Volume = (6 holes x 0.0055 ft²/hole) (2ft/sec) (255 min) (448 gpm/cfs)
Volume = (0.033) (2) (255) (448) = 7540 gallons

D.2.3.B. Loss around edge of non-vented cover

1. Size of opening:

As the weight of manhole lid will generally hold it in place until internal pressures exceed 0.4 pounds/sq. in., loss occurs through imperfections, grit, etc. between the lid and manhole frame. Observations are generally a vertical ring of water from side gap between the lid and frame of approximately ¼ inch width.

Area = (π) (D) (¼ inch) (1/12 in/ft)
= (3.14) (2ft) (1/4) (1/12)

Area = 0.131 ft²

2. Velocity through gap
(see vertical plume guide above, D.3.A.2.)

3. Time - convert to minutes

Example: Manhole with 4-inch plume around edge for 2 hours, 15 minutes

Volume (Gal.) = (Area) (Velocity) (Time) (448 gpm/cfs)
= (0.131 ft²) (4.6 ft/sec) (135) (448)
= 36,445 gallons

D.2.3.C. Loss from tilted cover

1. Size of opening:

Some estimate has to be made in the field concerning how much gap exists in order to do this calculation. For the following amounts of lift of one side, the areas are as follows:

A = (π) (D) (in of lift) (1/12 ft/in) (1/2)
A = (3.14) (2ft) (in. of lift) (1/12) (1/2)
A = 0.262 (in. of lift)

Lift (inches)	Area (ft²)
1	0.262
2	0.524
3	0.786
4	1.048

2. Velocity through opening

This must be estimated from visual observation. A low rate would be 2/ft/sec, moderate rate at 4 to 5 ft/sec, high rates up to 7 ft/sec. Over 7 ft/sec, the lid will