A problem of fluid mechanics

in keeping with Tantalus, Sisyphus, and the Danaids

(February 2025)

PREMISE:

I. A double Olympic-sized swimming pool with limited runoff management contains 330,000,000 cubic inches of pure unadulterated water [1];

II. Said double Olympic-sized swimming pool with limited runoff management contains 11,400,000 cubic inches of undesirable adulterated water;

III. Each month, an additional 85,000 cubic inches of undesirable adulterated water enter the double pool, half permeating surreptitiously through the perimeter and half through the main inlet;

IV. Said undesirable adulterated water is believed to corrupt and poison the content of pure unadulterated water;

V. In the 30 days past, under new management, 37,660 cubic inches of undesirable adulterated water have been removed.

QUESTIONS:

1. At the current rate of removal, by how much will the amount of undesirable adulterated water decrease in the next 47 months of the tenure of new management?
2. What is the minimum rate of removal that would allow removing all (100%) undesirable adulterated water within the next 47 months?

YOUR ANSWERS:

1: _____cu.in.	**2: _____cu. in. per month**

[1] *Doctoral candidates are permitted to substitute any other unit of their choice, e.g. apples or oranges in a large barrel, or even human beings in a large country.*