State of California
AIR RESOURCES BOARD

Resolution 80-27

June 26, 1980

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (ARB) to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Section 43830 of the Health and Safety Code directs the ARB to establish maximum standards for the volatility of gasoline at nine pounds per square inch Reid vapor pressure (RVP) as determined by the American Society for Testing and Materials (ASTM) test Method D 323-58 or by an appropriate test determined by the ARB;

WHEREAS, Section 2251 of Title 13 of the California Administrative Code, entitled Reid Vapor Pressure of Gasoline, has previously been promulgated in accordance with the provisions of the Health and Safety Code and provides that RVP be determined in accordance with ASTM Method D 323-58;

WHEREAS, paragraph 4(b) of the RVP test method, ASTM Method D 323-58, states that sampling shall be done in accordance with ASTM Method D 270, entitled Standard Method of Sampling Petroleum and Petroleum Products;

WHEREAS, ASTM Method D 270 provides specific sampling procedures for obtaining gasoline samples under certain circumstances but, paragraph 7.1 of this method states that directions for sampling cannot be made explicit enough to cover all cases;

WHEREAS, the staff of the ARB determined that enforcement of Section 43830 of the Health and Safety Code requires taking gasoline samples at the point of sale or supply to motor vehicles and therefore employed a form of tap or continuous sampling during its inspection program during August 1977;

WHEREAS, sales of gasoline with a RVP greater than nine pounds per square inch were documented in August 1977 and complaints were filed against oil companies found to be selling such gasoline; and a lawsuit filed against Mobil Oil Corporation was brought to trial and heard in the Los Angeles Superior Court by Judge Max Wisot and the court's decision stated that the staff of the ARB did not strictly follow ASTM Method D 270 since in the court's opinion the bottle sampling method should have been utilized;

WHEREAS, the bottle sampling method specified in ASTM D 270 is infeasible as an enforcement tool to sample gasoline in underground storage tanks at service stations;

WHEREAS, the ARB has determined that as a result of the potential confusion stemming from the litigation arising from the August 1977 inspection, a specific regulation on obtaining gasoline samples from service station pump nozzles would provide useful clarification of the applicable test procedures;

WHEREAS, Section 43830 of the Health and Safety Code directs that the ARB has the option to establish an appropriate test method to determine the volatility of the gasoline sold in this state;

WHEREAS, the Board finds that Section 2251 as amended and Section 2261 of Title 17, California Administrative Code, are an appropriate test to determine the Reid vapor pressure of gasoline sold in this state; and

WHEREAS, notice of a public hearing to consider the proposed amendments to the RVP of Gasoline regulation and the proposed adoption of a gasoline sampling procedure for the purpose of vapor pressure testing has been given and a public hearing held in accordance with the provisions of the Health and Safety Code and the Administrative Procedure Act (Government Code Section 11371 et seq);

WHEREAS, it is necessary that the changes to regulations contained in Title 13, California Administrative Code, become effective as soon as possible after their adoption so that they will apply to the Board's enforcement of regulatory and statutory provisions governing the volatility of gasoline in the summer months of this year when air pollution problems are at their worst;

NOW, THEREFORE, BE IT RESOLVED that the Board amends Section 2251 and adopts Section 2261 of Subchapter 5, Chapter 3, Title 13, California Administrative Code, as set forth in the attachment hereto, as the test to determine the Reid vapor pressure of gasoline sold in this state;

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to file with the Secretary of State the regulations adopted herein to become effective as soon as possible;

BE IT FURTHER RESOLVED that the ARB delegates to the Executive Officer of the ARB the authority to make further changes to the vapor pressure test and/or sampling methods for gasoline sold in this state based on suitable scientific and/or technical evidence; and

BE IT FURTHER RESOLVED that notwithstanding the amendments to Section 2251 and the addition of Section 2261, Title 17, California Administrative Code, adopted June 26, 1980, the provisions of Section 2251 as they existed prior to the effective date of these amendments shall continue to be operative and effective with respect to the sale or supply of fuel for motor vehicles prior to the effective date of said amendments.

I certify that the above is a true
and correct copy of Resolution 80-27
as adopted by the Air Resources Board.

Sally Rump

Sally Rump
Board Secretary

FOR FILING ADMINISTRATIVE REGULATIONS
WITH THE SECRETARY OF STATE
(Pursuant to Government Code Section 11380.1)

Copy below is hereby certified to be a true and correct copy of regulations adopted, or amended, or an order of repeal by:

Air Resources Board
(Agency)

Date of adoption, amendment, or repeal:

June 26, 1980

By: [signature]

Executive Officer
(Title)

DO NOT WRITE IN THIS SPACE | DO NOT WRITE IN THIS SPACE

The attached regulations which are being adopted, amended or repealed are contained in Title 13 of the California Administrative Code.

(Optional): Division, Part, Chapter, etc., affected by this order: ______

(Check as applicable:)
TYPE OF ORDER:

- X Emergency
- X Certificate of Compliance
- ___ Certificate of Non-Compliance
- ___ Regular
- ___ Procedural and Organizational

(Check One:)
EFFECTIVE DATE:

- X On filing with Secretary of State
- ___ On ______ (designated effective date)
- ___ On ______ as specified by Statutes ______
- ___ On 30th day after filing

(Check all:)
CHECKLIST OF MANDATORY REQUIREMENTS

- X Eight copies of order or Certificate attached.
- X Original signature on at least one copy.
- X Regulation Summary (Form 550 or equivalent) attached (1 copy).
- X Publication date (in Notice Register) of notice for attached order or Certificate of Compliance is 5/7/80.
- X Authority and reference citation placed beneath each section in attached order.

(Check one:)
REIMBURSABLE COSTS:

- X These are "no cost" regulations under Revenue and Taxation Code Section 2231, and State Administrative Manual Section 6052.1.
- ___ These are "disclaimable cost" regulations under Revenue and Taxation Code Section 2231. A clarifying disclaimer statement is attached, pursuant to State Administrative Manual Section 6052.2.
- ___ These are "cost" regulations under Revenue and Taxation Code Section 2231. This agency has followed the provisions of State Administrative Manual Section 6052.3.

(Check one:)
COSTS/SAVINGS TO LOCAL, STATE AND FEDERAL GOVERNMENT

- X These regulations involve no costs or savings to local, state or federal government under Government Code Section 11421.
- ___ These regulations do involve costs or savings to local, state or federal government under Government Code Section 11421. An estimate of these costs or savings is attached to this order.

(Check one:)
BUILDING STANDARDS

- X These regulations contain no building standards under Health and Safety Code Sections 18900-18915.
- ___ These regulations do contain building standards under Health and Safety Code Sections 18900-18915. The date of approval by the Building Standards Commission is ______

(Check one if attached are Conflict of Interest Regulations)
CONFLICT OF INTEREST

The attached Conflict of Interest Regulations contain the FPPC approval stamp and:

- ___ Are to be published in full in the Administrative Code.
- ___ Are to be codified by appropriate reference in the Administrative Code, and include a statement as to where the full text may be obtained.

(Check if emergency Campaign Disclosure Regulations)
CAMPAIGN DISCLOSURE

- ___ These are emergency regulations pertaining to campaign disclosure law and were adopted by unanimous vote of all board or commission members present at the regulation adoption proceeding.

COMPLETE REVERSE SIDE IF THESE ARE EMERGENCY REGULATIONS

DO NOT WRITE IN THIS SPACE

orders are necessary for the immediate preservation of the public peace, health and safety or general welfare. The specific facts constituting the need for immediate action are: (attach continuation sheet, if necessary)

(check if applicable:)

___ These emergency regulations a readoption of a previous emergency order which has not yet been certi or it is substantially equivalent previous emergency order which has yet been certified. Approval th Governor was obtained on:

It is necessary that the changes to regulations contained in Title 13, California Administrative Code, become effective as soon as possible after their adoption so that they will apply to the Board's enforcement of regulatory and statutory provisions governing the volatility of gasoline in the summer months of this year when air pollution problems are at their worst.

The blanket citation of authority and reference for this emergency action is:
Authority: Sections 39600, 39601, Health and Safety Code
Reference: Section 43830, Health and Safety Code

The name and phone number of the agency official to whom inquiries about the emergency order may be directed are:

NAME James J. Morgester Phone (916) 322-6022

(Complete one:)

X These regulations involve no costs or savings to local, state or federal government under Government Code Section 11421.

___ These regulations do involve costs or savings to local, state or federal government under Government Code Section 11421. An estimate of those costs or savings is attached to this order.

(Complete one:)

X To fulfill Government Code S 11421, attached is an inform digest, providing a clear an concise summary of existing and regulations, if any, rel directly to the proposed act and the effect of the pr s action.

___ To fulfill Government Code S tion 11421, express terms of emergency are attached.

Repeal Subchapter 5, Section 2251 in Title 13, California Administrative Code.

NOTE: Authority cited: §§ 39600 and 39601 Health and Safety Code. Reference: § 43830 Health and Safety Code.

Adopt Subchapter 5, Article 1, Section 2251 and Article 2, Section 2261 in Title 13, California Administrative Code.

Subchapter 5. Standards for Motor Vehicle Fuels

Article 1. Standards

2251. Reid Vapor Pressure for Gasoline. No person shall sell or supply as a fuel for motor vehicles as defined by the Vehicle Code of the State of California a gasoline having a Reid vapor pressure greater than nine pounds per square inch as sampled pursuant to Section 2261 and tested by ASTM Method D 323-58, deleting paragraph 4(b) concerning sampling, beginning in 1971 in the following air basins established by the State Air Resources Board.

(a) April 1 through October 31:

South Coast Air Basin (as defined on January 1, 1976).

Southeast Desert Air Basin

(b) May 1 through September 30:

Great Basin Valley Air Basin

(c) May 1 through October 31:

San Francisco Bay Area Air Basin

San Diego Air Basin

Sacramento Valley Air Basin

San Joaquin Valley Air Basin

Mountain Counties Air Basin

Lake Tahoe Air Basin

(d) June 1 through September 30:

North Coast Air Basin

Lake County Air Basin

(e) June 1 through October 31:

North Central Coast Air Basin

South Central Coast Air Basin (as defined on January 1, 1976).

This section shall not be applicable to gasoline delivered to retail outlets more than 14 days immediately preceding the periods set forth for each basin herein. Notwithstanding the amendments to this section adopted June 26, 1980, the provisions of this section as they existed prior to the effective date of these amendments shall continue to be operative and effective with respect to the sale or supply of fuel for motor vehicles prior to the effective date of said amendments.

NOTE: Authority cited: §§ 39600 and 39601 Health and Safety Code. Reference: § 43830 Health and Safety Code.

Adopt Section 2261 in Title 13, California Administrative Code.

Article 2. Sampling and Testing Procedures

2261. Gasoline Sampling Procedures for Reid Vapor Pressure. (a) "Scope." This method covers procedures for obtaining representative samples of gasoline for motor vehicles pursuant to Section 2251 for the purpose of testing for Reid vapor pressure (RVP).

(b) "Summary of method." It is necessary that the samples be truly representative of the gasoline in question. The precautions required to ensure the representative character of the samples are numerous and depend upon the tank, carrier, container or line from which the sample is being obtained, the type and cleanliness of the sample container, and the sampling procedure that is to be used. A summary of the sampling procedures and their application is presented in Table 1. Each procedure is suitable for sampling a material under definite storage, transportation, or container conditions. The basic principle of each procedure is to obtain a sample in such manner and from such locations in the tank or other container that the sample will be truly representative of the gasoline.

(c) "Description of terms."

(1) "Average sample" is one that consists of proportionate parts from all sections of the container.

(2) "All-levels sample" is one obtained by submerging a stoppered beaker or bottle to a point as near as possible to the draw-off level, then opening the sampler and raising it at a rate such that it is about 3/4 full (maximum 85 percent) as it emerges from the liquid. An all-levels sample is not necessarily an average sample because the tank volume may not be proportional to the depth and because the operator may not be able to raise the sampler at the variable rate required for proportionate filling. The rate of filling is proportional to the square root of the depth of immersion.

(3) "Running sample" is one obtained by lowering an unstoppered beaker or bottle from the top of the gasoline to the level of the bottom of the outlet connection or swing line, and returning it to the top of the gasoline at a uniform rate of speed such that the beaker or bottle is about 3/4 full when withdrawn from the gasoline.

(4) "Spot sample" is one obtained at some specific location in the tank by means of a thief bottle, or beaker.

(5) "Top sample" is a spot sample obtained 6 inches (150 mm) below the top surface of the liquid (Figure 1).

(6) "Upper sample" is a spot sample taken at the mid-point of the upper third of the tank contents (Figure 1).

(7) "Middle sample" is a spot sample obtained from the middle of the tank contents (Figure 1).

(8) "Lower sample" is a spot sample obtained at the level of the fixed tank outlet or the swing line outlet (Figure 1).

(9) "Clearance sample" is a spot sample taken 4 inches (100 mm) below the level of the tank outlet (Figure 1).

(10) "Bottom sample" is one obtained from the material on the bottom surface of the tank, container, or line at its lowest point.

(11) "Drain sample" is one obtained from the draw-off or discharge valve. Occasionally, a drain sample may be the same as a bottom sample, as in the case of a tank car.

(12) "Continuous sample" is one obtained from a pipeline in such manner as to give a representative average of a moving stream.

(13) "Mixed sample" is one obtained after mixing or vigorously stirring the contents of the original container, and then pouring out or drawing off the quantity desired.

(14) "Nozzle sample" is one obtained from a gasoline service station pump nozzle which dispenses gasoline from an underground storage tank.

(d) "Sample containers."

(1) Sample containers may be clear or brown glass bottles, or cans. The clear glass bottle is advantageous because it may be examined visually for cleanliness, and also allows visual inspection of the sample for free water or solid impurities. The brown glass bottle affords some protection from light. The only cans permissible are those with the seams soldered on the exterior surface with a flux of rosin in a suitable solvent. Such a flux is easily removed with gasoline, whereas many others are very difficult to remove.

(2) "Container closure." Cork or glass stoppers, or screw caps of plastic or metal, may be used for glass bottles; screw caps only shall be used for cans to provide a vapor-tight closure seal. Corks must be of good quality, clean and free from holes and loose bits of cork. Never use rubber stoppers. Contact of the sample with the cork may be prevented by wrapping tin or aluminum foil around the cork before forcing it into the bottle. Glass stoppers must be a perfect fit. Screw caps must be protected by a cork disk faced with tin or aluminum foil, or other material that will not affect petroleum or petroleum products.

(3) "Cleaning procedure." All sample containers must be absolutely clean and free of water, dirt, lint, washing compounds, naphtha, or other solvents, soldering fluxes or acids, corrosion, rust, and oil. Before using

a container, rinse it with Stoddard solvent or other naphtha of similar volatility. (It may be necessary to use sludge solvents to remove all traces of sediment and sludge from containers previously used.) Then wash the container with strong soap solution, rinse it thorougly with tap water, and finally with distilled water. Dry either by passing a current of clean, warm air through the container or by placing it in a hot dust-free cabinet at 104 degrees Fahrenheit (40 degrees centigrade) or higher. When dry, stopper or cap the container immediately.

(e) "Sampling apparatus" is described in detail under each of the specific sampling procedures. Clean, dry, and free all sampling apparatus from any substance that might contaminate the material, using the procedure described in (d)(3).

(f) "Time and place of sampling." When loading or discharging gasoline, take samples from both shipping and receiving tanks, and from the pipeline if required.

(1) "Ship or barge tanks." Sample each product after the vessel is loaded or just before unloading.

(2) "Tank cars." Sample the product after the car is loaded or just before unloading.

NOTE: When taking samples from tanks suspected of containing flammable atmospheres, precautions should be taken to guard against ignitions due to static electricity. Metal or conductive objects, such as gage

tapes, sample containers, and thermometers, should not be lowered into or suspended in a compartment or tank which is being filled or immediately after cessation of pumping. A waiting period of approximately one minute will generally permit a substantial relaxation of the electrostatic charge; under certain conditions a longer period may be deemed advisible.

(g) "Obtaining samples."

(1) Directions for sampling cannot be made explicit enough to cover all cases. Extreme care and good judgment are necessary to ensure samples that represent the general character and average condition of the material. Clean hands are important. Clean gloves may be worn but only when absolutely necessary, such as in cold weather, or when handling materials at high temperature, or for reasons of safety. Select wiping cloths so that lint is not introduced, contaminating samples.

(2) As many petroleum vapors are toxic and flammable, avoid breathing them or igniting them from an open flame or a spark produced by static.

(3) When sampling relatively volatile products (more than 2 pounds (0.14 kgf/cm^2) RVP), the sampling apparatus shall be filled and allowed to drain before drawing the sample. If the sample is to be transferred to another container, this container shall also be rinsed with some of the volatile product and then drained. When the actual sample is emptied into this container, the sampling apparatus should be upended

into the opening of the sample container and remain in this position until the contents have been transferred so that no unsaturated air will be entrained in the transfer of the sample.

(h) "Handling samples."

(1) "Volatile samples." It is necessary to protect all volatile samples of gasoline from evaporation. Transfer the product from the sampling apparatus to the sample container immediately. Keep the container closed except when the material is being transferred. When samples of more than 16 pounds (1.12 kgf/cm^2) RVP are being obtained, be sure to use containers strong enough to meet local safety regulations. After delivery to the laboratory, volatile samples should be cooled before the container is opened.

(2) "Container outage." Never completely fill a sample container, but allow adequate room for expansion, taking into consideration the temperature of the liquid at the time of filling and the probable maximum temperature to which the filled container may be subjected.

(i) "Shipping samples." To prevent loss of liquid and vapors during shipment, and to protect against moisture and dust, cover the stoppers of glass bottles with plastic caps that have been swelled in water, wiped dry, placed over the tops of the stoppered bottles, and allowed to shrink tightly in place. The

caps of metal containers must be screwed down tightly and checked for leakage. Postal and express office regulations applying to the shipment of flammable liquids must be observed.

(j) "Labeling sample containers."

(1) Label the container immediately after a sample is obtained. Use waterproof and oilproof ink or a pencil hard enough to dent the tag, since soft pencil and ordinary ink markings are subject to obliteration from moisture, oil smearing, and handling. Include the following information:

(A) Date and time (the period elapsed during continuous sampling),

(B) Name of the sample,

(C) Name or number and owner of the vessel, car, or container,

(D) Brand and grade of material, and

(E) Reference symbol or identification number.

(k) "Sampling procedures." The standard sampling procedures described in this method are summarized in Table 1. Alternative sampling procedures may be used if a mutually satisfactory agreement has been reached by the parties involved and such agreement was put in writing and signed by authorized officials.

(1) "Bottle or beaker sampling." The bottle or beaker sampling procedure is applicable for sampling

liquids of 16 pounds (1.12 kgf/cm^2) RVP or less in tank cars, tank trucks, shore tanks, ship tanks, and barge tanks.

(A) "Apparatus." A suitable sampling bottle or beaker as shown in Figure 2 is required. Recommended diameter of opening in the bottle or beaker is 3/4 inch (19 mm).

(B) "Procedure."

1. "All-levels sample." Lower the weighted, stoppered bottle or beaker as near as possible to the draw-off level, pull out the stopper with a sharp jerk of the cord or chain and raise the bottle at a uniform rate so that it is about 3/4 full as it emerges from the liquid.

2. "Running sample." Lower the unstoppered bottle or beaker as near as possible to the level of the bottom of the outlet connection or swing line and then raise the bottle or beaker to the top of the gasoline at a uniform rate of speed such that it is about 3/4 full when withdrawn from the gasoline.

3. "Upper, middle, and lower samples." Lower the weighted, stoppered bottle to the proper depths (Figure 1) as follows:

Upper sample	middle of upper third of the tank contents
Middle sample	middle of the tank contents
Lower sample	level of the fixed tank outlet or the swing-line outlet

Pull out the stopper with a sharp jerk of the cord or chain and allow the bottle or beaker to fill completely at the selected level, as evidenced by the cessation of air bubbles. When full, raise the bottle or beaker, pour off a small amount, and stopper immediately.

4. "Top sample." Obtain this sample (Figure 1) in the same manner as specified in (j)(1)(B)3. but at 6 inches (150 mm) below the top surface of the tank contents.

5. "Handling." Stopper and label bottle samples immediately after taking them, and deliver to the laboratory in the original sampling bottles.

(2) "Tap sampling." The tap sampling procedure is applicable for sampling liquids of 26 pounds (1.83 kgf/cm^2) RVP or less in tanks which are equipped with suitable sampling taps or lines. This procedure is recommended for volatile stocks in tanks of the breather and balloon roof type, spheroids, etc. (Samples may be taken from the drain cocks of gage glasses, if the tank is not equipped with sampling taps.) The assembly for tap sampling is shown in Figure 3.

(A) "Apparatus."

1. "Tank taps." The tank should be equipped with at least three sampling taps placed equidistant throughout the tank height and extending at least three feet (one m) inside the tank shell. A standard 1/4 inch pipe with suitable valve is satisfactory.

2. "Tube." A delivery tube that will not contaminate the product being sampled and long enough to reach to the bottom of the sample container is required to allow submerged filling. When a cooling bath is used while tap sampling, a similar suitable tube should be used between the tank tap and the cooler inlet.

3. "Sample containers." Use clean, dry glass bottles of convenient size and strength to receive the samples. In some cases, metal containers may be used instead of glass bottles.

(B) "Procedure."

1. Before a sample is drawn, flush the tap (or gage glass drain cock) and line until they are purged completely. Connect the clean delivery tube to the tap. Draw upper, middle, or lower samples directly from the respective taps after the flushing operation. Stopper and label the sample container immediately after filling, and deliver it to the laboratory.

2. When a sample cooler is used during the tap sampling operation, flush the tap (or gage glass drain cock). Then, using a section of clean tubing, connect the tap to the cooler inlet. Flush the cooler thoroughly, after which connect the clean delivery tube to the cooler outlet and proceed with the sampling operation.

(3) "Continuous sampling." The continuous sampling procedure is applicable for sampling liquids of 16 pounds (1.12 kgf/cm^2) RVP or less and semiliquids in pipelines, filling lines, and transfer lines. The continuous sampling may be done manually or by using automatic devices.

(A) "Apparatus."

1. "Sampling probe." The function of the sampling probe is to withdraw from the flow stream a portion that will be representative of the entire stream. The apparatus assembly for continuous sampling is shown in Figure 4. Probe designs that are commonly used are as follows:

a. A tube extending to the center of the line and beveled at a 45 degree angle facing upstream (Figure 4(a)).

b. A long-radius forged elbow or pipe bend extending to the center line of the pipe and facing upstream. The end of the probe should be reamed to give a sharp entrance edge (Figure 4(b)).

c. A closed-end tube with a round orifice spaced near the closed end which should be positioned in such a way that the orifice is in the center of the pipeline and is facing the stream as shown in Figure 4(c).

2. Since the fluid pumped may not in all cases be homogeneous, the position and size of

the sampling probe should be such as to minimize stratification or dropping out of heavier particles within the tube or the displacement of the product within the tube as a result of variation in gravity of the flowing stream. The sampling probe should be located preferably in a vertical run of pipe and as near as practicable to the point where the product passes to the receiver. The probe should always be in a horizontal position.

a. The sampling lines should be as short as practicable and should be cleared before any samples are taken.

b. A suitable device for mixing the fluid flow to ensure a homogeneous mixture at all rates of flow and to eliminate stratification should be installed upstream of the sampling tap. Some effective devices for obtaining a homogeneous mixture are as follows: Reduction in pipe size; a series of baffles; orifice or perforated plate; and a combination of any of these methods.

c. The design or sizing of these devices is optional with the user, as long as the flow past the sampling point is homogeneous and stratification is eliminated.

3. To control the rate at which the sample is withdrawn, the probe or probes should be fitted with valves or plug cocks.

4. "Automatic sampling devices" that meet the standards set out in (3)(A)5. may be used in obtaining samples of gasoline. The quantity of sample collected must be of sufficient size for analysis, and its composition should be identical with the composition of the batch flowing in the line while the sample is being taken. An automatic sampler installation necessarily includes not only the automatic sampling device that extracts the samples from the line, but also a suitable probe, connecting lines, auxiliary equipment, and a container in which the sample is collected. Automatic samplers may be classified as follows:

a. "Continuous sampler, time cycle (nonproportional) types." A sampler designed and operated in such a manner that it transfers equal increments of liquid from the pipeline to the sample container at a uniform rate of one or more increments per minute is a continuous sampler.

b. "Continuous sampler, flow-responsive (proportional) type." A sampler that is designed and operated in such a manner that it will automatically adjust the quantity of sample in proportion to the rate of flow is a flow-responsive (proportional) sampler. Adjustment of the quantity of sample may be made either by varying the frequency of transferring equal increments of sample to the sample container, or by varying the volume of the increments while maintaining

a constant frequency of transferring the increments to the sample container. The apparatus assembly for continuous sampling is shown in Figure 4.

c. "Intermittent sampler." A sampler that is designed and operated in such a manner that it transfers equal increments of liquid from a pipeline to the sample container at a uniform rate of less than one increment per minute is an intermittent sampler.

5. "Standards of installation." Automatic sampler installations should meet all safety requirements in the plant or area where used, and should comply with American National Standard Code for Pressure Piping, and other applicable codes (ANSI B31.1). The sampler should be so installed as to provide ample access space for inspection and maintenance.

a. Small lines connecting various elements of the installation should be so arranged that complete purging of the automatic sampler and of all lines can be accomplished effectively. All fluid remaining in the sampler and the lines from the preceding sampling cycle should be purged immediately before the start of any given sampling operation.

b. In those cases where the sampler design is such that complete purging of the sampling lines and the sampler is not possible, a small pump should be installed in order to circulate a continuous

stream from the sampling tube past or through the sampler and back into the line. The automatic sampler should then withdraw the sample from the sidestream through the shortest possible connection.

c. Under certain conditions, there may be a tendency for water and heavy particles to drop out in the discharge line from the sampling device and appear in the sample container during some subsequent sampling period. To circumvent this possibility, the discharge pipe from the sampling device should be free of pockets or enlarged pipe areas, and preferably should be pitched downward to the sample container.

d. To ensure clean, free-flowing lines, piping should be designed for periodic cleaning.

6. "Field calibration." Composite samples obtained from the automatic sampler installation should be verified for quantity performance in a manner that meets with the approval of all parties concerned, at least once a month and more often if conditions warrant. In the case of time-cycle samplers, deviations in quantity of the sample taken should not exceed ± five percent for any given setting. In the case of flow-responsive samplers, the deviation in quantity of sample taken per 1,000 barrels of flowing stream should not exceed ± 5 percent. For the purpose of field-calibrating an installation, the composite sample

obtained from the automatic sampler under test should be verified for quality by comparing on the basis of physical and chemical properties, with either a properly secured continuous nonautomatic sample or tank sample. The tank sample should be taken under the following conditions:

a. The batch pumped during the test interval should be diverted into a clean tank and a sample taken within one hour after cessation of pumping.

b. If the sampling of the delivery tank is to be delayed beyond one hour, then the tank selected must be equipped with an adequate mixing means. For valid comparison, the sampling of the delivery tank must be completed within eight hours after cessation of pumping, even though the tank is equipped with a motor-driven mixer.

c. When making a normal full-tank delivery from a tank, a properly secured sample may be used to check the results of the sampler if the parties mutually agree to this procedure.

7. "Receiver." The receiver must be a clean, dry container of convenient size to receive the sample. All connections from the sample probe to the sample container must be free of leaks. Two types of container may be used, depending upon service requirements.

a. "Atmospheric container." The atmospheric container shall be constructed in such a way that it retards evaporation loss and protects the sample from extraneous material such as rain, snow, dust, and trash. The construction should allow cleaning, interior inspection, and complete mixing of the sample prior to removal. The container should be provided with a suitable vent.

b. "Closed container." The closed container shall be constructed in such a manner that it prevents evaporation loss. The construction must allow cleaning, interior inspection and complete mixing of the sample prior to removal. The container should be equipped with a pressure-relief valve.

(B) "Procedure."

1. "Nonautomatic sample."

a. Adjust the valve or plug cock from the sampling probe so that a steady stream is drawn from the probe. Whenever possible, the rate of sample withdrawal should be such that the velocity of liquid flowing through the probe is approximately equal to the average linear velocity of the stream flowing through the pipeline. Measure and record the rate of sample withdrawal as gallons per hour. Divert the sample stream to the sampling container continuously or intermittently to provide a quantity of sample that will be of sufficient size for analysis.

2. "Automatic sampling." Purge the sampler and the sampling lines immediately before the start of a sampling operation. If the sample design is such that complete purging is not possible, circulate a continuous stream from the probe past or through the sampler and back into the line. Withdraw the sample from the side stream through the automatic sampler using the shortest possible connections. Adjust the sampler to deliver not less than 1 and not more than 40 gallons (151 liters) of sample during the desired sampling period. For time-cycle samplers, record the rate at which sample increments were taken per minute. For flow-responsive samplers, record the proportion of sample to total stream. Label the samples and deliver them to the laboratory in the containers in which they were collected.

(4) "Nozzle sampling." The nozzle sampling procedure is applicable for sampling gasoline from a service station underground storage tank.

(A) "Apparatus." Sample containers conforming with (d)(1) should be used. A spacer, if appropriate, and nozzle extension as shown in Figures 6 and 7 shall be used when nozzle sampling.

(B) "Procedure." Immediately after gasoline has been delivered from pump and pump has been reset, deliver a small amount of product into the sample container, using spacer (Figure 6), if needed,

on the pump nozzle (vapor recovery type). Rinse sample container and dump product into waste container. Insert nozzle extension (Figure 7) into sample container and insert pump nozzle into extension with slot over air bleed hole. Replace sample container in chilling medium and fill slowly through nozzle extension to 70-80 percent full (Figure 8). Remove nozzle extension. Cap container at once. Check for leaks. Discard container and resample if leak occurs. If container is leak tight, place container in a cold chest of ice water.

(l) "Special precautions and instructions."

(1) "Precautions." Vapor pressures are extremely sensitive to evaporation losses and to slight changes in composition. When obtaining, storing, or handling samples, observe the necessary precautions to ensure samples representative of the product and satisfactory for RVP tests. Official samples should be taken by, or under the immediate supervision of a person of judgment, skill, and sampling experience. Never prepare composite samples for this test. Make certain that containers which are to be shipped by common carrier conform to Interstate Commerce Commission, state, or local regulations. When flushing or purging lines or containers, observe the pertinent regulations and precautions against fire, explosion, and other hazards.

(2) "Cooling bath." A bath (Figure 5) of sufficient size to hold the sample container and a

cooling coil of about 25 feet (8 m) of copper tubing (3/8 inch (9 mm) or less outside diameter) shall be required when using the procedure described in (1)(7). One end of the coil is provided with a connection for attaching it to the tank sampling tap or valve. The other end is fitted with a suitable valve (outlet) of good quality. A removable copper tube of 3/8 inch or less outside diameter and of sufficient length to reach the bottom of the sample container shall be connected to the open end of the outlet valve.

(3) "Sample containers." Use containers of not less than 1 quart (1 liter) nor more than 2 gallons (7.5 liter) capacity, of sufficient strength to withstand the pressures to which they may be subjected, and of a type that will permit replacement of the cap or stopper with suitable connections for transferring the sample to the gasoline chamber of the vapor pressure apparatus. Open-type containers have a single opening which permits sampling by immersion. Closed-type containers have two openings, one in each end (or the equivalent thereof), fitted with valves suitable for sampling by water displacement or by purging.

(4) "Transfer connections." The transfer connection for the open-type container consists of an air tube and a liquid delivery tube assembled in a cap or stopper. The air tube extends to the bottom of the container. One end of the liquid delivery tube is flush with the inside face of the cap or stopper and the tube

is long enough to reach the bottom of the gasoline chamber while the sample is being transferred to the chamber. The transfer connection for the closed-type container consists of a single tube with a connection suitable for attaching it to one of the openings of the sample container. The tube is long enough to reach the bottom of the gasoline chamber while the sample is being transferred.

(5) "Sampling open tanks." Use clean containers of the open type when sampling open tanks and tank cars. An all-level sample obtained by the bottle procedure, (k)(1) is recommended. Before taking the sample, flush the container by immersing it in the product to be sampled. Then obtain the sample immediately. Pour off enough so that the container will be 70-80 percent full and close it promptly. Label the container and deliver it to the laboratory.

(6) "Sampling closed tanks." Containers of either the open or closed type may be used to obtain samples from closed or pressure tanks. If the open type is used, follow the cooling bath procedure described in (1)(7) or (1)(10). If the closed type is used, obtain the sample using the water displacement procedure, (1)(8), or the purging procedure, (1)(9). The water displacement procedure is preferable because the flow of product involved in the purging procedure may be hazardous.

(7) "Cooling bath procedure." When using a container of the open type, keep it at a temperature of 32 degrees to 40 degrees Fahrenheit (0 degrees to 4.5 degrees centigrade) during the sampling operation by using the cooling bath (Figure 5). Connect the coil to the tank sampling tap or valve and flush it with a sufficient amount of product to ensure complete purging. When obtaining a sample, throttle the outlet valve so that the pressure in the coil will be approximately the same as that in the tank. Fill the container once to wash and cool it, and discard the wash product. Then draw the sample immediately. Pour off enough so that the container will be 70-80 percent full and close it promptly. Label the container and deliver it to the laboratory.

(8) "Water displacement procedure." Completely fill the closed-type container with water and close the valves. The water should be at the same temperature or lower than that of the product to be sampled. While permitting a small amount of product to flow through the fittings, connect the top or inlet valve of the container to the tank sampling tap or valve. Then open all valves on the inlet side of the container. Open the bottom or outlet valve slightly to allow the water to be displaced slowly by the sample entering the container. Regulate the flow so that there is no appreciable change in pressure within the container. Close the outlet valve

as soon as gasoline discharges from the outlet; then in succession close the inlet valve and the sampling valve on the tank. Disconnect the container and withdraw enough of the contents so that it will be 70-80 percent full. If the vapor pressure of the product is not high enough to force liquid from the container, open both the upper and lower valves slightly to remove the excess. Promptly seal and label the container, and deliver it to the laboratory.

(9) "Purging procedure." Connect the inlet valve of the closed-type container to the tank sampling tap or valve. Throttle the outlet valve of the container so that the pressure in it will be approximately equal to that in the container being sampled. Allow a volume of product equal to at least twice that of the container to flow through the sampling system. Then close all valves, the outlet valve first, the inlet valve of the container second, and the tank sampling valve last, and disconnect the container immediately. Withdraw enough of the contents so that the sample container will be 70-80 percent full. If the vapor pressure of the product is not high enough to force liquid from the container, open both the upper and lower valves slightly to remove the excess. Promptly seal and label the container and deliver it to the laboratory.

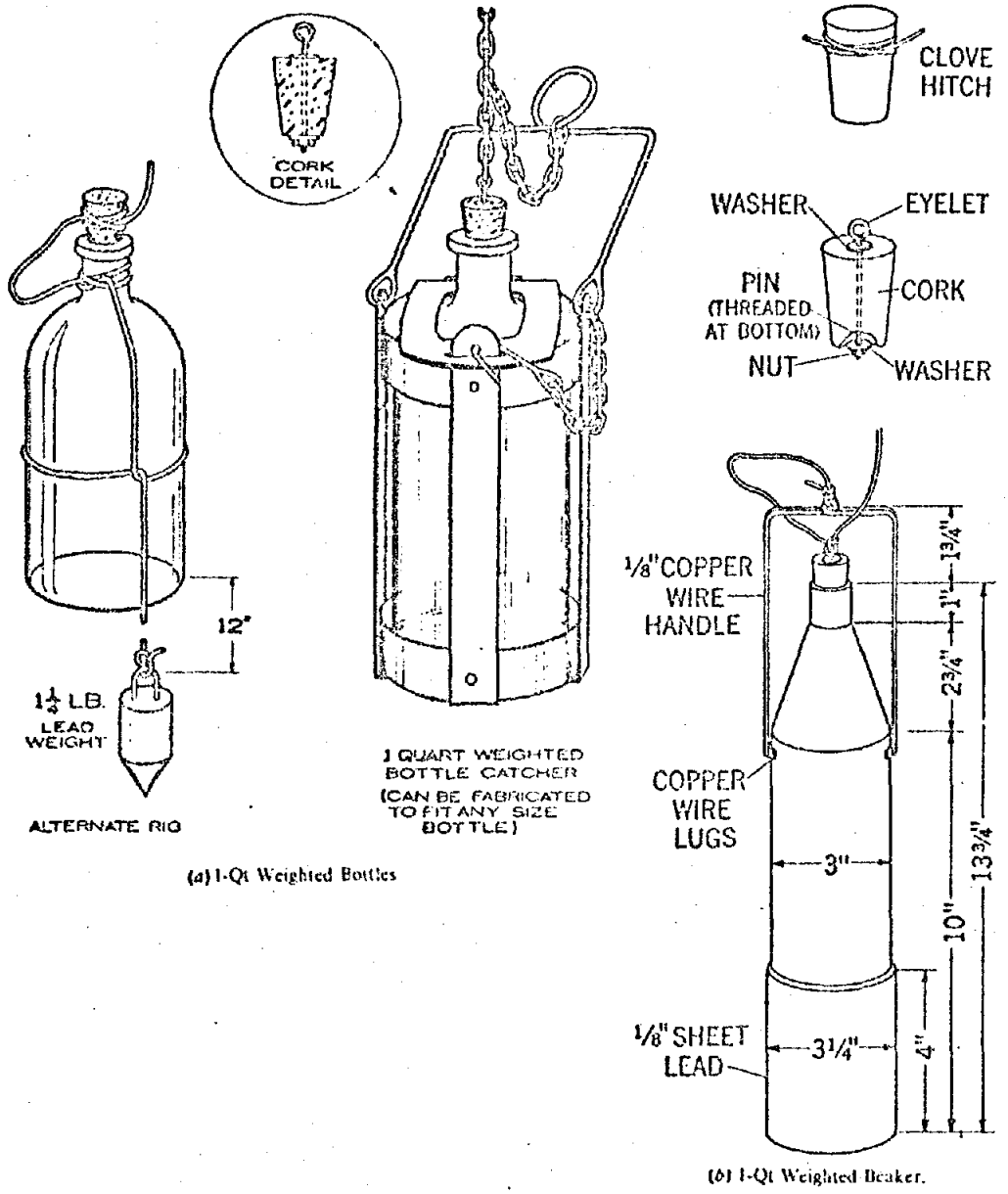
(10) "Nozzle sampling procedure." When using a container of the open type, keep it at a temperature

of 32 degrees to 40 degrees Fahrenheit (0 degree to 4.5 degrees centigrade) when sampling by the nozzle sampling procedure. The container may be chilled by placing it into an ice chest containing ice (frozen water). The sampling is accomplished following the procedure in (k)(4).

Table 1

Summary of gasoline sampling procedures and applicability.

Type of container	Procedure	Paragraph
Storage tanks, ship and barge tanks, tank cars, tank trucks	Bottle sampling	(k)(1)
Storage tanks with taps	Tap sampling	(k)(2)
Pipes and lines	Continuous line sampling	(k)(3)
Service station underground storage tanks	Nozzle sampling	(k)(4)



(a) 1-Qt Weighted Bottles

(b) 1-Qt Weighted Beaker.

Metric Equivalents

in.	⅛	1	1¾	2¾	3¼	4	10	12	13¾
mm	3	25	45	70	83	102	250	300	350

Figure 2. Assembly for Bottle Sampling

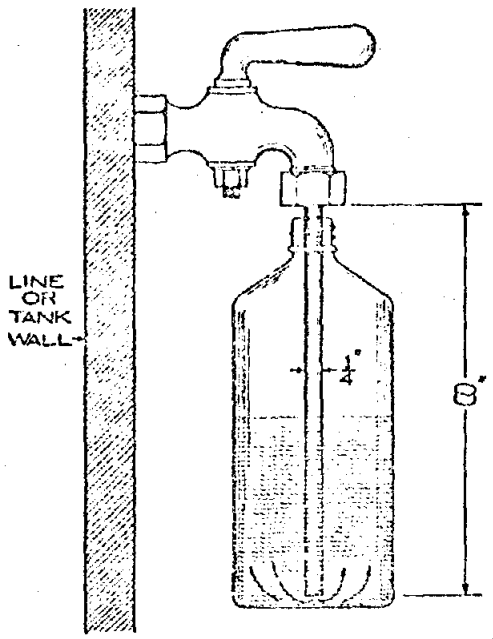


Figure 3. Assembly for Tap Sampling

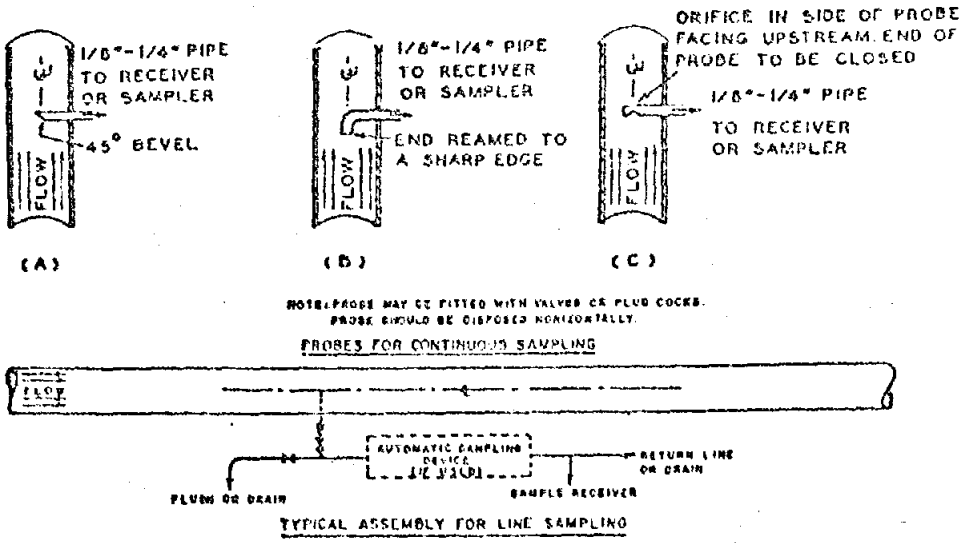


Figure 4. Probes for Continuous Sampling

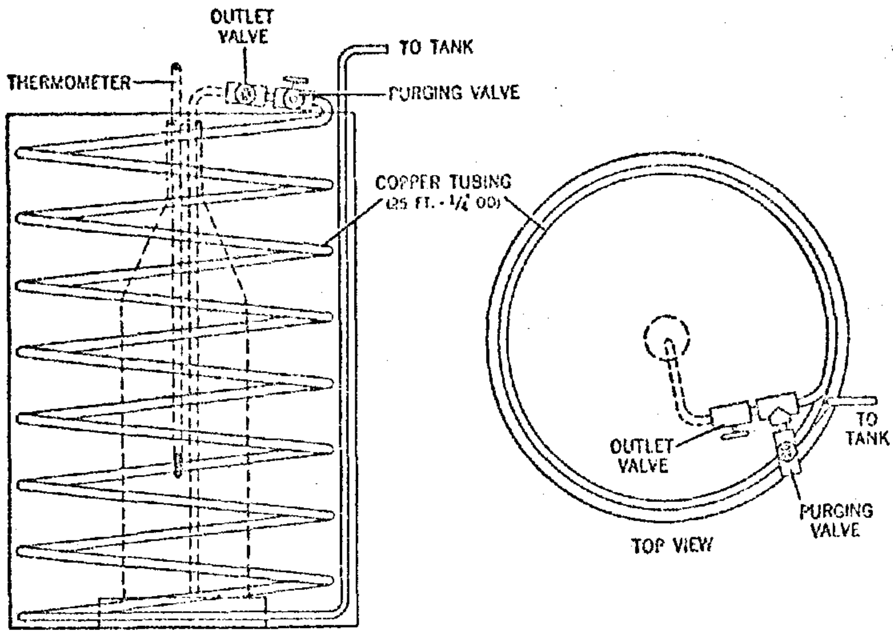
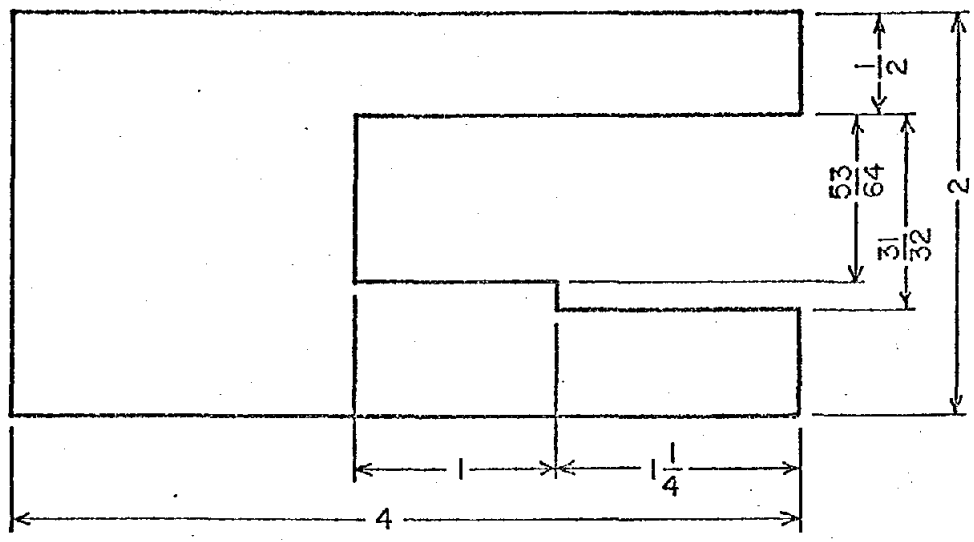
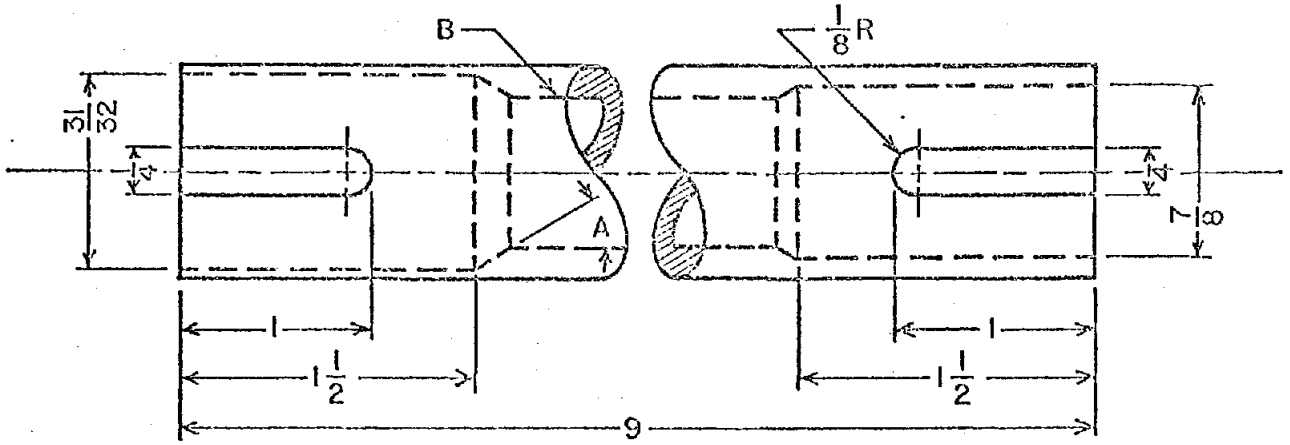


Figure 5. Cooling Bath for Reid Vapor Pressure Sampling



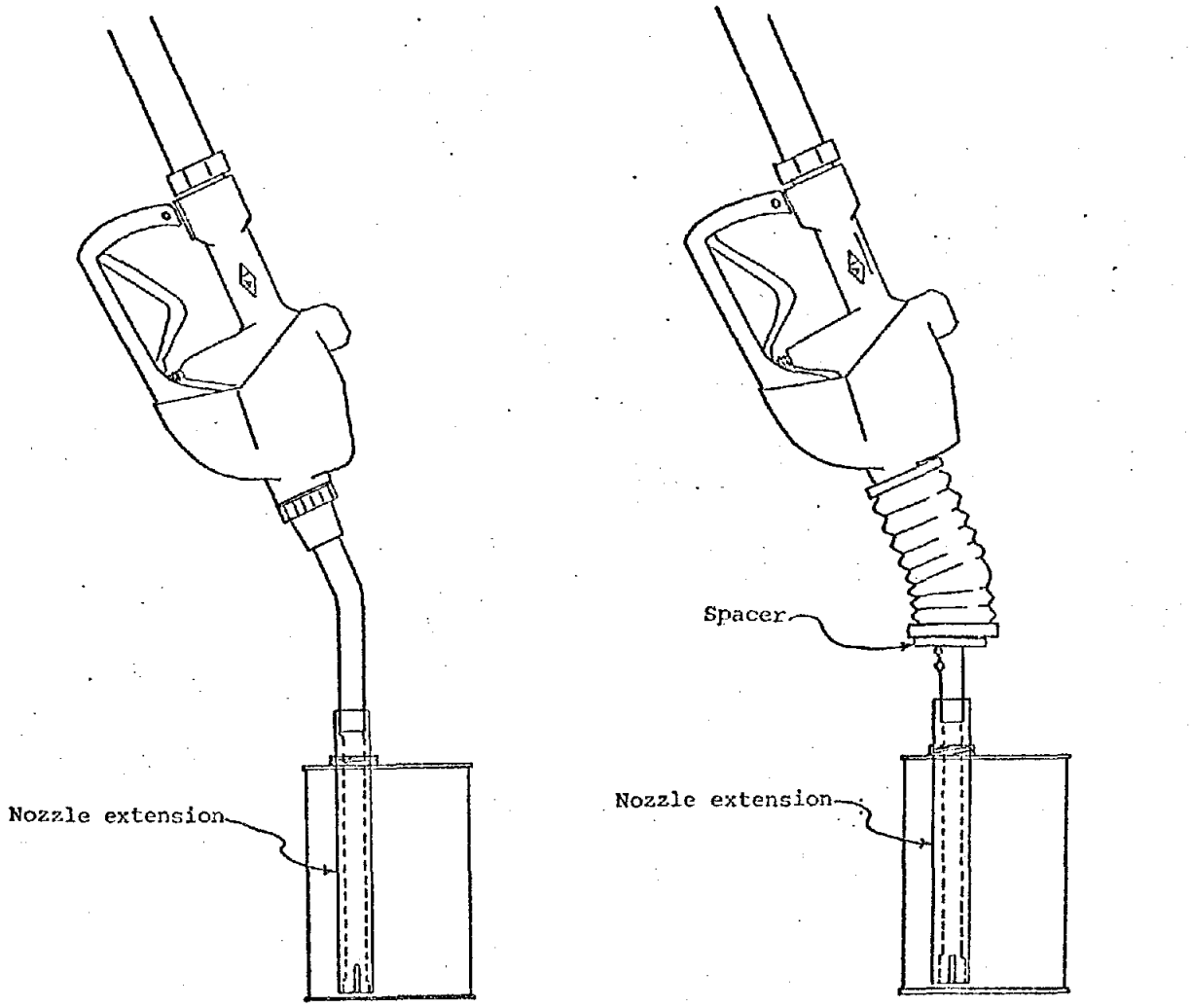
Make from $\frac{1}{4}$ inch flat steel
All dimensions in inches
Break all edges and corners

Figure 6. Spacer for Nozzle Sampling



Use $\frac{3}{4}$ in. Schedule 80 Black Iron Pipe
All dimensions in inches
All tollerences $\pm \frac{1}{128}$ inch
A – Recommend 30°
B – Inside diameter Schedule 80 Black Iron Pipe

Figure 7. Nozzle Extension for Nozzle Sampling



(a) Nozzle without vapor recovery

(b) Nozzle with vapor recovery

Figure 8. Assembly for Nozzle Sampling

State of California
AIR RESOURCES BOARD

Resolution 80-27

June 26, 1980

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (ARB) to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Section 43830 of the Health and Safety Code directs the ARB to establish maximum standards for the volatility of gasoline at nine pounds per square inch Reid vapor pressure (RVP) as determined by the American Society for Testing and Materials (ASTM) test Method D 323-58 or by an appropriate test determined by the ARB;

WHEREAS, Section 2251 of Title 13 of the California Administrative Code, entitled Reid Vapor Pressure of Gasoline, has previously been promulgated in accordance with the provisions of the Health and Safety Code and provides that RVP be determined in accordance with ASTM Method D 323-58;

WHEREAS, paragraph 4(b) of the RVP test method, ASTM Method D 323-58, states that sampling shall be done in accordance with ASTM Method D 270, entitled Standard Method of Sampling Petroleum and Petroleum Products;

WHEREAS, ASTM Method D 270 provides specific sampling procedures for obtaining gasoline samples under certain circumstances but, paragraph 7.1 of this method states that directions for sampling cannot be made explicit enough to cover all cases;

WHEREAS, the staff of the ARB determined that enforcement of Section 43830 of the Health and Safety Code requires taking gasoline samples at the point of sale or supply to motor vehicles and therefore employed a form of tap or continuous sampling during its inspection program during August 1977;

WHEREAS, sales of gasoline with a RVP greater than nine pounds per square inch were documented in August 1977 and complaints were filed against oil companies found to be selling such gasoline; and a lawsuit filed against Mobil Oil Corporation was brought to trial and heard in the Los Angeles Superior Court by Judge Max Wisot and the court's decision stated that the staff of the ARB did not strictly follow ASTM Method D 270 since in the court's opinion the bottle sampling method should have been utilized;

WHEREAS, the bottle sampling method specified in ASTM D 270 is infeasible as an enforcement tool to sample gasoline in underground storage tanks at service stations;

WHEREAS, the ARB has determined that as a result of the potential confusion stemming from the litigation arising from the August 1977 inspection, a specific regulation on obtaining gasoline samples from service station pump nozzles would provide useful clarification of the applicable test procedures;

WHEREAS, Section 43830 of the Health and Safety Code directs that the ARB has the option to establish an appropriate test method to determine the volatility of the gasoline sold in this state;

WHEREAS, the Board finds that Section 2251 as amended and Section 2261 of Title 17, California Administrative Code, are an appropriate test to determine the Reid vapor pressure of gasoline sold in this state; and

WHEREAS, notice of a public hearing to consider the proposed amendments to the RVP of Gasoline regulation and the proposed adoption of a gasoline sampling procedure for the purpose of vapor pressure testing has been given and a public hearing held in accordance with the provisions of the Health and Safety Code and the Administrative Procedure Act (Government Code Section 11371 et seq);

WHEREAS, it is necessary that the changes to regulations contained in Title 13, California Administrative Code, become effective as soon as possible after their adoption so that they will apply to the Board's enforcement of regulatory and statutory provisions governing the volatility of gasoline in the summer months of this year when air pollution problems are at their worst;

NOW, THEREFORE, BE IT RESOLVED that the Board amends Section 2251 and adopts Section 2261 of Subchapter 5, Chapter 3, Title 13, California Administrative Code, as set forth in the attachment hereto, as the test to determine the Reid vapor pressure of gasoline sold in this state;

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to file with the Secretary of State the regulations adopted herein to become effective as soon as possible;

BE IT FURTHER RESOLVED that the ARB delegates to the Executive Officer of the ARB the authority to make further changes to the vapor pressure test and/or sampling methods for gasoline sold in this state based on suitable scientific and/or technical evidence; and

BE IT FURTHER RESOLVED that notwithstanding the amendments to Section 2251 and the addition of Section 2261, Title 17, California Administrative Code, adopted June 26, 1980, the provisions of Section 2251 as they existed prior to the effective date of these amendments shall continue to be operative and effective with respect to the sale or supply of fuel for motor vehicles prior to the effective date of said amendments.

I certify that the above is a true and correct copy of Resolution 80-27 as adopted by the Air Resources Board.

Sally Rump

Sally Rump
Board Secretary

State of California

Memorandum

To : Huey D. Johnson
Secretary
Resources Agency
1416 - 9th Street
Sacramento, CA 95814

Date : June 30, 1980

Subject : Filing of Notice of Decision of the Air Resources Board

From : Air Resources Board

Pursuant to Title 17, Section 60007(b), and in compliance with Air Resources Board certification under section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decision and response to environmental comments raised during the comment period.

Sally Rump
Board Secretary

attachment: Resolution 80-27

RECEIVED BY
Office of the Secretary

JUL 01 1980

Resources Agency of California

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Adoption of Amendments to Title 13, California Administrative Code, Regarding the Revision of the Reid Vapor Pressure of Gasoline Regulation and the Adoption of Sampling Procedures for the Enforcement of Reid Vapor Pressure Limits of Gasoline

Public Hearing Date: June 26, 1980

Response Date: June 26, 1980

Issuing Authority: Air Resources Board

Comment: It has been stated that service station sampling can survey only a minute fraction of the gasoline in California, particularly in relation to bulk terminal or refinery sampling; that bulk terminal and refinery sampling provide an opportunity to remedy problems in gasoline composition not provided by service station sampling; and that for these reasons, bulk terminal sampling is a more effective means of controlling air pollution in California than service station sampling.

Response: The proposed regulatory amendments do not preclude sampling at bulk terminals or refineries. To the extent that service station sampling does not provide the same opportunity as bulk terminal sampling to remedy problems in gasoline composition, bulk terminal sampling remains available as an enforcement option. There is no assurance that in fact Reid vapor pressure violations found at bulk terminals could or would be remedied before the gasoline was distributed for ultimate sale.

CERTIFIED: Signature

Board Secretary

Date: 6-30-80

State of California
AIR RESOURCES BOARD

PUBLIC HEARING TO CONSIDER AMENDMENTS TO TITLE 13, CALIFORNIA ADMINISTRATIVE CODE SECTIONS 2251 AND 2261 REGARDING SAMPLING PROCEDURES FOR THE ENFORCEMENT OF REID VAPOR PRESSURE LIMITS OF GASOLINE

STATEMENT OF OPPOSING CONSIDERATIONS AND AGENCY RESPONSE

1. Opposing Consideration: Several gasoline manufacturers suggest that sampling be conducted only at gasoline bulk marketing facilities and/or refineries so that a large amount of gasoline can be surveyed and so that adjustments to correct the RVP, if necessary, can be made before distribution.

Agency Response: The amendments to the regulation do not preclude enforcement of RVP limitations at bulk terminals or refineries. Under the regulation the sampling may be conducted at any stage in the gasoline distribution system. Enforcement of RVP regulations at the service station may be more cost-effective than enforcement at bulk terminals as the gasoline found at the bulk terminal represents only a single batch. The gasoline in service station storage tanks represents deliveries which have been made over a period of several days thus representing several batches of gasoline. There is no assurance that gasoline found to exceed the RVP limitation at the bulk terminals will be brought into compliance before further distribution.

Additionally, Health and Safety Code Section 43016 is interpreted to require that a violation be found at the point of sale. Only service station sampling can establish this. Service station sampling is also likely to provide a greater deterrent to Reid vapor pressure violations than bulk terminal sampling,

because the potential civil penalties under Section 43016 are far higher than any that could be recovered if sampling were done at bulk terminals or refineries.

The Board expects that enforcement staff will sample at refineries and bulk terminals.

2. Opposing Consideration: Several gasoline manufacturers commented that the pumps which supply the lines to the gasoline dispensers necessarily draw product from close to the bottom of the tank and, therefore, will not provide a representative sample of the product in the tank. It was claimed that only the bottle sampling method would yield representative samples of the gasoline in an underground storage tank.

Agency Response: It is well known that gasoline is highly miscible. Various batches of gasoline added to an underground tank will always be miscible with gasoline already in the tank. Due to turbulent action when a new batch of gasoline is added to a tank, there will be excellent mixing of the total contents. Therefore, it is likely that any sample drawn from an underground tank will be representative of all the contents.

Submersible pumps in wide use in underground tanks at service stations provide additional mixing during their operation, which occurs each time gasoline is dispensed to a vehicle. Thermal gradients existing in an underground storage tank tend to create convective mixing of the contents.

Test data indicate that there is no significant difference in the Reid vapor pressure of gasoline drawn from an underground storage tank by the ASTM bottle method compared to a sample taken from the same tank during the same time period according to the method developed by Chevron Research.

3. Opposing Consideration: Several gasoline manufacturers state in both written and oral comments that nozzle sampling at the service station may cause additional air to become entrained in the gasoline and that this increase in air saturation may raise the Reid vapor pressure result. These manufacturers suggest that the current sampling procedures provided in ASTM D-270 continue to be used for enforcement.

   Agency Response: The consideration is not persuasive because no data or test results were brought before the Board to substantiate this theory. In addition, the data referred to above comparing the proposed nozzle sampling procedures and the widely accepted ASTM bottle method at a service station underground storage tank show no significant difference in RVP results. Any air saturation of gasoline during nozzle sampling is minimal and should not preclude the use of the nozzle sampling method as an enforcement tool.

   The Board will consider at any time reliable evidence tending to show that the test and sampling method for RVP should be amended or improved.

4. Opposing Consideration: Mr. Benshoof, representing Mobil and Gulf, commented that changes in the sampling procedure should be channeled through ASTM.

Agency Response: Complying with this suggestion is inappropriate at this time because of the substantial amount of time it would take for ASTM to amend its sampling procedure. An enforceable gasoline volatility regulation is needed now for the current RVP season. The ASTM would take at least one year to study, evaluate and adopt any changes in its sampling procedure. If and when the ASTM method is altered, the Board will review its regulation governing RVP testing and sampling.

5. Opposing Consideration: A comment from Mr. Ward Benshoof, speaking on behalf of Mobil and Gulf, opposes the proposed amendments because ASTM has revised its reproducibility from 0.3 to 0.7 in the test method D-323 and that the ARB should recognize this change if it amends its regulations.

   Agency Response: The amendments to the regulations concern only gasoline sampling procedures. This comment does not address those procedures.