of the leachate collection system. The volume of the landfill cell are summarized below.



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Summary of Proposed Volumes at the Clinton Landfill No. 3	
Area	Airspace Volume (ascy)
Total Volume of Clinton Landfill No. 3 - Chemical Waste Unit	2,552,925
Total Volume of Clinton Landfill No. 3	31,812,491

Calculation Check

The attached spreadsheets were used to check the volumes calculated from AutoCAD. The spreadsheet used the modified prismatic formula to calculate the volume of the landfill based on the Base, Liner, and Plateau areas. The following table compares the AutoCAD numbers with the modified prismatic formula. The comparison table demonstrates that the calculated values are within an acceptable range.

Volume Comparison Table for Indian Creek Landfill No. 2 Expansion			
	AutoCAD Volume (ascy)	Modified Prismatic Formula (ascy)	Percent Difference (%)
Total Waste Volume	2,552,925	2,491,460	2.41

Results

The above calculation demonstrates that the Clinton Landfill No. 3 - Chemical Waste Unit will provide a capacity of 2,552,925 ascy and the total volume of the Clinton Landfill No. 3 is 31,812,491 ascy.

92007.txt

Site Volume Table: Unadjusted

Cut	Fill	Net	Method
cu.yds	cu.yds	cu.yds	

Site: clinton

Stratum: comp_waste_vol_91107	leachate grades	top of waste	
17	31812508	31812491	(F) Composite
Stratum: comp_waste_chemical_92007	top of waste	chemical	leachate grades
2552942	17	2552925	(C) Composite

Volume Calculations for Clinton Landfill No. 3 \ Chemical Waste Landfill

Please enter data only in white cells

Geometry of Landfill	
Below Grade Slope (X:1)	3
Above Grade Slope (X:1)	4
Plateau Slope (X:1)	20
Base Footprint Elevation (feet MSL)	690
Bottom of Waste Elevation (feet MSL)	664
Top of Waste Elevation (feet MSL)	812
Elevation of Plateau (feet MSL)	810
Area of Base Footprint (acres)	22.58

Peak Landfill Elevation 815 feet MSL

Areas Calculated by AutoCAD			Volume Calculations			
Base Footprint Area (sq. ft)	Below Grade Area (sq. ft)	Plateau Area (sq. ft)	Below Grade Volume (ascy)	Above Grade Volume (ascy)	Plateau Volume (ascy)	Total Landfill Airspace (ascy)
983,585	628,434	24,117	769,800	1,721,064	595	2,491,460