



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

OCT 03 1990

Ms. Ellen Siegler
American Petroleum Institute
1220 L Street Northwest
Washington, D.C. 20005

MAR 27 1991

EPA AIR DOCKET

Dear Ms. Siegler:

The purpose of this letter is to respond to questions that were asked by the American Petroleum Institute (API) to clarify the technical requirements of the National Emission Standard for Benzene Waste Operations under 40 CFR 61 Subpart FF. These questions were asked during a meeting between representatives of API and the U.S. Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards (OAQPS) in Durham, North Carolina on April 26, 1990. Answers to the questions are provided below.

Total Annual Benzene Quantity Determination under §61.342(d)

For the total annual benzene quantity determination under §61.342(d)(2)(i), API suggested that we change the procedure so that annual benzene quantity for an individual treated waste stream is determined at the location where the waste stream first enters an exempt waste management unit instead of where the waste stream exits the treatment process. This change would make the procedure in §61.342(d)(2)(i) consistent with the procedure now specified in §61.348(b)(2)(ii) for determining the total annual benzene quantity managed in exempt waste management units comprising a facility wastewater treatment system.

The change suggested by API is not appropriate because §61.342(d)(2)(i) and §61.348(b)(2)(ii) serve separate and distinct purposes. We intentionally selected different methods of calculating the total annual benzene quantity values used for the two sections. Both of these sections were added to the rule after proposal.

Section 61.342(d) was added to the final rule in response to public comments that the proposed rule required control of benzene emissions beyond the level necessary for protection of public health. It was determined that certain waste streams that are greater than 10 ppmw could be exempted from the treatment and control requirements while maintaining the level of protection obtained by the rule. This would occur by limiting the total quantity of benzene in the untreated and treated wastes managed at a facility in units not using emission controls. For the purpose of exempting those waste streams having low benzene quantities from the treatment and control requirements specified in the rule, total annual benzene quantity is determined in §61.342(d) by summing the benzene

quantity in the individual waste streams transferred out of treatment units plus the benzene quantity in the individual untreated waste streams.

Section 61.348(b) was added to the final rule in response to public comments that the equation proposed by EPA to establish an alternative benzene concentration limit standard for combined waste streams was difficult to apply in many situations. To ensure that the health risk goals of Clean Air Act Section 112 are achieved for wastewater treatment units (i.e., tanks and surface impoundments) that meet the 10 ppmw benzene concentration performance standard by combining or mixing waste streams, a total annual benzene quantity limit was established. The total benzene quantity is determined by summing the benzene quantity in the individual waste streams placed into treatment units exempt from the control requirements.

Belt-Press Dewatering Unit Status

The API asked us to clarify the applicability of the standards to belt-press type dewatering units. The API expressed the concern that the cover requirements specified by the rule were not compatible with the operation of these units at petroleum refineries because the units require essentially continuous operator observation and frequent operator access to the equipment.

The standards for tanks specified by §61.343 apply to all types of dewatering units. These standards require that the owner or operator install and operate on the unit a cover connected through a closed vent system to a control device. For situations where frequent operator access to equipment is necessary for normal process operation, we interpret the rule to allow an owner or operator to comply with the requirements specified under §61.343(a)(1) by using a permanently installed enclosure with openings provided that the enclosure completely surrounds the source such that all benzene emissions from the source are captured and contained for discharge through a closed vent system to a control device. As guidance to EPA Regional and State air program offices for developing State implementation plan revisions, we have developed specific design criteria for a permanent total enclosure and a procedure for determining whether an enclosure meets the criteria (refer to Enclosure 1). Compliance with these criteria and the verification procedure are acceptable for meeting the requirements of §61.343(a)(1)(i).

Water Seal Controls for Individual Drain System Junction Boxes

The API asked us to clarify the type of water seal controls required for individual drain system junction boxes as specified by §61.346(b)(2)(ii)(A). Specifically, API stated that some of its members were interpreting this requirement to mean EPA is requiring water seal controls be installed on junction box vents.

Section 61.346 establishes control requirements for individual drain systems. The basic control requirement for individual drain systems is that they be equipped with a cover and closed vent system that routes all

organic vapors to a control device. As an alternative to complying with this requirement, an owner or operator may elect to comply with the standards in §61.346(b). For these alternative standards, a junction box may have a vent pipe provided that the junction box is equipped with a system to prevent the flow of organic vapors from the junction box vent pipe during normal operation. The rule states that one example of such a system is the "use of water seal controls." Our intention here to require that each junction box be isolated from the rest of the drain system by water seals or equivalent controls, and not that each junction box vent pipe use a water seal. A clarification to the rule was issued on September 10, 1990, (refer to 55 FR 37230) that revises §61.346(b)(2)(ii)(A) to read: "An example of such a system included use of water seal controls on the junction box."

We intend that the standards under §61.346(b) be used only for those cases when no airflow occurs through the junction box vent pipe during normal operation. For these cases, we consider normal operation to mean that wastewater level changes in the junction box do not result in air flowing through the sewer lines into the junction box and out through the vent pipe (i.e., liquid level in the junction box remains above the top of the sewer line inlets to the junction box). To monitor junction vent pipe airflow, the standards require that each junction box vent pipe be equipped with a flow indicator. This requirement means using any appropriate device that indicates whether or not there is airflow through the vent pipe.

Enhanced Biodegradation Wastewater Treatment Unit Requirements

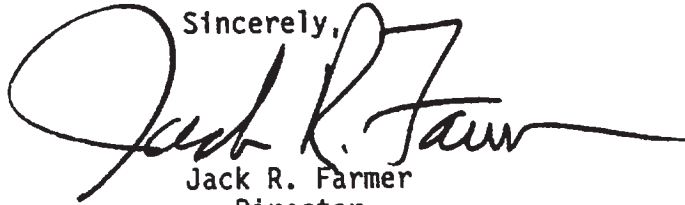
The API asked us to clarify the type of biological treatment unit considered to be enhanced biodegradation under §61.348(b)(2)(ii)(B). The API mentioned three cases that API members consider to be enhanced biodegradation but do not meet the conditions specified in the rule: (1) an activated sludge process in which the sludge is recycled from another unit, (2) an activated sludge process with a residence time exceeding 36 hours, and (3) rotating biological contractors.

We intend the exemption for enhanced biodegradation units to apply only to suspended growth biological processes that generate biomass, use recycled biomass, and periodically remove biomass from the process. The rule clarification in the September 10, 1990, Federal Register notice states this intention.

We interpret the rule with respect to the three biological treatment cases cited by API as follows. First, a suspended growth biological process using biomass recycled from a different unit is considered an enhanced biodegradation unit. Second, we acknowledge that residence times longer than 36 hours can be used for biodegradation units containing sufficient biomass. Therefore, a suspended growth biological process with a residence time exceeding 36 hours is considered an enhanced biodegradation unit, provided that the process also meets the other operating criteria cited in the rule. Finally, a biological wastewater treatment unit that uses an attached growth process (e.g., rotating biological contactors, trickling filters) is not an enhanced biodegradation unit for this rule because EPA has no data to assess the effectiveness of this type of unit in destroying benzene in the waste.

If you have any questions regarding this letter, please contact Mr. K. C. Hustvedt at (919) 541-5395 or Mr. Bob Lucas at (919) 541-0884.

Sincerely,

A handwritten signature in black ink, appearing to read "Jack R. Farmer". The signature is fluid and cursive, with a large initial "J" and a long horizontal stroke at the end.

Jack R. Farmer
Director
Emission Standards Division

Enclosure

cc: Doug Bell (EPA/OAQPS)
K. C. Hustvedt (EPA/OAQPS)
Bob Lucas (EPA/OAQPS)
Susan Wyatt (EPA/OAQPS)

ENCLOSURE 1

VOC CAPTURE EFFICIENCY Procedure T - Criteria for and Verification of a Permanent or Temporary Total Enclosure

1. INTRODUCTION

1.1 Applicability. This procedure is used to determine whether a permanent or temporary enclosure meets the criteria of a total enclosure.

1.2 Principle. An enclosure is evaluated against a set of criteria. If the criteria are met and if all the exhaust gases are ducted to a control device, then the volatile organic compounds (VOC) capture efficiency (CE) is assumed to be 100 percent and CE need not be measured. However, if part of the exhaust gas stream is not ducted to a control device, CE must be determined.

2. DEFINITIONS

2.1 Natural Draft Opening (NDO) -- Any permanent opening in the enclosure that remains open during operation of the facility and is not connected to a duct in which a fan is installed.

2.2 Permanent Total Enclosure (PTE) -- A permanently installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through a control device.

2.3 Temporary Total Enclosure (TTE) -- A temporarily installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through ducts that allow for the accurate measurement of VOC rates.

3. CRITERIA OF A TEMPORARY TOTAL ENCLOSURE

3.1 Any NDO shall be at least 4 equivalent opening diameters from each VOC emitting point.

3.2 Any exhaust point from the enclosure shall be at least 4 equivalent duct or hood diameters from each NDO.

3.3 The total area of all NDO's shall not exceed 5 percent of the surface area of the enclosure's four walls, floor, and ceiling.

3.4 The average facial velocity (FV) of air through all NDO's shall be at least 3,600 m/hr (200 fpm). The direction of air through all NDO's shall be into the enclosure.

3.5 All access doors and windows whose areas are not included in Section 3.3 and are not included in the calculation in Section 3.4 shall be closed during routine operation of the process.

4. CRITERIA OF A PERMANENT TOTAL ENCLOSURE

4.1 Same as Sections 3.1 and 3.3 - 3.5.

4.2 All VOC emissions must be captured and contained for discharge through a control device.

5. PROCEDURE

5.1 Determine the equivalent diameters of the NDO's and determine the distances from each VOC emitting point to all NDO's. Determine the equivalent diameter of each exhaust duct or hood and its distance to all NDO's. Calculate the distances in terms of equivalent diameters. The number of equivalent diameters shall be at least 4.

5.2 Measure the total area (A_e) of the enclosure and the total area (A_N) of all NDO's of the enclosure. Calculate the NDO to enclosure area ratio (NEAR) as follows:

$$NEAR = A_N/A_e$$

The NEAR must be ≤ 0.05 .

5.3 Measure the volumetric flow rate, corrected to standard conditions, of each gas stream exiting the enclosure through an exhaust duct or hood using EPA Method 2. In some cases (e.g., when the building is the enclosure), it may be necessary to measure the volumetric flow rate, corrected to standard conditions, of each gas stream entering the enclosure through a forced makeup air duct using Method 2. Calculate FV using the following equation:

$$FV = [Q_0 - Q_1] / A_N$$

where:

Q_0 = the sum of the volumetric flow from all gas streams exiting the enclosure through an exhaust duct or hood.

Q_1 = the sum of the volumetric flow from all gas streams into the enclosure through a forced makeup air duct; zero, if there is no forced makeup air into the enclosure.

A_N = total area of all NDO's in enclosure.

The FV shall be at least 3,600 m/hr (200 fpm).

5.4 Verify that the direction of air flow through all NDO's is inward. Use streamers, smoke tubes, tracer gases, etc. Strips of plastic wrapping film have been found to be effective. Monitor the direction of air flow at intervals of at least 10 minutes for at least 1 hour.

6. QUALITY ASSURANCE

6.1 The success of this protocol lies in designing the TTE to simulate the conditions that exist without the TTE, i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of fugitive VOC emissions should be minimal. The TTE must enclose the application stations, coating reservoirs, and all areas from the application station to the oven. The oven does not have to be enclosed if it is under negative pressure. The NDO's of the temporary enclosure and a fugitive exhaust fan must be properly sized and placed.

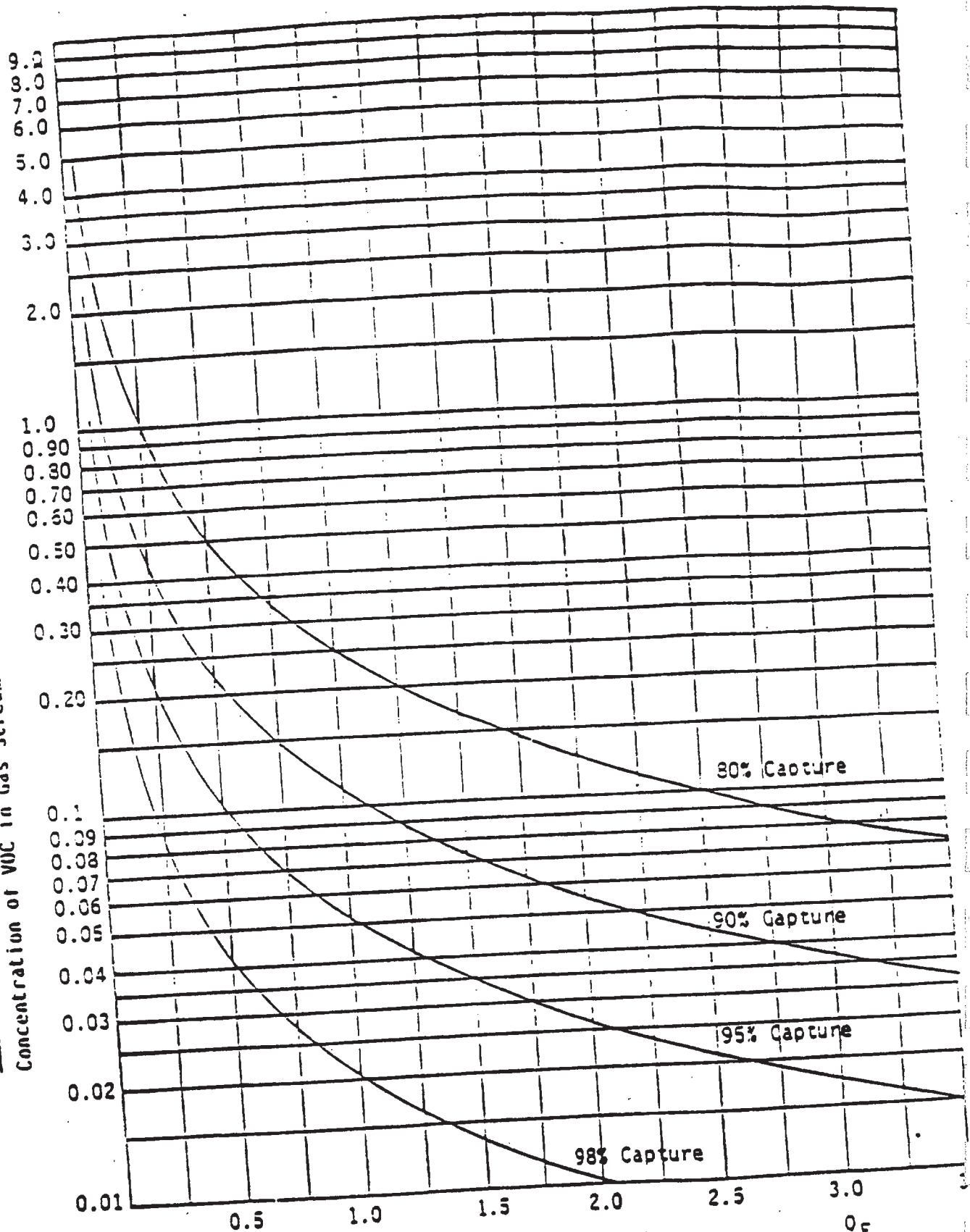
6.2. Estimate the ventilation rate of the TTE that best simulates the conditions that exist without the TTE, i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of fugitive VOC emissions should be minimal. Figure 1 may be used as an aid. Measure the concentration (C_G) and flow rate (Q_G) of the captured gas stream, specify a safe concentration (C_F) for the fugitive gas stream, estimate the CE, and then use the plot in Figure 1 to determine the volumetric flowrate of the fugitive gas stream (Q_F). A fugitive VOC emission exhaust fan that has a variable flow control is desirable.

6.2.1 Monitor the concentration of VOC into the capture device without the TTE. To minimize the effect of temporal variation on the captured emissions, the baseline measurement should be made over as long a time period as practical. However, the process conditions must be the same for the measurement in Section 6.2.3 as they are for this baseline measurement. This may require short measuring times for this quality control check before and after the construction of the TTE.

6.2.2 After the TTE is constructed, monitor the VOC concentration inside the TTE. This concentration shall not continue to increase and must not exceed the safe level according to OSHA requirements for permissible exposure limits. An increase in VOC concentration indicates poor TTE design or poor capture efficiency.

6.2.3 Monitor the concentration of VOC into the capture device with the TTE. To limit the effect of the TTE on the process, the VOC concentration with and without the TTE must be within ± 10 percent. If the measurements do not agree, adjust the ventilation rate from the TTE until they agree within 10 percent.

$\frac{C_F}{C_G}$
 Concentration of VOC in Fugitive Emission Exhaust Stream
 Concentration of VOC in Gas Stream Delivered to the Control Device



Volumetric Flowrate of Fugitive Emissions Exhaust Stream, Q_F
 Volumetric Flowrate of Gas Stream Delivered to the Control Device, Q_G