

**Environmental
Resources
Management**

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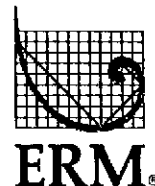
MAR 25 1999

DEPT OF ENV PROTECTION
WEST PALM BEACH

March 1, 1999

Project No. 1311277.21

Mr. Scott Schneider
Safety-Kleen Systems, Inc.
5610 Alpha Drive
Boynton Beach, Florida 33426



RE: Tank Farm Containment Volume; Medley, Florida Facility

Dear Scott:

In accordance with your recent authorization, we have completed the calculations of the containment volume of the tank farm at Safety-Kleen's Medley, Florida branch. The volume calculations were performed as outlined in our Proposal No. 99456, dated February 22, 1999, and take into account:

- The existing containment shell (V_C);
- The containment sump (V_S);
- The displaced volume of the three 19,000 gallon vertical storage tanks (V_{3T});
- The displaced volume of the single 10,000 gallon horizontal tank (V_{HT});
- The volume of the concrete tank pads (V_P);
- The volume of the metal enclosures for two tank charging stations (V_{CS}); and
- The volume of rainfall associated with a 25-year rain event (V_{RAIN}).

Please note that Title 40 of Code of Federal Regulations (CFR), Part 265 (40 CFR 265.193(e)(2)(ii)) requires accounting for precipitation associated with a 25-year, 24-hour rain event. The containment volume was calculated with and without accounting for the rain event, as documented in Table 1 and the attached calculations. The total calculated available containment volume, including the 25-year rain event, is 24,900 gallons. This volume is greater than the volume of the single largest storage tank located inside the containment area, which is 19,000 gallons.

Mr. Scott Schneider
March 1, 1999
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If you have any questions regarding these calculations, please feel free to give me or Mike Starks a call.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew Wright", with a stylized flourish at the end.

Matthew Wright, E.I.T.
Project Manager

c: Mike Starks - ERM

TABLE 1
SUMMARY OF CALCULATED CONTAINMENT VOLUMES

Description	Variable	Volume (gal)
Existing containment shell	V_c	50,900
Containment sump	V_s	42.3
Displaced volume of the three 19,000 gallon vertical storage tanks	V_{3T}	5,440
Displaced volume of the single 10,000 gallon horizontal tank	V_{HT}	2,506
Supports for horizontal tank	V_s	529
Concrete tank pads	V_p	3,480
Metals enclosures for two tank charging stations	V_{CS}	357
25-year, 24-hour rain event	V_{RAIN}	13,800
Total available containment volume (without the 25-year, 24-hour rain event)	$V_{TOTAL(w/o RAIN)}$	38,600
Total available containment volume (with the 25-year, 24-hour rain event)	$V_{TOTAL(w/ RAIN)}$	24,900

Notes:

$$V_{TOTAL(w/o RAIN)} = V_c + V_s - V_{3T} - V_{HT} - V_s - V_p - V_{CS}$$

$$V_{TOTAL(w/ RAIN)} = V_c + V_s - V_{3T} - V_{HT} - V_s - V_p - V_{CS} - V_{RAIN}$$



Total Volume of Secondary Containment for Tank Farm

$$\text{Total Volume} = \text{Vol}_{\text{cont}} + \text{Vol}_{\text{sump}} - \text{Vol}_{\text{TANKS}} - \text{Vol}_{\text{PADS}} - \text{Vol}_{\text{CHARGE STATIONS}}$$

Containment Volume

2 in. floor slope

$$V_c = [3'(38.85') + \frac{1}{2}(38.85')(0.167')] 56.8'$$

$$= 56.8'(116.55 \text{ ft}^2 + 3.24 \text{ ft}^2)$$

$$= 6,804.07 \text{ ft}^3 (7.48 \text{ gal/ft}^3)$$

$$V_c = 50,894.4 \text{ gal}$$

Sump Volume

$$V_s = \pi r^2 h$$

$$= \pi \left(\frac{1.96'}{2} \right)^2 (1.88')$$

$$= 5.66 \text{ ft}^3 (7.48 \text{ gal/ft}^3)$$

$$V_s = 42.32 \text{ gal}$$

Tank Volume

Total Tank Volume = Volume of the 3 upright (19,000 gal) tanks
+ Volume of the horizontal tank

Upright (19,000 gal) tanks:

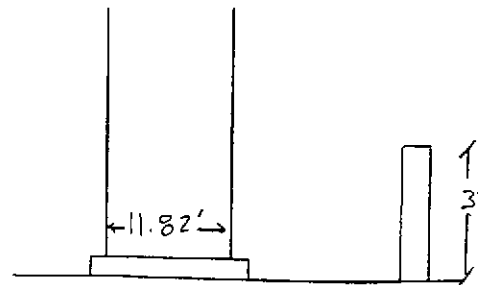
$$V_{3T} = 3(\pi r^2 h)$$

$$= 3\pi \left(\frac{11.82'}{2} \right)^2 (3 \div 0.79')$$

$$= 3\pi (34.93 \text{ ft}^2) (2.21 \text{ ft})$$

$$= 727.51 \text{ ft}^3 (7.48 \text{ gal/ft}^3)$$

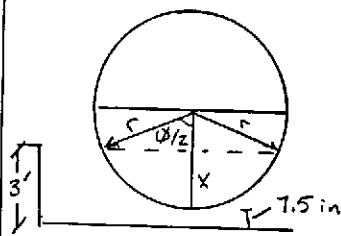
$$V_{3T} = 5,441.77 \text{ gal}$$



Note: Drawing not to scale



Volume of horizontal tank:



$$x = \frac{36 \text{ in} - 7.5 \text{ in}}{12 \text{ in/ft}} = 2.38 \text{ ft}$$

$$\cos \phi/2 = \frac{r-y}{r} = \frac{4' - 2.38'}{4'} \quad \phi/2 = 66.03^\circ$$

$$\phi = 132.06^\circ = 2.305 \text{ rad}$$

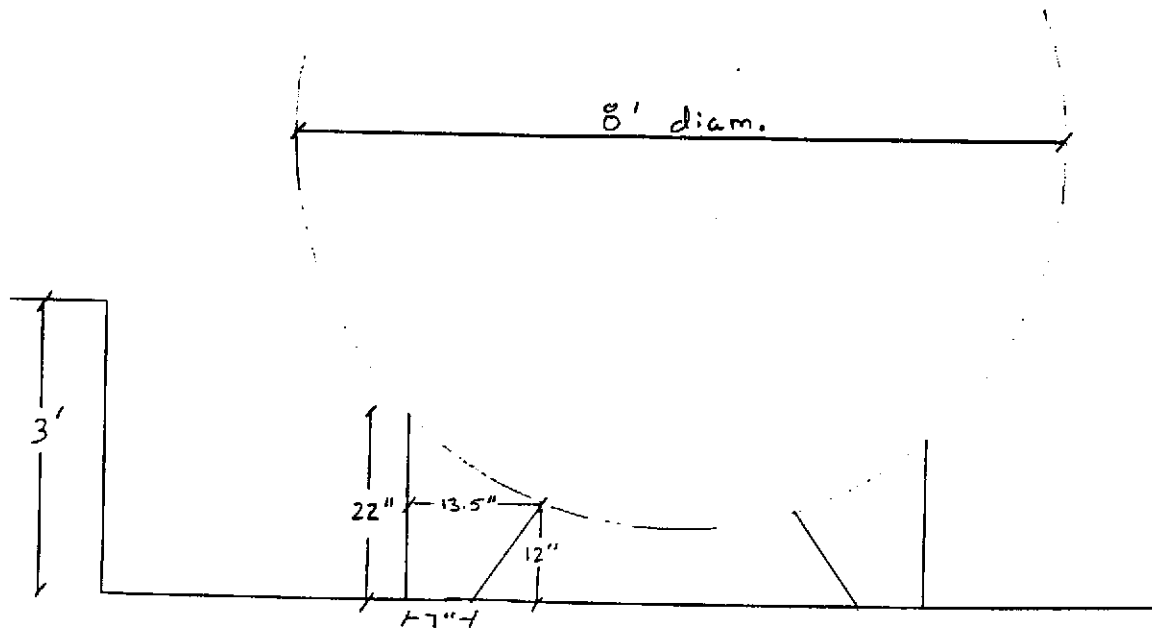
$$\frac{\pi r^2}{A_{\text{wedge}}} = \frac{2\pi}{\phi} \quad \frac{16 \text{ ft}^2 \pi}{A_{\text{wedge}}} = \frac{2\pi}{2.305}$$

$$A_{\text{wedge}} = 18.44 \text{ ft}^2$$

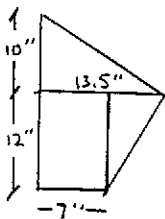
$$A_{\text{HT}} = 18.44 \text{ ft}^2 - 2 \left[\frac{1}{2} (1.625)(3.655) \right]$$

$$A_{\text{HT}} = 12.56 \text{ ft}^2 \quad V_{\text{HT}} = A_{\text{HT}} L = 12.56 \text{ ft}^2 (26.8 \text{ ft})$$

$$V_{\text{HT}} = 335.0 \text{ ft}^3 (7.48 \text{ gal/ft}^3) = 2,505.8 \text{ gal}$$



Area of Supports :



$$A_s = (7/12') (1) + \frac{1}{2} (10/12') (13.5/12') + \frac{1}{2} (1) (6.5/12')$$

$$A_s = 1.32 \text{ ft}^2$$

$$V_s = 1.32 \text{ ft}^2 (26.8 \text{ ft}) 2$$

$$V_s = 70.75 \text{ ft}^3 (7.48 \text{ gal/ft}^3)$$

$$V_s = 529.22 \text{ gal}$$

Total Volume of Tanks

$$V_T = V_{HT} + V_{3T} + V_S$$

$$V_T = 2,505.8 \text{ gal} + 5,441.77 \text{ gal} + 529.22 \text{ gal}$$

$$V_T = 8,476.79 \text{ gal}$$

Volume of Pads

$$V_P = 3(14 \text{ ft})^2 (9.5/12')$$

$$V_P = 465.5 \text{ ft}^3 (7.48 \text{ gal/ft}^3)$$

$$V_P = 3,481.94 \text{ gal}$$

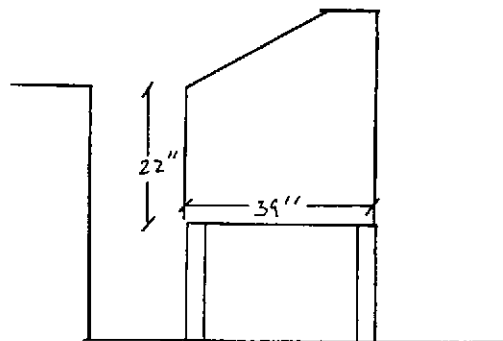
Note: the height of the tank pads ranged from 9 in to 10 in with an average of 9.5 in

Volume of Charging Stations

$$V_{CS} = 2(39/12')(22/12')(4')$$

$$V_{CS} = 47.67 \text{ ft}^3 (7.48 \text{ gal/ft}^3)$$

$$V_{CS} = 356.55 \text{ gal}$$



Note: drawing not to scale



Total Volume at Containment

Not taking the 25yr 24hr rain event into account:

$$V_{Total} = V_c + V_s - V_r - V_p - V_{cs}$$

$$V_{Total} = 50,894.4 \text{ gal} + 42.32 \text{ gal} - 8,476.79 \text{ gal} - 3,481.94 \text{ gal} - 356.55 \text{ gal}$$

$$\underline{V_{Total} = 38,621.44}$$

With the 25yr - 24hr rain event

$$V_{Total} = 38,621.44 - V_{Rain}$$

$$\underline{V_{Rain}}$$

Total rainfall for the 25yr - 24hr rain event = 10 in.

$$V_R = 56.8' (38.85') (10/12')$$

$$V_R = 1,838.9 \text{ ft}^3 (7.48 \text{ gal/ft}^3)$$

$$V_R = 13,754.97 \text{ gal}$$

$$V_{Total} = 38,621.44 \text{ gal} - 13,754.97 \text{ gal}$$

$$\underline{V_{Total} = 24,900 \text{ gal}}$$



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MAR 25 1999

DEPT OF ENV PROTECTION
WEST PALM BEACH

March 23, 1999

Mr. Vincent Peluso
FL DEP - Southeast District
400 N. Congress Avenue
P.O. Box 15425
West Palm Beach, FL 33416

**Re: Recalculation of Tank Farm Containment Volume
Safety-Kleen Systems, Medley, FL Service Center
Facility EPA ID # FLD984171694**

Dear Mr. Peluso:

As a follow-up to our telephone discussion on Friday, March 12, I am submitting this information for your review.

During the week of February 15, 1999, the Safety-Kleen Corporate Audit Department conducted an environmental, health & safety audit of the Safety-Kleen Medley Service Center. One of the findings from this audit concerned the tank farm containment volume calculations included with our current RCRA Permit Application.

The containment volume calculations noted in the permit application were based on the presumption that six vertical tanks and their corresponding concrete tank pads were located in the tank farm. In actuality, the Medley tank farm contains three vertical tanks (19,000 gallons permitted volume) with corresponding concrete tank pads, and one 12,000 gallon horizontal tank (disconnected and never used at the Medley facility) resting on the containment floor. In response to the Audit Department's concern of insufficient tank farm containment volume (due to the presence of the horizontal tank), Environmental Resources Management (ERM) was contracted to recalculate this containment volume using the existing tank farm conditions.

ERM has determined that the existing tank farm containment volume is appropriate. Attached is a cover letter from ERM detailing the revised Medley tank farm containment volume, and copies of the calculations. If you have any questions concerning this matter, or need additional information, please contact me at (561) 736-2267.

Sincerely,

Scott A. Schneider
Environmental, Health & Safety Manager

cc: Mr. Tim Sholl, Safety-Kleen (without attachments)
Mr. Phil Retallick, Safety-Kleen (without attachments)
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