Original Comments 51-60

Index to Rulemaking File Underground Storage Tank Regulations Title 23, Waters Division 3, Water Resources Control Board Chapter 16, Underground Storage Tank Regulations **1985**

#5 /

Chevron

Schutzky Distributors Inc.
dba Bay Cities Oil Marketers
Jobber, Chevron U.S.A. Inc. **Products**
60 Castro St., P.O. Box 1749, Richmond, CA 94802
Richmond Phone (415) 232-5956 • Oakland Phone (415) 529-2882
San Francisco Phone (415) 824-2266

October 19, 1984

State Water Resources Control Board
P.O. Box 100
Sacramento, Calif 95801

Attn: Mr. Harold Singer - Division
of Technical Services.

Dear Sir:

This letter is in regard to "the adoption of proposed regulations governing underground storage of hazardous substances."

While we, operating a small business in the state, want to do what is necessary to have a satisfactory environment, it appears the proposed regulation exact a tremendous cost to our customers. We are a distributor of motor vehicle fuels in the counties of San Francisco, San Mateo, Alameda, Contra Costa, Solano, Marin, and Napa. We purchase products from refineries and distribute them to a myriad of customers who own their own underground storage tanks - such as bakeries, dairies, food distributors, fire and police stations, school districts, garbage companies, utilities, ambulance companies and hospitals, federal and state agencies, taxi and car rental companies, etc. These customers do not look to a retail service station for their supplies because during a petroleum shortage such as we experienced twice in the last ten years, they simply can't rely on anything other than their own motor vehicle fuel dispensing facilities. If the cost of maintaining such storage prohibits them from so doing, then consider the chaos surrounding the few service stations open during a product shortage when you add the commercial vehicle fleet to the vehicles of the general public - all trying to get fuel. Our state's day-to-day activities will simply grind to a halt !

In reviewing your regulations and the assumptions used in the development thereof, we note you have assumed the <u>average</u> motor vehicle fuel tank has a capacity of 10,000 gallons and that <u>3 tanks</u> are installed at each facility. You are describing a service station. Very few of our customers fit your assumption, almost all of them have much smaller capacity tanks. They were buried underground because of the potential fire hazard and now these people will be required to spend thousands of dollars on monitoring wells, etc. Yet these types of small and medium sized businesses have not been found to be even a minor source of the state's groundwater contamination.

OCT 22 1984

Our experience has been that these people fully understand the economic value of their supplies - which cost in excess of $1.00 per gallon - and they investigate fully any suspected loss. This has been done historically by comparing their inventory plus their fuel deliveries with their consumption.

May we suggest the amendment of your proposed regulations as follows:

> "Existing underground storage tank monitoring as applicable to motor vehicle fuel tanks of less than 10,000 gallons capacity used by activities other than at a retail service station open to the motoring public be satisfied with daily inventory controls and a reasonable tank testing period."

Sincerely,

Victor S. Schutzky

President

VSS/jv

OCT 22 1984

#52

Sacramento Address
State Capitol 95814
Telephone: (916) 445-7558

District Offices
1111 Fulton Mall - Suite 914
Fresno, CA 93721
Telephone: (209) 264-3078

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Hanford, CA 93230
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Merced, CA 95340
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Assembly
California Legislature

JIM COSTA
ASSEMBLYMAN, THIRTIETH DISTRICT

COMMITTEES
Chairman:
Water, Parks & Wildlife
Ways & Means Subcommittee on Resources & Transportation

Member:
Housing & Community Development
Ways & Means
Select Committee on Utility Performance, Rates & Regulation

October 22, 1984

Carole A. Onorato, Chairwoman
State Water Resources Control Board
901 P Street
Sacramento, CA 95814

Re: Proposed Regulations Governing Underground Storage of Hazardous Substances

Dear Carole:

Chapter 1046, Statutes of 1983 (AB 1362, Sher), requires, among other things, that every underground storage tank installed on or before January 1, 1984, and used for the storage of hazardous substances, as defined, be outfitted with a monitoring system capable of detecting unauthorized releases.

On October 23, 1984, the State Water Resources Control Board will hold a hearing on the proposed regulations implementing the provisions of AB 1362 governing underground storage of hazardous substances.

I should like to call to your attention Section 25284.1 (b) (3) of the Sher legislation which specifically relates to monitoring requirements for tanks installed on or before January 1, 1984, containing motor vehicle fuels. Section 25284.1 (b) (3) prescribes a monitoring method for these tanks as follows:

> For monitoring tanks containing motor vehicle fuels, daily gauging and inventory reconciliation by the operator, if inventory records are kept on file for one year and are reviewed quarterly, the tank is tested for tightness hydrostatically or, when appropriate with pressure between three and five pounds, inclusive, per square inch at time intervals specified by the board and whenever any pressurized system has a leak detection device to monitor for leaks in the piping. The tank shall also be tested for tightness

hydrostatically or where appropriate, with pressure between three and five pounds, inclusive, per square inch whenever there is a shortage greater than the amount which the board shall specify by regulation.

The Legislature, in enacting AB 1362, clearly recognized tanks containing motor vehicle fuels as a distinct category of tanks, and specified monitoring methods appropriate for these tanks. However, the "Proposed Regulations Governing Underground Storage of Hazardous Substances" fails to recognize this distinction. I have been assured by your staff that this is an oversight, to be remedied by a redraft of the proposed regulations.

Please advise me of the time, date, and place of your public hearing on the revised draft regulations which do in fact reflect the Legislature's intent in Section 25284.1 (b) (3).

Thank you for your attention to this matter.

Sincerely,

Jim Costa

Jim Costa

CC: Harold Singer
Division of Technical Services
State Water Resources Control Board

Linda Stockdale Brewer, Director
Office of Administrative Law

#53

Chevron

Chevron U.S.A. Inc.
575 Market Street, San Francisco, California
Mail Address: P.O. Box 7006, San Francisco, CA 94120-7006

October 23, 1984

Chevron U.S.A. Inc. Comments Re:
Proposed Regulations to Implement
A.B. 1362 - Underground Storage Tanks

State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95801

Attn: Mr. Harold Singer
Division of Technical Services

Dear Mr. Singer:

Chevron U.S.A. appreciates the opportunity to submit comments on the proposed Subchapter 16 regulations for storage of hazardous substances.

Specific requirements of Article 4 of the proposed regulations are of great concern to us. We believe that proposed regulations in Article 4 differ from the statutory requirements of A.B. 1362 in the following areas:

(i) Local agency discretion to select monitoring alternatives;

(ii) The availability of monitoring alternatives described in the statute;

(iii) Local agency discretion regarding implementation of the groundwater monitoring alternative;

(iv) The necessity of the specific approach proposed in the regulations to achieve the objectives of the statute;

(v) The lack of a separate monitoring alternative for motor vehicle fuel tanks.

Attachment 1 addresses these five issues in greater detail.

Attachment 2 is provided as a summary of the proposed regulations and estimated installation costs per service station.

Some of the technical concerns within Article 4 include the number and depth of slant borings, groundwater monitor wells, and vadose monitor wells. Attachment 3 includes a detailed discussion of our technical concerns regarding Article 4, along with comments on the remaining Articles.

If groundwater monitoring is required by the local agency, Attachment 4 is a proposed monitoring alternative specifically for petroleum products. In light of the arguments made in Attachment 4 regarding the unique physical properties of petroleum products, we believe Article 4 should be reorganized to address motor vehicle fuel tanks and non-motor vehicle fuel tanks separately. This would be consistent with the format of Article 3 and the intent of the statute.

Again, we appreciate the opportunity to share our concerns with you, and will be pleased to work with you and your staff to finalize this regulation.

Sincerely,

R. L. Hartung

Attachments

(1) Discussion of A.B. 1362 Statutory Requirements With Regard to Proposed Regulations
(2) Water Resources Control Board Proposed Underground Storage Tank Monitoring Plan - Installation Costs
(3) Comments on Behalf of Chevron U.S.A. Inc. Regarding the Proposed Subchapter 16 Regulations for Storage of Hazardous Substances
(4) Chevron U.S.A. Proposed Underground Storage Tank Monitoring Plan - Installation Costs

ATTACHMENT I

DISCUSSION OF A.B. 1362 STATUTORY REQUIREMENTS WITH REGARD TO PROPOSED REGULATIONS

SUMMARY OF LEGAL CONCERNS
REGARDING PROPOSED ARTICLE 4

Introduction

The regulations proposed in Article 4 for the monitoring of existing underground hazardous substance storage tanks raise several legal concerns. The following are the issues of principal concern:

1) The lack of local agency discretion to select monitoring alternatives.

2) The failure to allow use of the monitoring alternatives described in the statute.

3) The lack of local agency discretion regarding implementation of the groundwater monitoring alternative.

4) The lack of substantial evidence demonstrating the necessity of the specific approach taken in Article 4 to achieve the aims of the statute.

These issues are discussed in more detail below. In addition, a final comment briefly discusses the justification for including a separate monitoring alternative specifically for motor vehicle fuel tanks.

Discussion

1) Local agency discretion to select monitoring alternatives

The regulations proposed in Article 4 for monitoring existing underground tanks are inconsistent with the statute because they do not allow local agencies the discretion required by the statute to choose between monitoring alternatives. By thus limiting local agency discretion, the State Water Resources Control Board ("SWRCB") would exceed its own authority to provide monitoring alternatives under the statute.

a) Statutory provisions

The statutory provisions for existing underground storage tanks appear in Health and Safety Code section 25284.1. Subdivision (a) of that section requires facilities with such tanks to be outfitted with a monitoring system capable of detecting unauthorized releases of hazardous substances stored in the facility. For this purpose, subdivision (b) requires that a means of visual inspection be provided wherever practical. Subdivision (b) also provides, however, that:

> "Alternative methods of monitoring the tank on a monthly, or more frequently basis, may be required by the local agency, consistent with the regulations of [SWRCB]. The alternative monitoring methods include, but are not limited to, [three methods described in the statute]" (emphasis added).

b) Proposed regulations

The regulations proposed in Article 4 to implement these statutory provisions set forth requirements for several different types of monitoring. However, with some exception for tanks that can be visually inspected, the different types of monitoring are provided, not as alternatives, but as components of a single, complex monitoring system. The local agency generally must require use of this complex system whenever full visual inspection cannot be provided. Thus the regulations do not provide local agencies with any real alternatives, much less with discretion to select between such alternatives. The local agencies also are not provided any discretion to develop their own monitoring alternatives.

c) Discussion

This failure to allow local agencies discretion to determine which of several alternatives is appropriate for any given tank is inconsistent with the statute. One infers from the statements in subdivision (b) of Health and Safety Code section 25284.1 quoted above that the Legislature intended SWRCB to adopt regulations that either provide monitoring alternatives or that allow local agencies to define monitoring alternatives. Indeed, it appears that at least the three alternatives described in the statute must be available to local agencies. One also infers that the Legislature intended the regulations to allow local agencies the discretion to select the alternatives to be applied in any particular case. Otherwise, no purpose is served by the statement in subdivision (b) of section 25284.1 that monitoring alternatives may be required by local agencies. By denying local agencies the discretion mandated in the statute, SWRCB would also exceed its own statutory authority.

2) Availability of alternatives described in the statute

The proposed system is also inconsistent with the statute in that it does not allow use of any one of the specific alternatives required by the statute. The alternatives described in the statute are:

(i) Pressure, vacuum or hydrostatic testing;

(ii) Groundwater monitoring well(s) combined with soil analysis upon well installation and, when appropriate, vapor analysis; and

(iii) Inventory control plus tank testing for motor vehicle fuel tanks.

As mentioned above, the language of the statute appears to require that at least these three alternatives be available to local agencies.

In contrast, the regulations require as a single system, visual inspection, soil testing, tank testing, inventory control, vadose zone monitoring and groundwater detection and assurance monitoring. Thus the regulatory system requires a combination of elements from all three of the statutory alternatives plus the additional elements of vadose zone monitoring and slant boring. Furthermore, the regulations do not provide any alternative specifically for motor vehicle fuel tanks.

3) Local agency discretion regarding implementation of groundwater monitoring alternative

The statute also provides local agencies discretion in implementing the groundwater monitoring alternative. Article 4 is inconsistent with the statute in that Article 4 does not afford local agencies this discretion.

a) Statutory provision

The statute describes the groundwater monitoring alternative as follows:

> "A groundwater monitoring well or wells which are down gradient and adjacent to the underground storage tank, vapor analysis within a well where appropriate, and analysis of soil borings at the time of initial installation of the well. [SWRCB] shall develop regulations specifying monitoring alternatives. The local agency * * * shall approve the location and number of wells, the depth of wells and the sampling frequency, pursuant to these regulations" (Health & Saf.Code, § 25284.1(b)(2); emphasis added).

b) Discussion

The quoted language clearly directs SWRCB to adopt monitoring alternatives, rather than a single monitoring method. Further, the last sentence of the quoted provision indicates that the Legislature intended the local agencies to have discretion to determine the appropriate number, depth and location of wells and the appropriate sampling frequency for any given tank. The proposed regulations, however, essentially specify the configuration of wells and the minimum monitoring frequency that the local agency must require for any given tank. In addition to being inconsistent with the statute, this system would actually prevent local agencies from taking into consideration the site-specific factors that are relevant to determining the elements of the groundwater monitoring system actually needed to detect unauthorized releases. For example, local agencies could not consider factors such as the nature of the substance in the tank, the nature of the soil layers beneath the tank, the direction and rate of groundwater flow and the other types of monitoring to be performed. Thus, in many cases, the proposed regulations would force local agencies to require a groundwater monitoring system that is not necessary to achieve the aims of the statute.

One can also argue that the regulations are inconsistent with the statutory groundwater monitoring alternative in another aspect. The statute calls for analysis of the soil removed from the groundwater well or wells upon initial installation. The regulations, however, require the drilling of separate, slant-drilled wells to perform soil analysis.

4) <u>Necessity of the specific measures proposed</u>

To be valid, a regulation must be reasonably necessary to effectuate the purposes of the statute (Gov.Code, § 11342.2). In addition, the Office of Administrative Law is specifically required to review the regulations against a standard of "necessity" (Gov.Code, § 11349.1). This standard defines "necessity" to mean that "the rulemaking proceeding demonstrates by substantial evidence the need for the regulation" (Gov.Code, § 11349(a)).

Health and Safety Code section 25284.1 clearly indicates that the purpose of monitoring existing underground storage tanks is to detect current or future unauthorized releases of any hazardous substances stored in such tanks. That section also provides several specific alternatives presumably intended to achieve this aim. In a number of areas, technical analysis indicates that the specific measures required by the regulations are not necessary either to detect unauthorized releases or to implement the specific alternatives provided for this purpose. Moreover, the Statement of Reasons generally provides little or no factual basis for the specific requirements proposed in these areas. Therefore, we question the adequacy of the justification provided and the validity of the regulations in these areas.

This concern and the supporting technical analysis have already been discussed briefly with SWRCB members, and detailed technical analysis will be submitted at the hearing to be held on October 23, 1984. Therefore, the following discussion is intended simply to highlight the areas of concern that will be discussed more fully in the later comments.

a) <u>Redundancy of monitoring methods</u>

The principal area of concern involves the requirements in Article 4 that impose redundant monitoring methods. As discussed above, none of the monitoring alternatives specified in the statute require the full complement of methods potentially required by Article 4. Further, as the technical analysis to be submitted at the hearing will show, the methods required by Article 4 overlap to a degree that is not necessary to assure adequate leak detection. This analysis will address the following requirements:

(i) Separate slant boring;

(ii) Vadose zone monitoring in areas where groundwater rises above five feet below the tank bottom;

(iii) Groundwater monitoring in areas where groundwater is quite far below the tank bottom;

(iv) Continuous vapor monitoring;

(v) Weekly groundwater monitoring;

(vi) Number, location, depth and construction of groundwater wells.

b) <u>Requirements directly contrary to statutory purpose</u>

Technical analysis also indicates that certain requirements are unnecessary because they are contrary to the general purpose of the statute, which is to protect groundwater from contamination. Examples are the requirements to drill wells and install perforated casings to specified depths without regard to the possibility that such wells will breach competent aquitards. Breaching a competent aquitard destroys natural protection against groundwater contamination. Further, the perforated casings can create a direct pathway to spread the contamination.

c) <u>Identification of past contamination and general water quality</u>

A final area of concern involves the regulatory provisions that either state or have as a purpose the detection of past releases or the direct monitoring of groundwater without regard to the need for such measures to detect current or future releases. Examples appear in subdivisions (a) through (c) of section 2640 of the regulations. Unless information regarding past contamination is needed to detect current or future leaks, monitoring for past contamination is not necessary to achieve the aims of the statute and therefore should not be required in these regulations. Furthermore, even where information regarding past contamination is needed to achieve the statutory goals, the regulations should not require separate, additional borings for this purpose in cases where the monitoring alternative selected by the local agency requires monitoring wells that will yield soil samples.

5) Justification for a special alternative for motor vehicle fuel tanks

Inclusion of a separate alternative in Article 4 for motor vehicle fuel tanks is appropriate for several reasons. First, motor vehicle fuel tanks constitute a relatively large portion of all underground tanks. Indeed, SWRCB Staff estimates that over two-thirds of all underground hazardous substance storage tanks are motor vehicle fuel tanks. Second, as was discussed with SWRCB members and as the technical analysis to be presented will show, special monitoring systems can be designed for these tanks based on the particular properties of motor vehicle fuel that affect its migration and detection. Third, significant efforts have already been made by the petroleum industry to design systems to address the problems of leaky tanks. The results of these efforts may affect the need for additional measures required to achieve the aims of the statute.

In addition, support for a separate motor vehicle fuel alternative appears in the statute itself. The statute includes several provisions addressing motor vehicle fuel tanks separately from other kinds of tanks. These provisions appear in both the new and existing tank standards as well as the tank repair provision. One infers from these provisions that the Legislature recognized that motor vehicle fuel tanks warrant separate consideration.

It should also be pointed out that the definition proposed in the regulations for "motor vehicle", and hence for "motor vehicle fuel tank", is unnecessarily narrow (proposed § 2620). "Motor vehicle" is defined to include only vehicles used on highways. Consequently, the term "motor vehicle fuel tank" is limited to tanks storing fuels for such vehicles only, even though fuels for other vehicles have the same or similar properties from the standpoint of leak detection. The concern under the statute is detection of a hazardous substance if it leaks and not the type of vehicle the substance is used in. Therefore, motor vehicle fuel should be defined to include all motor vehicle fuels and not just those fuels used in highway vehicles.

ATTACHMENT 2

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

LIST OF CHARGES

Equipment

Truck-mounted Hollow Stem Auger with Operator and Helper	$100.00 to $150.00/hr
Pumping Truck and Equipment	$600.00/day

Personnel Rates

Registered Professional	$60.00 to $100.00/hr
Engineer/Geologist	$40.00 to $60.00/hr
Technician or Aide	$30.00/hr

Materials

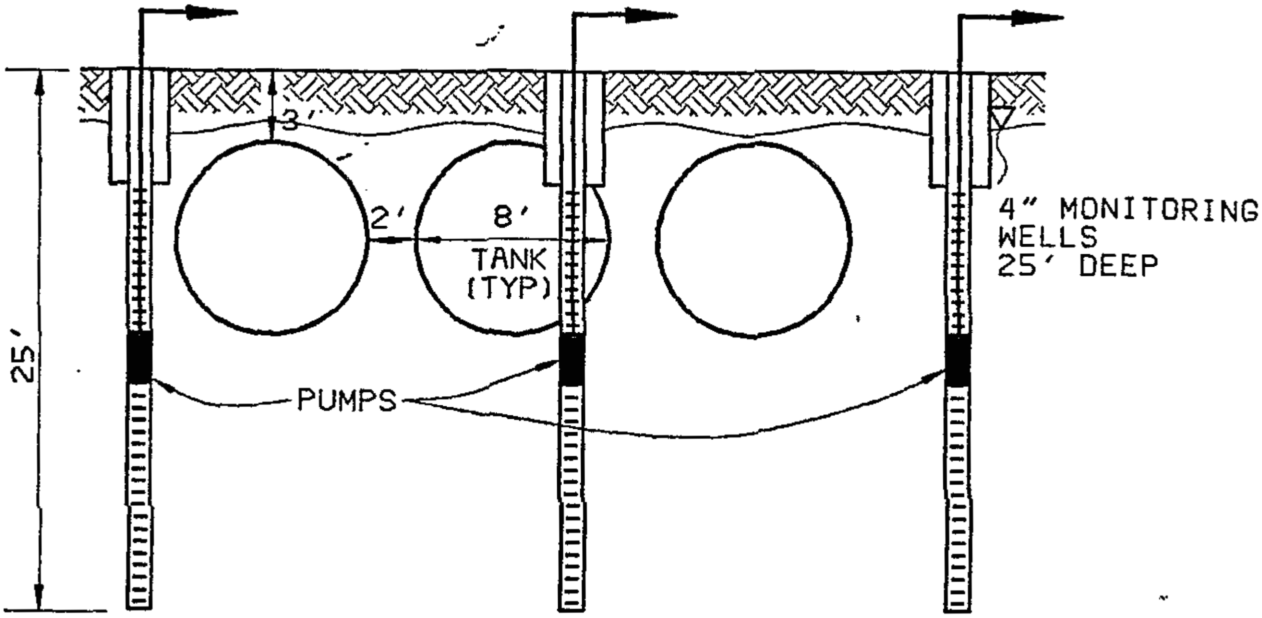
Slotted Casing (4-inch PVC)	$6.50/ft
Slotted Casing (2-inch PVC)	$4.50/ft
Solid Casing (4-inch PVC)	$5.00/ft
Solid Casing (2-inch PVC)	$4.00/ft
Annular Material (sand, grout, etc.)	$1.50/ft
Well Covers	$50.00 to $150.00/ea
Cement	$125.00/$yd^3$

Material Testing

Soil Analyses (EPA Method 602)	$50.00 to $150.00/sample
Vapor Analyses	$100.00/sample

CASE I

GROUND WATER 0 TO 5 FEET BELOW GRADE



GROUND WATER MONITORING SHALL BE INSTALLED WHEREVER GROUND WATER IS LESS THAN 5' BELOW GRADE.

WELLS SHALL BE INSTALLED AT 120° SPACING AROUND THE TANK OR FACILITY. DISTANCE BETWEEN WELLS SHALL NOT BE GREATER THAN 30'. THIS WILL REQUIRE 3 WELLS FOR EVERY WASTE OIL TANK AND AT LEAST 4 FOR EVERY 3 PRODUCT TANKS. TOTAL: MINIMUM 7 WELLS

WELLS SHALL BE MONITORED A MINIMUM OF ONCE PER WEEK.

PUMP SHOULD BE CAPABLE OF DRAWING WATER 10' BELOW TOP OF PERFORATIONS.

COST: $15,700 - $24,400
PER SERVICE STATION

G0056 (G 01) TWL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE I (Ground Water 0 to 5 feet below grade)

Requirements:

- o Seven groundwater monitor wells.
- o Seven dewatering pumps.

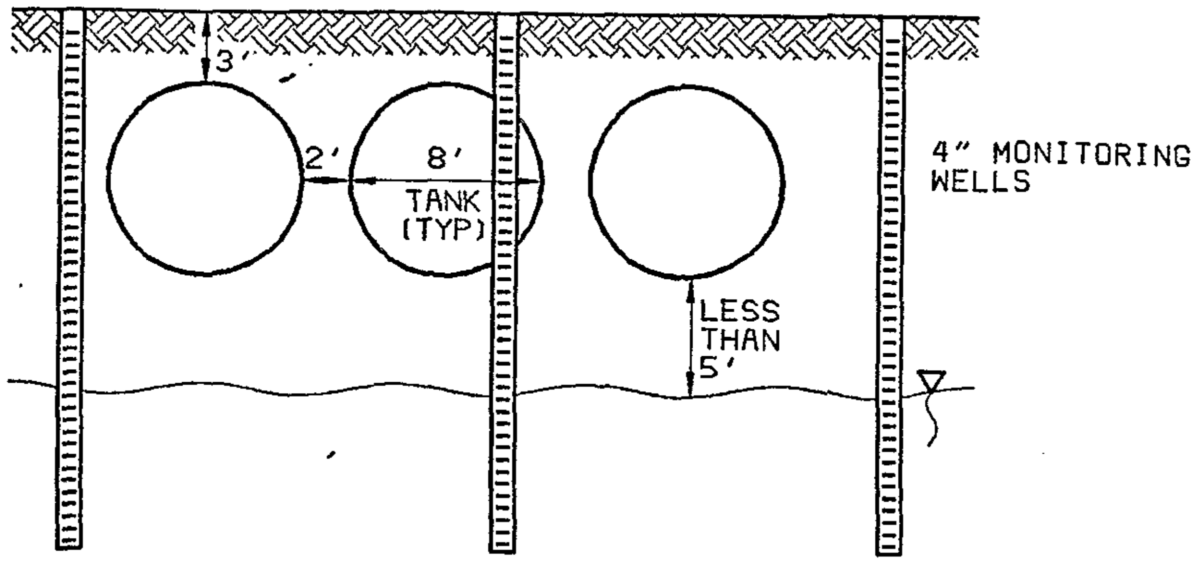
Itemized Costs:

Drilling	20 hours*	$2,000 to $3,000
Casing (4-inch PVC)	175 feet	$1,100
Annular Material	175 feet	$260
Pumps	7 @ $1,000 to $1,500	$7,000 to $10,500
Well Covers	7 wells	$350 to $1,050
Registered Professional	32 hours	$1,920 to $3,200
Technician	16 hours	$480
Well Development	1 day	$600
Waste Removal	7 bbls.	$220
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$15,700 to $24,400

* Assumes No Difficulties During Drilling.
** No Continuous Monitoring Equipment Included.

CASE II

GROUND WATER 5 FEET BELOW GRADE TO 5 FEET BELOW TANK INVERT



GROUND WATER MONITORING SHALL BE INSTALLED WHEREVER GROUND WATER IS LESS THAN 5' BELOW THE TANK BOTTOM.

WELLS SHALL BE INSTALLED AT 120° SPACING AROUND THE TANK OR FACILITY. DISTANCE BETWEEN WELLS SHALL NOT BE GREATER THAN 30'. THIS WILL REQUIRE 3 WELLS FOR EVERY WASTE OIL TANK AND AT LEAST 4 FOR EVERY 3 PRODUCT TANKS. TOTAL: MINIMUM 7 WELLS

WELLS SHALL BE MONITORED A MINIMUM OF ONCE PER WEEK.

VADOSE ZONE DETECTION MONITORING IS REQUIRED.

COST: #15,900 - #25,300
PER SERVICE STATION

G00056 (G0 2) THL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE II (Ground Water 5 feet below grade to 5 feet below tank invert)

Requirements:

- o Seven groundwater monitor wells.
- o Six vadose monitor wells.
- o Four slant soil borings.

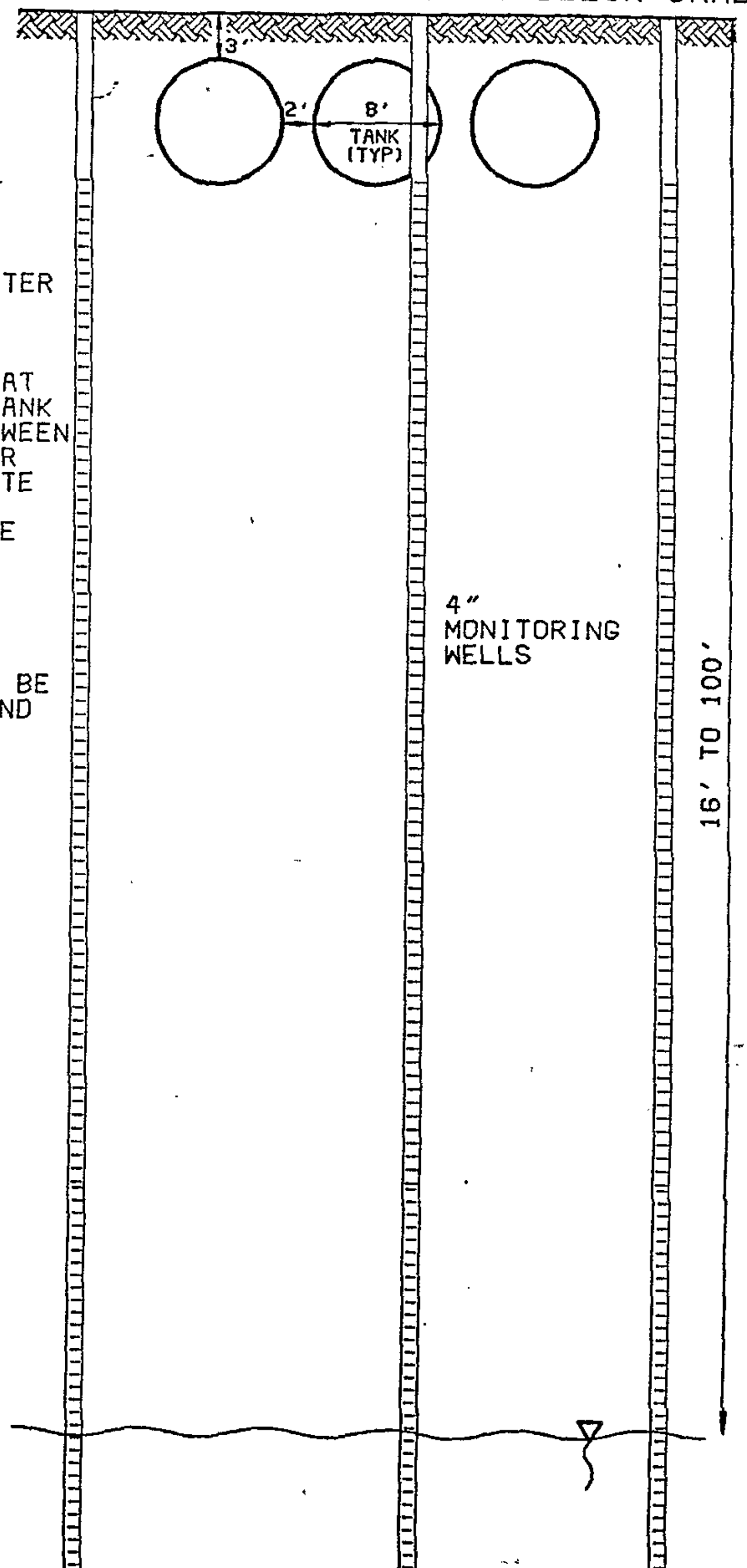
Itemized Costs:

Drilling	40 hours*	$4,000 to $6,000
Casing (4-inch PVC)	370 feet	$2,300
Annular Material	370 feet	$550
Well Covers	13 wells	$650 to 1,750
Registered Professional	60 hours	$3,600 to $6,000
Technician	24 hours	$720
Well Development	1 day	$600
Soil Borings	8 hours	$800 to $1,200
Soil Analyses	8 to 16 samples	$400 to $2,400
Vadose Demonstration		
Professional	12 hours	$480 to $800
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	14 bbls.	$390
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$15,900 to $25,300

* Assumes No Difficulties During Drilling.
** No Continuous Monitoring Equipment Included.

CASE III

GROUND WATER 5 FEET BELOW INVERT TO 100 FEET BELOW GRADE



NOT REQUIRED IF GROUND WATER IS LESS THAN 16' FROM THE SURFACE.

WELLS SHALL BE INSTALLED AT 120° SPACING AROUND THE TANK OR FACILITY. DISTANCE BETWEEN WELLS SHALL NOT BE GREATER THAN 30'. BETWEEN THE WASTE OIL & PRODUCT TANKS A MINIMUM OF 7 WELLS WILL BE REQUIRED.

WELLS SHALL BE MONITORED SEMI-ANNUALLY.

EXPLORATORY BORINGS SHALL BE DRILLED TO DETERMINE GROUND WATER ELEVATION.

COST: $29,400 - $45,700
PER SERVICE STATION

G00056 (G[illegible]603) TWL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND
STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE III (Ground Water 5 feet below tank invert to 100 feet below grade)

Requirements:

- o Seven groundwater monitor wells.
- o Six vadose monitor wells.
- o Four slant soil borings.

Itemized Costs:

Drilling	64 hours*	$6,400 to $9,600
Casing (4-inch PVC)	790 feet	$4,985
Annular Material	790 feet	$1,185
Well Covers	13 wells	$650 to $1,950
Registered Professional	104 hours	$6,240 to $10,400
Technician	36 hours	$1,080
Well Development	2 days	$1,200
Soil Borings	24 hours	$2,400 to $3,600
Soil Analyses	52 samples	$2,600 to $7,800
Vadose Demonstration		
Professional	12 hours	$720 to $1,200
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	35 bbls.	$730
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$29,400 to $45,700

* Assumes No Difficulty During Drilling.
** No Continuous Monitoring Equipment Included.

CASE IV

GROUND WATER 100 FEET TO 200 FEET BELOW GRADE

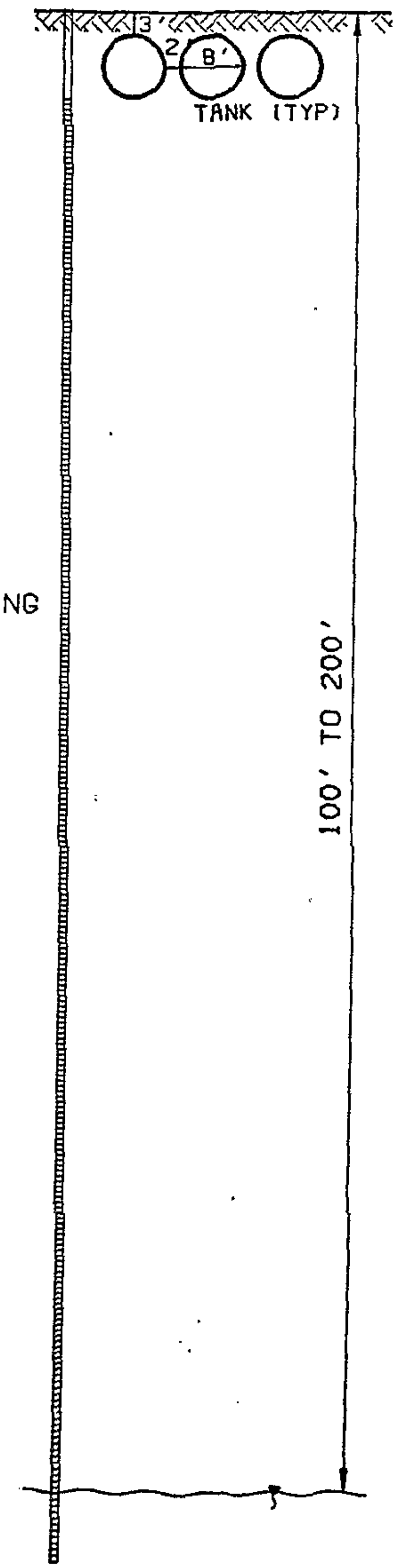
ONLY ONE DOWNGRADIENT WELL
REQUIRED.

NOT REQUIRED IF GROUND WATER
IS GREATER THAN 200'

SHALL BE MONITORED SEMI-ANNUALLY

EXPLORATORY BORINGS SHALL
BE DRILLED TO DETERMINE
GROUND WATER ELEVATION.

4"
MONITORING
WELLS



COST: #19,600 - #32,700
PER SERVICE STATION

G00056 (G0604) TWL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE IV (Ground Water 100 feet to 200 feet below grade)

Requirements:

- o One groundwater monitor well.
- o Six vadose monitor wells.
- o Four slant soil borings.

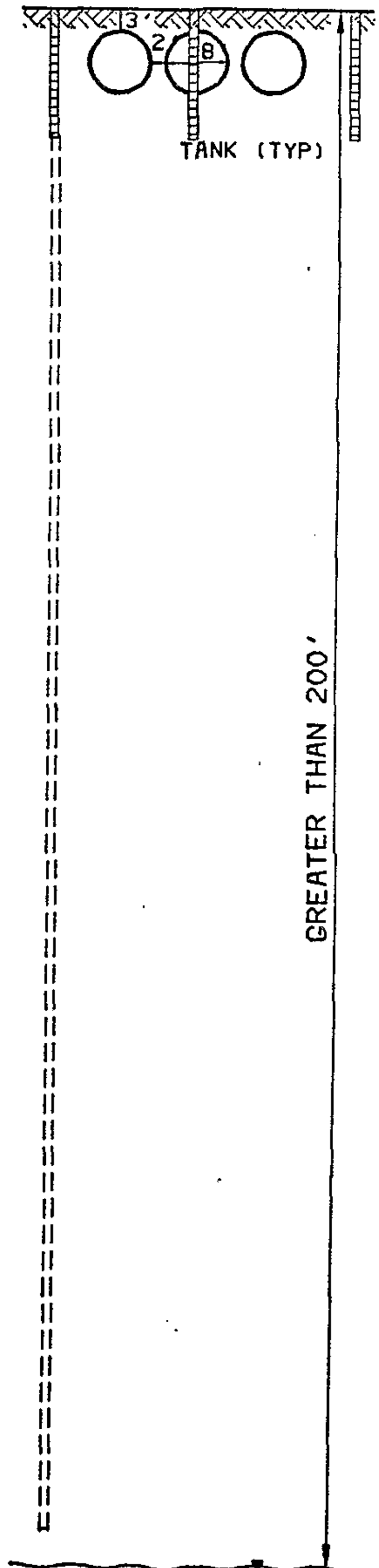
Itemized Costs:

Drilling	36 hours*	$3,600 to $5,400
Casing (4-inch PVC)	290 feet	$1,645
Annular Material	290 feet	$570
Well Covers	7 wells	$350 to $1,050
Registered Professional	72 hours	$4,320 to $7,200
Technician	20 hours	$600
Well Development	1 day	$600
Soil Boring	24 hours	$2,400 to $3,600
Soil Analyses	52 samples	$2,600 to $7,800
Vadose Demonstration		
Professional	12 hours	$720 to $1,200
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	10 bbls.	$300
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$18,900 to $32,000

* Assumes No Difficulty During Drilling.
** No Continuous Monitoring Equipment Included.

CASE V

GROUND WATER GREATER THAN 200 FEET BELOW GRADE



EXPLORATORY BORINGS SHALL BE DRILLED TO DETERMINE GROUND WATER ELEVATION.

VADOSE ZONE MONITORING IS REQUIRED.

ASSURANCE WELL IS BACKFILLED IF GROUND WATER IS GREATER THAN 200'.

COST: $17,400 - $30,400
PER SERVISE STATION

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE V (Ground Water greater than 200 feet below grade)

Requirements:

- o One exploratory boring to 200 feet.
- o Six vadose monitor wells.
- o Four slant soil borings.

Itemized Costs:

Drilling	36 hours*	$3,600 to $5,400
Casing (4-inch PVC)	90 feet	$540
Cement Seal	7 yd^3	$875
Annular Material	90 feet	$135
Well Covers	6 wells	$300 to $900
Registered Professional	72 hours	$4,320 to $7,200
Technician	16 hours	$480
Soil Borings	24 hours	$2,400 to $3,600
Soil Analyses	52 samples	$2,600 to 7,800
Vadose Demonstration		
Professional	12 hours	$720 to $1,200
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	10 bbls.	$300
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$17,400 to $30,400

* Assumes No Difficulty During Drilling
** No Continuous Monitoring Equipment Included.

ATTACHMENT 3

COMMENTS ON BEHALF OF CHEVRON U.S.A. INC. REGARDING THE PROPOSED SUBCHAPTER 16 REGULATIONS FOR STORAGE OF HAZARDOUS SUBSTANCES

COMMENTS

On Behalf of

CHEVRON U.S.A. INC.

Before the

STATE WATER RESOURCES CONTROL BOARD

October 23, 1984

Re: Proposed Subchapter 16 Regulations for Storage of Hazardous Substances

Chevron ("CUSA") wishes to thank the State Water Resources Control Board (the "Board") for the opportunity to submit comments on the proposed regulations for the storage of hazardous substances (the "Subchapter 16 regulations"). The majority of our comments are found in the section-by-section analysis which follows. These commments set forth our concerns with the proposed regulations and, in many cases, suggest language to address those concerns. However, before we begin our section-by-section analysis, there are a few major comments we would like to address.

To begin, the schedule for adopting these regulations was not reasonable. Draft regulations should have been circulated much earlier in the development process and workshops should have been held before the regulations were proposed for adoption (such as the approach of holding numerous workshops prior to the adoption of the Subchapter 15 regulations) so that information could have been exchanged before the staff and industry as to what is or is not technically feasible and the costs of various proposals.

By comparison, it appears to us that the proposed Subchapter 16 regulations were developed with insufficient interchange between staff and industry. At the first workshop held on May 17, 1984, only incomplete portions of the regulations were available for review and discussion. At the August 30, 1984 workshop, the 8-13-84 draft regulations were used for discussion. The financial impact statement, statement of reasons, and the 8-23-84 version of the draft regulations were not available. The 8-23-84 version of the draft regulations is the version which went out for comment with the public hearing notice. All subsequent workshops were held after the notice of public hearing was published. This meant that no changes to the regulations could be made prior to the public hearing. This does not seem to be the optimum method for developing a complex set of regulations such as these.

We realize the short adoption schedule is primarily due to the deadlines found in the statute. However, state law also requires that public hearings be fair. (California Hotel and Motel Assn. v. Industrial Welfare Comm., 25 Cal.3d 200, 212, 157; Cal. Rptr. 840, 847 (1979) (an administrative agency must employ "fair procedures.") Accordingly, we believe additional workshops should be held and that at the very least a second round of public comments and another hearing should occur before the regulations are adopted.

Turning now to our substantive comments, CUSA believes that the most significant problem with the proposed Subchapter 16 regulations is that they go far beyond the authority granted to the Board by the statute, especially with regard to the monitoring requirements for existing underground storage tanks (those installed on or before January 1, 1984).

To illustrate some of the major inconsistencies, a brief review of the statute is in order.

Health and Safety Code § 25284.1 requires a tank owner to outfit a tank facility with a monitoring system capable of detecting unauthorized releases of any hazardous substances stored in the tank and to monitor the facility thereafter. § 25284.1 (a)(2). One approved monitoring system is to provide for visual inspection of the tank. § 25284.1 (b). Where visual monitoring is not practical, a local agency may require alternative monitoring methods on a monthly, or more frequent basis. § 25284.1(b). The statute lists the following, noninclusive, alternative methods: (1) precision testing of the tank and associated piping as defined in a National Fire Protection Association pamphlet; (2) groundwater monitoring wells, with well location, number, depth, and sampling frequency to be approved by the local agency; (3) a continuous leak detection and alarm system in monitoring wells adjacent to the tank, approved by the local agency; or (4) in the case of motor vehicle fuel tanks only, daily gauging and inventory reconciliation, combined with pressure line leak detectors and a tank integrity testing program.

The Legislature plainly provided in the statute that existing underground storage tanks (UST) be either capable of visual inspection for leaks or that <u>alternative</u> leak monitoring methods could be employed. Moreover, recognizing that motor vehicle fuel tanks are typically more closely monitored than other USTs, the Legislature provided specifically for the alternative of daily inventory control for such tanks.

Article 4 of the proposed Subchapter 16 regulations, however, ignores the statutory language and grants to the Board powers the

Legislature intended to give to the local agencies. For example, where the statute provides that local agencies may require alternative monitoring methods where visual inspection of a UST is impracticable, the proposed regulations would require the tank owners to undertake all of several monitoring methods. Under Article 4 of the proposed Subchapter 16 regulations, if visual monitoring is impracticable, UST owners (unless they fall under very narrow and specific exemptions) must take daily inventory control measurements, drill exploratory soil borings, install either vadose zone detection monitoring or groundwater monitoring, and, if vadose zone detection is employed, provide for assurance groundwater monitoring. These regulations totally ignore the Legislature's clear direction that these monitoring methods are alternatives and that each method should not be required in every case.

Moreover, by requiring each alternative method to be used in all cases, the proposed Subchapter 16 regulations violate the statute's clear direction that the local agency be the body to determine which monitoring alternative should be employed. Section 25284.1(b) states that "Alternative underlying methods of monitoring the tank on a monthly or more frequent basis may be required by the local agency, consistent with the regulations of the Board." (Emphasis supplied.) This section makes no sense if every alternative method is to be required in every case. Thus, the Legislature gave the responsibility to determine which of the various monitoring alternatives should be employed in a given case to the local agency, the body most familiar with the particular ground water and soil conditions in an area. As presently written, the proposed regulations usurp this function in favor of the Board and, thus, exceed the Board's statutory authority.

The proposed regulations also violate the Legislature's expressed intention that motor vehicle fuel tanks be treated differently from other tanks because they are routinely subject to daily inventory control and reconciliation. As written, the proposed Subchapter 16 regulations require motor vehicle fuel tank owners to install all of the monitoring systems as are required for other types of USTs.

Finally, the regulations state that one of the objectives of the monitoring program is "to determine if unauthorized releases . . . have occurred in the past." (Subsection 2640(b).). Subsection 2644(a), requiring soil testing, was expressly included "to determine if prior usage of the underground storage tank has resulted in an unauthorized release." Nothing in the statute gave the Board authority to search for past unauthorized releases. Health and Safety Code § 25284.1 speaks only of "a monitoring system capable of detecting unauthorized releases" of hazardous substances. It says nothing of <u>past</u> "unauthorized releases." In addition, the only reference to soil borings in § 25284.1(b)(2) states that one alternative monitoring method, groundwater monitoring wells, must include an "analysis of soil borings at the time of initial installation of the well." This section appears to require soil borings in order to establish a baseline if groundwater monitoring is the chosen alternative. This is significantly different from the proposed regulations which mandate soil borings in an effort to find past unauthorized releases.

CUSA's intent in making these general comments is to focus the Board's attention on the fact that as written, the proposed Subchapter 16 regulations clearly fail to meet the OAL Standards that all new regulations must meet. The Administrative Procedures Act requires the Board to establish clear and workable regulations to implement the Legislature's intention to address the important issue of regulating underground storage tanks.

We now turn to our comments on specific sections of the proposed regulations.

Section-by-Section Analysis

Article 1

2611. Exemptions

The exemption for USTs located in counties or cities that adopted their own UST ordinances prior to January 1, 1984, should be revised for purposes of clarity and to conform to the exemption in Health and Safety Code § 25288, which sets forth the minimum requirements that must be met by such cities and counties. We suggest amending subsection (a)(1) as follows:

> "Underground storage tanks that are located within the jurisdictions of counties or cities where the county or city had, prior to January 1, 1984, adopted an ordinance which, at a minimum, meets the requirements of Health and Safety Code Section 25288."[1/]

Since subsections (A)-(D) merely paraphrase the statute, they should be deleted.

1/ Changes in existing regulatory language are shown by underlining.

Article 2

2620. Definitions

"Motor Vehicle"

The definitions of "motor vehicle and "motor vehicle fuel tank," which are used later in the special construction and monitoring sections for such tanks, cause tanks storing fuels used to propel vehicles which move "upon a highway" to be treated differently from tanks used to store the same types of fuels for boats, airplanes and trains. Since 1) "motor vehicle" is not defined in the statute, 2) the statute does not differentiate between fuels used in motor vehicles and fuels used in trains and airplanes, and 3) the intent of the statute is to control the storage of fuels, not vehicles, we suggest for clarity deleting the definitions of "motor vehicle" and "motor vehicle fuel tank" and adding a new definition as follows:

"'Motor vehicle fuel' means a fuel that is intended to be used primarily in a self-propelled device by which any person or property may be propelled or moved."

"Pipe"

As currently written, the definition of "pipe" would include vent lines and vapor recovery lines. To exempt those lines which do not normally contain product, we suggest adding the underlined language so that the definition reads as follows:

"'Pipe' means any pipeline or system of pipelines which under normal operating conditions contains liquid and which is used in connection with hazardous substances in interstate or intrastate commerce or to transfer hazardous materials in bulk to or from a marine vessel."

This change will clarify the definition and make it consistent with the statute, which defines "pipe" to include pipes used in the "storage" of hazardous substances. (Health and Safety Code § 25280(q).) In connection with our suggestion above, the words "including connecting piping" should be deleted from the definitions of "tank" so that the definition would read as follows:

> "'Tank' means any single container which is used for the storage of hazardous substances and which is substantially or totally beneath the surface of the ground."

"Daily"

The word "daily" should be defined to clarify the daily monitoring requirements found in the proposed regulations. (See e.g., proposed sections 2543, 2645, 2646 and 2647.) Since many facilities do not operate seven days a week, we suggest adding the following definition:

> "'Daily" means normal operating day."

Article 3

2631. Construction Standards for New Underground Storage Tanks

Most of our comments concern subsection (e), and we have a number of changes to suggest. For purposes of clarity, the term "storage facility" in the first line should be changed to "secondary container." Also, the requirement that the secondary container must be able to accommodate the volume of a 100-year storm should be changed to a 25-year storm. Health and Safety Code § 25284(a)(5), which contained the 100-year provision, was amended by Assembly Bill 3565, which was adopted this year and signed into law by the Governor. The amended section now requires the accommodation of a 25-year storm. The change in the law will go into effect at roughly the same time these regulations are adopted and should be anticipated. Lastly, we believe that the reference to subsection "(e)" should be changed to "(f)." This appears to have been a typographical error since otherwise the section refers to itself. With the changes we have suggested, subsection (e) would read as follows:

> "If the <u>secondary container</u> is open to rainfall, then the secondary container must be able to accommodate the volume of the twenty-four (24) hour-<u>twenty-five (25)</u> year storm in addition to that required in subsections (d) and <u>(f)</u> of this section."

<u>2632. Monitoring Standards for Underground Storage Tanks</u>

Subsection (e) calls for "continuous" monitoring. This is not required by the statute which states only that new underground storage tanks must

> "be designed and constructed with a monitoring system capable of detecting the entry of the hazardous material stored in the primary containment into the secondary containment. If water could intrude into the secondary containment, a means of monitoring for water intrusion and for safely removing the water shall also be provided" (Health and Safety Code § 25284(b)).

Nothing in this section mandates expensive continuous or automatic monitoring and, accordingly, this requirement should be deleted as beyond the Board's authority and as not necessary for groundwater protection. Monitoring on a periodic basis, along with inventory control, is sufficient to detect leakage from the primary container and to satisfy the requirements of Health and Safety Code § 25284(b). Any leakage which does occur would be caught by the secondary container. Periodic monitoring should be based on the requirements of the local agency as specified by the statute. (Health and Safety Code § 25284.1). Also, if sensors are used to comply, there is no need to require removal of the sensors on a semi-annual basis. We suggest that this requirement be changed to "as needed."

With regard to subsection (e)(1), we have a number of suggestions. To begin, analyzing standing liquid to "best detection limits" is not necessary. If a hazardous substance is found in the secondary containment, then the problem is to determine where it came from, regardless of the amount of the hazardous substance found. In addition, it should not be necessary to require alarm systems since these facilities can be visually monitored for small amounts of standing liquid. Accordingly, with these changes, subsection (e) would read:

> "The sump shall be monitored <u>on a periodic basis as required by the local agency. Sensors, if used, shall be calibrated and maintained as needed. The monitoring</u> shall be capable of either:
>
> "(1) Detecting within the sump 0.5 inches of standing liquid when any combination of a hazardous substance or water is present. All standing liquids shall be sampled and analyzed to determine the presence of hazardous substances. <u>This requirement does not apply when water is normally expected to be present within the secondary containment; or</u>

"(2) Detecting within the sump 0.5 inches of the hazardous substance stored in the primary container(s)."

Subsection (f) also calls for continuous monitoring and an alarm system for double-walled tanks. Continous monitoring and installation of an alarm is expensive and is unnecessary to protect the ground water. Periodic monitoring should be sufficient to determine if leaks are occurring in the interstitial space between the walls of a double-walled tank. The section should be changed as follows:

"(f) The interstitial space between the walls of a double-walled tank may be monitored <u>using a pressure sensor or other method as approved by the local agency</u>. Double-walled tanks which utilize this leak detection system are exempt from the requirements of subsections 2632(c) through (e)."

<u>2633. Construction Standards for New Motor Vehicle Fuel Tanks</u>

We suggest adding an additional sentence to subsection (b) as follows:

"<u>New underground tanks constructed with primary and secondary levels of containment including double-walled tanks which satisfy the requirements of Section 2631, shall be considered to fulfill the requirements of this subsection.</u>"

As this section is currently written, double-walled tanks do not meet the criteria specified since most such tanks are not coated. Yet, we believe it is the Board's preference that double-walled tanks be installed. The language we suggest is necessary to clarify that the installation of a double-walled tank fully satisfies the requirements of Section 2633 and exempts the owner/operator from all other requirements of this section.

Also, for the purposes of clarity a new subsection (h) should be added to state:

"<u>suction piping systems are exempt from secondary container requirements</u>."

By definition, operation of such systems provides self-testing each time the equiqment is used and assures that any leaks will be quickly detected.

<u>2634. Monitoring Standards for New Motor Vehicle Fuel Tanks</u>

Alternate construction standards are provided in Section 2633 for new tanks which contain motor vehicle fuels. If an applicant complies with this section rather than with Section 2631, then the monitoring standards specified in Section 2634 apply rather than those specified in Section 2632. The general monitoring requirements in Section 2632 do not have some of the requirements found in Section 2634, such as hydrostatic testing. The staff has indicated that double-walled tanks meeting the requirements of subsection 2631(h) should be exempted from the requirements for hydrostatic testing under Section 2634. We ask that this be clarified. We also ask that the requirement for hydrostatic testing be changed to every three years, instead of every two years, to be consistent with the inspection required by Health and Safety Code § 25283.4(a). Accordingly, we suggest amending subsection (a)(3) as follows:

"(3) <u>Except for double-walled tanks meeting the requirements of Section 2633</u>, hydrostatic testing of the tank every <u>three</u> years according to the criteria specified in Section 2642 of Article 4, and . . ."

With regard to the casing monitoring requirements in subsection (c), we believe that continuous monitoring is not necessary or authorized by the statute and should be deleted. The monitoring requirements should be flexible and consistent with the design capabilities of the system. Accordingly, we suggest the following changes:

(c) "Monitoring of each casing described in 2634(b) shall be of a type and frequency to permit the detection and clean up of materials leaking from the primary container before they reach groundwater. The determination of monitoring frequency shall be based on an evaluation which considers the following:

"1. Volume of the secondary container in relation to the volume of the primary container;

"2. The amount of time the secondary container must provide containment in relation to the period of time between detection of an unauthorized release and clean-up of the leaked materials."

With regard to subsection (d), which requires testing of underground storage tanks showing a loss or gain of a hazardous substance or water, we have several suggestions. First, using a daily loss or gain of 50 gallons to trigger the testing requirement is unrealistic, especially for very large tanks. Many petroleum storage tanks can experience daily variations in this range due to factors unrelated to product loss or tank integrity, such as temperature, gauging errors, and meter calibration. Temperature differential occurs as a result of differences between the temperature of the delivered product and the temperature of the product in the tank, as well as changes in ground temperature. Gauging errors can be due to the slope of the tank or to a lack of precise information on the exact size and shape of the tank. If testing is required when there is a

50-gallon discrepancy, this will create too many "false alarms" and unnecessary testing will result. Therefore, we suggest that a more realistic discrepancy figure be substituted, either 100 gallons, or ten percent of the daily throughput, whichever is greater.

Finally, with regard to the requirements concerning a seven-day loss or gain in subsection (d)(2), we suggest changing the word "delivered" to "throughput" to be consistent with the changes suggested to subsection (d)(1) above and existing subsection (d)(3).

2635. General Construction Standards

Subsection (b)(3) requires either hydrostatic or pressure testing of double-walled tanks. This type of testing is unnecessary for double-walled tanks because other methods of inspection of the annular space will reveal leakage. Thus, this requirement is unnecessary and should be deleted.

Subsection (c)(1) sets forth requirements as to the location of underground storage tanks in relation to existing structures. This type of concern is beyond the scope of the statute and is already adequately covered by the process of obtaining the necessary building permits. In addition, NFPA-30 adequately addresses proper location of such tanks. Therefore, CUSA believes that this subsection should be deleted.

Subsection (f) sets forth the requirements for overflow protection systems. The statute does not mandate such systems but simply says that they <u>may</u> be required. For consistency we suggest that the word "shall" should be changed to "may" in this subsection.

In addition, to be consistent with the above change and for purposes of clarity, we suggest that subsection (g) be amended as follows:

"The overflow protection system that may be required in subsection (f) of this section shall be satisfied for underground storage tanks containing motor vehicle fuels in which:

"1. Both the fluid level is visually monitored and the filling operation is controlled by the facility or delivery vehicle operator during filling of the underground storage tank, or . . ."

The additional language in subsection (g)(1) is suggested because the facility operator may not always be present during the delivery operations. As we understand it, the intent of the statute was to require that a responsible person watch the delivery operation to make sure that 1) the hose did not come loose during filling of the tank, and 2) that no over-filling occurred. Under current industry operating procedures, and as set forth in delivery contracts, vehicle drivers are totally responsible for the safe delivery of their load at the service station. This is done by visually monitoring the filling operation.

Subsection (g)(2) requires that, prior to filling, the available capacity of the tank must be determined to be at least 110 percent of the volume of the delivery vehicle's tank compartment. The 110 percent figure is unnecessarily high. We suggest the following changes:

"The available capacity of the tank to be filled is determined immediately prior to filling to be at least 103 percent of the volume of the entire tank compartment to be delivered as determined by tank gauging or the tank capacity has a minimum of 200 gallons ullage as vapor space when the tank is filled to maximum working capacity."

Article 4

As CUSA has noted in its general comments above, this article, as presently written, fails to follow the mandate of the enabling statute for UST monitoring alternatives. Instead, the proposed existing tank monitoring regulations would require a tank operator to conduct all of a series of monitoring methods that were clearly intended by the Legislature to be alternatives selected by the local agency, and not the Board. Health and Safety Code § 25284.1 provides for either visual monitoring or "alternative methods of monitoring . . . on a monthly, or more frequent basis" as "may be required by the local agency . . ."

In order to bring the proposed regulations into line with the dictates of the enabling statute, a number of structural changes to Article 4 must first take place. We propose the following:

(1) Subsection 2640(d)

As presently written, this subsection does not take into account the local agency's role in determining what should be the alternatives to insure UST monitoring. Therefore, CUSA proposes that the final sentence of this subsection be modified to read:

> "However, unless visual monitoring is implemented for the entire underground storage tank throughout the entire year, other forms of monitoring shall also be implemented as required by the local agency."

(2) Subsection 2640(e)

This section sets forth the requirement that owners of USTs who are unable to implement visual monitoring "shall implement each alternate monitoring method as specified in Sections 2642 through 2646." Subsection 2640(e) should follow the statutory scheme by requiring owners of USTs who are unable to implement visual monitoring to implement only the alternative monitoring method selected by the local agency. The alternative method may be one of the methods described in Sections 2642 through 2646.

(3) Subsection 2640(f)

CUSA suggests that a new subsection 2640(f)*/ be inserted which would make the provisions for motor vehicle fuel storage tanks parallel to the provisions in subsection 2640(e) as outlined above. Thus, new subsection 2640(f) would follow Health and Safety Code statutory language in § 25284.1(b)(3). It would provide that owners of motor vehicle fuel storage tank systems would be able to monitor those systems through daily gauging, inventory control, tank testing, and leak detection devices.

(4) Sections 2642-2646

Each of these sections begins with a subsection (a) which requires all owners of existing USTs to comply with their requirements. These subsections (a) should be replaced with language such as the following:

"(a) Any owner of an existing underground storage tank, who is required by the local agency to implement a [testing, inventory control, evaluation, vadose zone detection monitoring, or ground water leak detection] program shall comply with subsections (c) through (g) [or, the final subsection if different from '(g)] of this section, unless the owner meets the requirements in subsection (b)."

*/ For consistency, existing subsections 2640(f)-(i) should be re-lettered.

Sections 2642-2646 each contain a subsection (b) which sets forth grounds which would exempt the owner from some or all of the requirements of those sections. CUSA believes that these exemptions should remain but that the local agency should have the discretion to determine whether a specific owner or operator should be exempted from any monitoring alternative chosen by the local agency. This change is supported by the language in Health and Safety Code § 25284.1(b)(2) which specifically gives the local agency discretion regarding implementation of any monitoring alternative.

Thus, these subsections (b) should be re-drafted to set forth the specific requirements which would have to be met to be exempt from the specific monitoring method. For example, subsection (b) of Section 2642 would read:

> "(b) Owners of existing underground storage tanks <u>shall not be required to implement a testing program</u> if they can demonstrate to the local agency that at least one of the following conditions applies:
>
> "(1) Visual monitoring pursuant to Section 2641 of this article <u>has been</u> implemented.
>
> "(2) Any test which meets the conditions described in subsection (c) of this section cannot be performed without significant excavation."

(4) <u>Section 2646</u>

The enabling statute, Health and Safety Code § 25284.1(b) states that the local agency shall approve the location and number of wells, the depth of wells and the sampling frequency. Nevertheless, Section 2646 of the regulations specifies location and number of wells, their depth, and their sampling frequency.

This is clearly in excess of the Board's authority as defined in the OAL Standards. The regulations have all but ignored the role of the local agency as spelled out in the statute. We ask that the Board amend Section 2646 to conform to the statute by giving the required discretion to the local agency.

Comments on Specific Sections

2640. Applicability

(1) 2640(a)-(b)

These subsection sets forth the basic standards and objectives of the monitoring program for USTs. CUSA believes that two of the monitoring objectives are inconsistent with the statutory authority of the Board: (1) to detect unauthorized past releases and (2) "to directly measure the quality of the ground water." The enabling statute requires that a monitoring system shall be "capable of detecting unauthorized releases of any hazardous substances stored in the facility." As stated in our general comments, nothing is said of past releases. Also, in order to detect unauthorized releases of hazardous substances, a monitoring system need not measure the quality of the ground water. Unless information regarding past contamination is needed to detect current or future leaks, monitoring for past contamination is not necessary to achieve the aims of the statute and therefore should not be required in these regulations. Leak detection systems such as inventory control/reconciliation, tank testing, soil sampling or vadose zone monitoring are sufficient to detect any unauthorized releases. Once such a release is discovered, groundwater quality data may be required by the Regional Water Quality Control Board under the

Porter-Cologne Water Quality Act. Thus, these regulations are not the proper forum to address this issue.

In fact, in some circumstances, a groundwater quality monitoring well shaft could become a conduit for hazardous substances to travel from soil to ground water. Until it is determined that hazardous substances have leaked out of the primary and secondary containment structures, no groundwater quality monitoring should be required. It makes no sense to require such monitoring for <u>all</u> UST facilities. We ask that these references be deleted in both subsections (a) and (b).

(2) <u>2640(c)</u>

This subsection requires that, if feasible, the initial monitoring of all existing USTs shall be capable of determining whether prior use of the UST has resulted in an unauthorized past release. As CUSA has noted above, the enabling statute only provides for monitoring systems "capable of detecting unauthorized releases." Health and Safety Code § 25284.1. Thus, subsection 2640(c) should be deleted as being beyond the authority granted to the Board.

(3) <u>2640(h)</u>

Subsection 2640(h) now reads: "All borings and wells constructed and sampled pursuant to this article shall utilize the construction and sampling methods specified in Section 2648 of this article." With regard to sampling, the only reference to sampling techniques in Section 2648 is the requirement that: "The sampling equipment . . . shall be compatible with the stored product and shall not donate, capture, mask nor alter product constituents for which analysis can be made." § 2648(a). This requirement seems to be something short of a "sampling method," and we would propose that the Board delete the reference in subsection 2640(h) to "sampling methods."

2641. Visual Monitoring

(1) 2641(b)

Subsection 2641(b) provides that the owner of a UST "is exempted" from the visual monitoring requirements if any one of four conditions is met. CUSA suggests that this language be changed to allow an owner the opportunity to conduct visual monitoring even if one of the listed conditions exists. Then the choice whether or not to be exempted would clearly be the owner's. The current language, "is exempted," could be interpreted to mean that if one of the listed conditions exists then the owner cannot engage in visual monitoring. We suggest that language be changed to "has the option of being exempted" and thereby ensure that the owner can make the determination.

(2) 2641(c)(3)

This subsection requires visual monitoring on a "daily" basis. As noted elsewhere in the comments, "daily" should be defined, possibly in terms of normal operating days. CUSA suggests, as an alternative, that the Board leave the frequency of visual inspections up to the local agency. This would allow the flexibility in compliance which is necessary given the tremendous range of types of USTs and operating conditions covered by these regulations. It may be impractical or unnecessary to visually inspect every tank on a daily basis. For example, some tanks will have a leak detection system which will make daily visual inspections redundant.

(3) 2641(c)(4)

As part of the visual monitoring program, this subsection requires "[r]ecordation and reporting of the liquid level in the tank at the time of inspection." We see no reason why liquid levels should be reported on a daily basis. Local agencies administering the regulations are unlikely to be able to process or utilize daily liquid level information. We believe that recording the level and making such information available to the administering agency upon request should be sufficient.

2642. Underground Storage Tank Testing

(1) 2642(b)

A third exemption from the tank testing alternative in Section 2642 should be recognized. Those tanks that are subject to §§ 2645-2647, the monitoring requirements, should not also be required to tank test. The monitoring requirements in §§2645-2647 are significantly more stringent than the tank testing requirements and should identify a leak from an underground storage tank sooner than it would be identified under the tank testing method. Thus, the owner or operator should not be required to tank test in addition to monitoring.

(2) 2642(c)

Subsection 2642(c) requires that any tank testing method used shall be limited to those methods which make adjustments for a number of factors listed in that subsection. CUSA suggests that in addition to test methods which make the required adjustments, the Board should also allow the use of any test method which conforms to National Fire Protection Association ("NFPA") standards. Those standards are in an NFPA publication entitled "Underground Leakage of Flammable and Combustible Liquids," (1983) at Sections 4-3.6 and 4-3.7. The NFPA standards are nationally recognized tank-testing methods and many owners and operators of USTs are already familiar with those testing procedures.

(3) 2642(d)

This subsection establishes the frequency of testing USTs. Category B requires testing of all corrosion resistant tanks within one year of permit issuance and yearly beginning fifteen years after installation. Corrosion resistant tanks include: fiberglass reinforced plastic ("FRP"), cathodically protected steel, and FRP-clad steel tanks. Unlike the two other corrosion resistant tanks, FRP tanks typically have a thirty-year warranty. CUSA suggests that an appropriate time to begin testing FRP tanks would be twenty-five years after installation instead of fifteen. Thus, we seek a change in Category B which would require a test for FRP "within one year of permit issuance and yearly beginning twenty-five (25) years after tank installation." For all other corrosion resistant tanks, the fifteen year interval would remain as it is in the current draft.

(4) 2642(h)

Subsection 2642(h) requires that pressurized portions of underground storage tanks "shall be monitored utilizing an on-line pressure loss detector and flow reduction device." The detector is to be connected to a visual or audible alarm system. The Board should make this subsection consistent with the requirements in subsection 2633(f) (construction standards for new motor vehicle fuel storage tanks) which also pertain to pressurized portions of underground storage tanks. In subsection 2633(f), the detector is not required to be connected to a visual or audible alarm system if the flow restriction device provides at least a 50 percent reduction from normal flow rates.

There is simply no support for requiring a detector to be connected to a visual or audible alarm system and a flow restriction device for purposes of tank testing under subsection 2642(h) while at the same time allowing the detector to be connected to either a visual or audible alarm systm or a flow restriction device for motor vehicle fuel tanks. The owner of the tank should have the option of using the alarm or flow restriction device in all cases.

2643. Inventory Control

(1) 2643(a)-(b) and d(3)

These subsections impose inventory control requirements on "owners" of existing USTs. CUSA asks that the Board specify "operators" instead of owners since the operator will generally be the person responsible for daily activities associated with the tank, including inventory control. In addition, Health and Safety Code § 25284.1(b)(3), as amended by A.B. 3781, specifies that "operators," not owners, shall be the persons responsible for inventory control for motor vehicle fuel underground storage tanks.

(2) 2643(c)

CUSA's concerns with this subsection have been addressed in more detail elsewhere, but for completeness will be summarized here. "Daily" inventory control only makes sense if "daily" is defined to mean operating days.

(3) 2643(d)

This subsection requires that meters used for daily inventory control "shall be approved for use by the County Department of Weights and Measures." CUSA suggests that the Board add to that sentence: "or shall be approved by a person licensed by the County Department of Weights and Measures." This addition would make it clear that those individuals licensed by the County to approve such meters would also be available to approve meters in addition to County personnel.

(4) 2643(e)

This subsection requires verification of wholesale meter delivery records according to the procedure outlined. For a large percentage of the USTs covered by these regulations this verification procedure will not be effective. For example, at retail gasoline stations, the only way to verify metered deliveries is through the use of a stick to measure the depth of fuel in the tank. The reading on the stick can be converted to fuel volume using a table prepared for each particular tank. While a stick can be a very effective means to detect a trend over a period of time, it is inherently less accurate than the meter, approved by the local County Department of Weights and Measures, used in a delivery vehicle. Thus, it makes no sense to require verification of the meter by use of a less accurate method of measurement.

If the Board should decide to leave this subsection in the regulations, then, at the very least, it should amend the quantities which trigger a re-evaluation. As just noted, inaccuracies in stick measurements make the current threshold quantities of "the lessor (sic) of one-half percent of the delivery volume or 50 gallons" too low. At these levels, re-evaluations will be required for the wrong reasons on a frequent basis.

Therefore, CUSA suggests that the Board adopt the following language to replace the first sentence in subsection 2643(e)(4):

"A difference of the greater of 5 percent of the daily throughput delivered to the tank or 100 gallons shall be the cause for a re-evaluation of the measurements."

(5) 2643(f)

CUSA believes, as it has stated above, that stick measuring is far from an exact science. Reliance on it to detect tank leakage will result in far too many false alarms. Therefore, CUSA suggests that the Board make the following changes to subsections 2 and 3:

(1) "Daily loss or gain of 100 gallons or 10% of throughput, or"

(2) "Seven (7) day loss or gain of five percent of the throughput of motor vehicle fuel delivered over the seven days, or

(3) "Cumulative (calculated over a period of at least thirty (30) days) loss or gain of one-half percent of the volume of motor vehicle fuel throughput over the period that cumulative gain or loss is calculated."

Introduction to Sections 2644-2647

The following comments raise questions and suggest changes to these sections based upon their applicability to motor vehicle fuel storage tanks. By the staff's own estimate, these tanks comprise over two-thirds of all the tanks that will be covered by these regulations. Yet, because of the nature of the substance stored in these tanks, many of the requirements of these sections are simply too stringent. The problem is that the petroleum products in the motor vehicle fuel storage tanks have specific, known properties which make some of the requirements in the following sections unnecessary.

For example, petroleum products have a viscosity similar to water and a volatility higher than water. They will therefore migrate through the unsaturated zone at approximately the same rate as water, yet they will readily vaporize. Since most petroleum products are immiscible, of low solubility in water and have a density less than water, they will float on the surface of ground water.

These properties are well-known, and established monitoring techniques have been developed which make use of these properties. Our comments suggest changes to Sections 2644-2647 which we believe make sense for tanks holding petroleum products.

<u>2644. Soil Testing and Exploratory Boring</u>

(1) <u>2644(c)</u>

This subsection requires all owners of existing USTs to drill slant borings for soil testing. This requirement, in addition to being beyond the Board's authority pursuant to the Health & Safety Code, makes little practical or technical sense. The requirement for slant boring is apparently based on the assumption that discharges from a leaking underground storage tank migrate vertically downward, with little lateral migration. Thus, presumably, slant borings would reveal the presence of leaked substance directly beneath the tank.

However, the instance of a leaked substance migrating through the unsaturated zone with little or no lateral migration would be extremely rare. Practically all unconsolidated and semi-consolidated materials are deposited in nearly horizontal layers. As a result, preferential permeability pathways are established in the direction of least resistance. Any layer of finer-grained material deposited in a coarse-grained zone, such as a sandy layer within a gravel zone, or a clay-rich layer within a medium sand layer, will enhance the likelihood of lateral migration in the unsaturated zone.

The evidence gathered from past subsurface spill investigations supports the contention that fluids in the unsaturated zone migrate both vertically and laterally. Thus, the assumption that leaked liquids migrate only vertically is demonstrably false in the vast majority of instances, and the requirement for slant borings unnecessary.

CUSA therefore recommends that this subsection be deleted from the proposed regulations as being both beyond the Board's statutory authorization and as unnecessary.

(2) 2644(e)(4)

This subsection would require that a registered civil engineer or geologist or a certified engineering geologist competent in soils engineering, log and describe soils removed from a boring. Based upon field experience, CUSA believes that such a requirement is unnecessary. The identification of soil samples is effectively being performed in the field by non-registered engineers, geologists, soil scientists and other professionals on a daily basis. As a practical matter, registered civil engineers, geologists or certified engineering geologists are rarely involved with such day-to-day field work. As presently written, subsection 2644(e)(4) would exclude from such field work those persons who are actively involved and may be better qualified.

CUSA proposes the subsection provide that the logging of borings and description of soils be undertaken under the supervision of registered or certified personnel. It proposes the following changes to subsection 2644(e)(4):

> "All borings shall be logged in detail and the soils described according to the Unified Soils Classification System <u>under the supervision</u> of a registered civil engineer or a registered geologist competent in soils engineering."

<u>2645. Vadose Zone Detection Monitoring</u>

(1) <u>2645(b)</u>

This subsection provides a series of exemptions from the requirement for vadose zone monitoring of USTs. CUSA believes that a further exemption should be granted for tanks that contain immiscible, low-density (i.e., less than water) fluids.

Vadose zone monitoring systems of whatever type are complex and are largely an unproven indicator of storage tank leakage. In addition, vandose zone monitoring is ineffective at shallow groundwater conditions (i.e., less that 5 feet below the tank invert). Groundwater monitoring in groundwater depths of less than 40 feet is a proven and successful method of detecting such leaks when the leaked fluid is of a low density, such as hydrocarbons. The presence of such fluids on the ground water is readily apparent by visual inspection of the sampled water.

Therefore, CUSA proposes the addition of subsection 2645(b)(5) to read as follows:

"<u>The tank contains only fluids which are immiscible in water and which have a density less than water, and the depth to ground water is less than 5 feet below the tank invert</u>."

(2) <u>Section 2645(e)</u>

As CUSA has noted above, the local agency is the agency best suited to determine the proper location of monitoring systems because it is most familiar with the particular geological and hydrogeological conditions in its area. Therefore, CUSA suggests that subsection 2645(e) be rewritten as follows:

"Subsurface systems shall be located <u>as required by the local agency</u>."

(3) <u>2645(f)(1)</u>

CUSA agrees that some provision should be made to demonstrate the reliability of vapor monitoring methods. However, as this subsection is currently written, it provides for testing on a site-by-site basis, even where identical tanks containing the same or similar products and employing identical monitoring systems may be in place at numerous other locations. CUSA proposes that this section be rewritten to provide for a single demonstration of a vapor monitoring system for multiple-tank installations where a common product is stored and a similar backfill material is used.

Therefore, CUSA proposes the following changes to subsection 2645(f)(1):

"Vapor monitoring for underground storage tanks may be used in accordance with the following criteria if the vapor characteristics of the stored product are susceptible to detection:

"Before any method of vapor monitoring is approved for a specific site, <u>or for multiple sites (defined as tanks containing similar types of product situated in similar backfill material)</u> it shall be demonstrated by an actual on site demonstration, <u>or in the case of multiple sites, at a single location chosen by the local agency at random</u>, using an appropriate tracer substance, that vapor could actually be detected by the installed system.

(4) <u>2645(h)</u>

This subsection requires the tank operator to conduct continuous vadose zone monitoring, if feasible. Based upon the known operational history, the reliability of continuously operating vadose monitoring systems has not been established. Until it can be shown that continuous operation is feasible, continuous monitoring should not be required.

The requirement that monitoring, if not performed continuously, should be performed weekly, is similarly unnecessary. For example, operators of motor vehicle fuel tanks will be required to take daily inventory measurements that would show any major loss of product well before vadose zone monitoring would reveal it. If the loss of product is minor, vadose monitoring should be as effective in detecting a leak. CUSA therefore recommends that this section be deleted from the proposed regulations as unnecessary. At the very least, service stations and other businesses which must conduct daily inventory control should be exempt from weekly monitoring requirements.

2646. Ground Water Leak Detection Monitoring

(1) 2646(c) and (d)

These subsections will be discussed together because they present similar problems. As stated above, the enabling statute for these regulations does not authorize the Board to require both vadose and groundwater monitoring. Further, conducting both vadose zone and groundwater monitoring is unnecessary where ground water is near the ground surface. In such situations, groundwater monitoring will in most cases be the most effective and dependable method for leak monitoring because it is simpler and has a proven operational record. Moreover, if the ground water is located near the base of the tank, vadose monitoring would not reveal a tank leak prior to groundwater impact.

Because both existing sections improperly and unnecessarily provide for both vadose and groundwater monitoring, CUSA proposes that they be eliminated from the regulations.

(2) 2646(e)(1)

As CUSA has noted earlier, the enabling statute provides that the local agency is the proper body to determine the location and number of monitoring wells. We therefore stress again that this subsection should be modified to conform to the statute. However, there are also technical problems with the subsection as written. It appears to assume that for any given tank location, there is no information available concerning the direction and rate of groundwater movement or its depth. In actual practice, direct and supportive evidence exists to show the general direction, flow rate and depth of ground water at many sites. In such situtations, an equal distribution of monitor wells around the entire tank perimeter is unnecessary to effectively monitor the storage facility. Fewer wells, situated on the downgradient side of the storage facility would provide effective monitoring data.

While a maximum radial distance between monitor wells of 30 feet may be appropriate for certain substances, for hydrocarbons this limit is too conservative. When free hydrocarbons come in contact with ground water the water is temporarily depressed by the hydrocarbons. The extent of the water table depresssion is contingent upon the rate of loading, the type of product, and the permeability of the sediments. After this initial water table depression, the product migrates laterally in all directions until a point at which the water gradient begins to dominate the flow regime of the two fluids. Generally, for equal quantities of lost product, a slow rate of loading will result in a thin layer of product spread over a relatively large area. Conversely, a rapid rate of hydrocarbon loading results in a thicker accumulation of product with less lateral spreading.

Daily inventory control would detect the loss of product that would be associated with a rapid rate of product loading long before the leakage was discovered by the groundwater wells. Therefore, the only situation for concern is that where a slow rate of loss is occurring. Given the wide lateral spreading associated with hydrocarbons on the water surface, a well spacing of 40 to 45 feet would provide a monitoring network as effective as the proposed 30 foot well spacing.

Thus, CUSA suggests that the second sentence of subsection 2646(e)(1) be amended as follows:

"Additional borings shall be installed at closer regular spacings if the straight line distance between wells exceeds 30 feet, <u>or, if the tank contains hydrocarbons or is subject to daily inventory control, if the straight line distance between wells exceeds 40 feet</u>."

(3) <u>2646(e)(3)</u>

The requirement in this subsection for four-inch diameter casings is an unnecessary one. Groundwater monitor wells must be of sufficient diameter to allow for the easy withdrawal of groundwater samples. Ground water samplers are commercially available in many sizes ranging from less than an inch to over several feet in diameter.

CUSA proposes that two-inch minimum inside-diameter casing be required for groundwater monitor wells. Both two-inch and four-inch diameter wells will detect the presence of contaminants. Moreover, the four-inch diameter well will, in many instances, be more difficult to properly install. A two-inch diameter well can be simply installed and the proper placement of a gravel pack for each well can be better assured with the use of two-inch diameter casing. Installing four-inch and larger wells would require excessively large diameter augers, with attendant operational problems.

(4) <u>2646(e)(4)</u>

This subsection, requiring a minimum surface seal around a well casing, recognizes that such seals are needed to reduce the potential of surface leakage along well bore and the native material. However, when the depth to ground water is very shallow (less than five feet below grade), the surface seal is less critical because other avenues for surface infiltration are readily available. In such situations, a surface seal of at least the thickness of the surrounding pavement, or if none exists, 6 inches will provide adequate protection from surface infiltration. Moreover, if the requirement for a minimum surface seal is relaxed in this manner, the perforated interval of the well casing may be extended above the air-water interface. With a properly designed monitor well network, the groundwater surface can then be visually monitored for the presence of such substances as free hydrocarbons.

Therefore, CUSA proposes the following changes for this subsection:

> "All wells should be provided with the minimum surface seal necessary to prevent infiltration of surface water. <u>In wells where the depth to groundwater is greater than 5 feet, the seal shall extend to a depth of at least 5 feet. Where the depth to groundwater is less than 5 feet, the surface seal shall be at least the thickness of the surrounding pavement or 6 inches, whichever is greater</u>."

(5) <u>2646(e)(5)</u>

This subsection, which would require pumps to draw down groundwater level 10 feet below the base of the surface seal, is both unnecessary and potentially counterproductive.

If, as CUSA suggests in its comments to subsection 2646(e)(4), the depth of the surface seal is reduced in cases where the depth to ground water is less than five feet, no in-situ pumps will be necessary if the perforated interval of the well casing is extended to span the water table. As explained above, reducing the surface seal to the thickness of the surrounding pavement or to a depth of 6 inches, and then ensuring that the perforated interval spans the entire water table, can ensure that the water in the well is representative of the entire water-bearing zone.

Requiring a pump capable of drawing down the groundwater level 10 feet below the base of the surface seal may not provide an accurate sampling of the ground water. At many locations, wells would be completed in a highly permeable water-bearing zone. In such zones, high pumping rates will be required to maintain the 10-foot drawdown below the top of the perforated interval. It is conceivable that a drawdown of 10 feet in the well may correspond to only a few inches of drawdown in the native material.

Moreover, before any discharge of ground water by a pump associated with a monitor well, permits would most likely be required by city, county, water district or sewer treatment facility authorities. The time required to seek and obtain these permits could cause major delays in identifying leakage from a storage tank. In fact, the permits may not be issued due to disputes over the water rights at the site.

In light of these concerns, CUSA believes that this subsection should be deleted as unnecessary and potentially counterproductive to the goal of early and effective leak detection.

(6) 2646(e)(6)

As presently written, this subsection calls for the construction of monitor wells without any regard for the presence of a perennial perched water table or a confining aquitard. Drilling a monitor well to a level of at least ten feet below the tank invert, and then perforating the well along its entire length, could provide a means for leaked material to migrate through the well and into the ground water.

CUSA believes that in cases where a competent aquitard and a perched water zone underlay the site of the proposed monitor well, the well should end at the perched water and should not puncture the aquitard. As a matter of common sense, if the tank is leaking, product will show up in the perched water before it migrates to the ground water below. Similarly, if a competent aquitard underlays the regional water table, the well should extend only to that level so as to not puncture the aquitard. CUSA therefore suggests the following new language for subsection 2646(e)(6):

> "In the absence of any competent aquitard or perennial perched ground water zone underneath the tank, the ground water monitor well shall extend to an elevation that is at least 10 feet below the tank invert or to the ground water-air interface, whichever is the lessor (sic) In the event a competent aquitard or perched ground water underlays the tank, the ground water monitor well shall extend only to that aquitard or perennial perched water zone. In no event should the ground water monitor well puncture a competent aquitard underlying the regional water table. The well shall be perforated at the air-water interface of the perched water or the ground water and at points above and below if necessary to account for any seasonal or other fluctuation of ground water levels."

(7) 2646(f)

The requirement in this subsection for weekly monitoring of ground water is unnecessary. In general, groundwater flow rates are less than 100 feet per year through unconsolidated fine-to-medium-grained materials. Thus, on a monthly basis, the flow rate is less than 10 feet. Furthermore, many substances, including free hydrocarbons, move on the water surface at a much slower rate than the underlying ground water.

Thus, taking the 100-feet-per-year flow rate as typical, substances in that water will have moved, at most, only a few feet during a one-month period. As previously discussed, free hydrocarbons will spread on the water surface radially away from the source of the leak. Therefore, the span of time in which the product will be clearly visible in the ground water monitor well may be months or years. No real advantage is gained by requiring weekly testing. In those cases where the substance in the tank, the character of the underlying strata, and the actual groundwater flow rate justify more frequent sampling, it could be required by the local agency.

Therefore, CUSA proposes the following changes in subsection 2646(f):

> "Ground water shall be monitored at least once per <u>month</u> from each well. More frequent monitoring may be required by the local agency <u>if it finds more frequent monitoring is justified by the type of substance stored in a given tank, the character of the underlying strata, and the rate of groundwater flow beneath the tank</u>. Sampling and analysis, if applicable, shall be according to Section 2648 of this article."

<u>2747. Assurance Ground Water Monitoring</u>

(2) <u>2647(b)(2)</u>

This subsection exempts tank owners from implementing an assurance groundwater monitoring system if they can demonstrate that the highest groundwater level expected during the life of the UST is greater than 200 feet in depth. CUSA believes that the 200-foot figure is too deep to require the construction of groundwater wells, because wells completed to these excessive depths would be ineffective in rapidly detecting a leak, and may in turn cause cross-contamination.

A large body of evidence suggests that the monitoring of ground water at depths greater than 30 feet below the tank invert is an ineffective method for early leak detection. At such depths, the lag between initial product leakage and the first appearances of the product at the groundwater monitoring point may be months or years, depending on the character of the underlying sediment, the type of product stored and the rate of leakage. Moreover, standard drilling practices, such as augering, are ineffective and impractical at excessive depths. Actual depth limitations are dependent upon the drill rig used and the cohesiveness, degree of consolidation, and grain size of underlying sediments. Often, these limiting factors are not known until the drill stem has been abandoned in place due to lack of sufficient torque and lifting capacity from the drill rig. The risk of such drill stem loss increases dramatically at increasing depths.

Thus, if the intention of subsection 2647(b)(2) is to exempt tank owners from installing ineffective groundwater monitor wells, CUSA suggests that the better approach would be to exempt the construction of such wells if the highest groundwater level possible is expected to be deeper than 30 feet below the tank invert.

(2) <u>2647(f)(3)</u>

This subsection would exempt the drilling of groundwater monitor wells when physical obstacles prevent the positioning and operation of drilling equipment within 500 feet of a tank or tank cluster perimeter. CUSA proposes that in addition to this limitation, tank owners should be exempted if they cannot drill the wells on their own property. As a practical matter, adjoining property owners are highly unlikely to allow the disruptions attendant to the drilling of wells and the regular sampling of ground water. Therefore, CUSA proposes the addition of the following subsection 2647(b)(5):

> "Proximity to physical obstacles prevents the positioning and operation of drilling equipment on the property of the tank owner."

"(3) 2647(c)(1)

CUSA believes that this subsection, which mandates the installation of groundwater monitoring systems where the groundwater depth is between 5 feet below the tank invert and 100 feet below the ground surface, should be deleted because it fails both to reflect the dictates of the enabling statute for these regulations and to provide for effective UST monitoring.

First, as explained earlier in these comments, the local agency, and not the Board, is the body mandated by the Legislature to determine which monitoring system shall be used in a given case. Health and Safety Code § 25284.1(b). As noted above, groundwater monitoring is an alternative monitoring method only and the enabling statute does not require it for all existing tanks.

Second, as also explained above, groundwater monitoring at depths greater than 30 feet below the tank invert is generally not the most effective method for early detection of product leakage. (See comment on subsection 2647(b)(2) above.)

Thus, CUSA suggests that this subsection be deleted from the proposed regulations.

(4) 2647(c)(2)

CUSA's comments on this subsection are similar to those with respect to subsection 2647(c)(1). Where the highest anticipated ground water is at a depth greater than 100 feet, groundwater monitor well placement is generally ill-advised, both because of the difficulty of installation and the greater potential lag time between leakage and discovery. CUSA submits that this section is neither required by the statute nor advisable on technical grounds, and should therefore be deleted.

(5) 2647(d)

This subsection appears to assume that a determination of the depth to ground water in any given area cannot be established save through existing well data or the drilling of an exploratory boring. However, a trained professional should be able to determine with the desired accuracy the expected depth to ground water based on the location and density of water wells in the area, the regional geology and topography, and the proximity of streams, lakes and vegetation cover.

If it is decided that groundwater wells are not a desired monitoring method for groundwater depths greater than 30 feet below the tank invert, the importance of establishing whether ground water is at greater depths is unimportant.

CUSA therefore suggests the following new subsection 2647(d):

"<u>To establish accurately the depth of ground water under an underground storage tank facility, local agencies shall require documentation of the groundwater elevation</u>

utilizing existing wells within 500 feet of the facility, or as demonstrated by a certified professional. If an exploratory boring is constructed to determine ground water depths, it shall be constructed as follows:"

(6) 2647(d)(1)

As presently written, this subsection does not adequately define what is a "large area" for the purpose of drilling multiple exploratory wells. A more accurate definition would take ito account the area described on the surface of the USTs. CUSA suggests the following changes in this subsection:

"An exploratory boring shall be drilled in the anticipated downgradient direction from the underground storage tank. More than one exploratory boring may be required where geohydrological conditions are complex or where the surface area above the underground storage tank at a facility exceeds two acres."

(7) 2647(d)(5)

As CUSA has commented above, groundwater monitoring is not a feasible or desirable early leak detection alternative when the groundwater depth exceeds 30 feet below the tank invert. Thus, this subsection, which calls for exploratory borings to be drilled to a minimum depth of 200 feet if ground water is not encountered at that depth, is unnecessary. CUSA recommends that this subsection be amended as follows:

"The exploratory boring shall be drilled to a depth of 30 feet below the tank invert if ground water is not encountered at a depth of less than 30 feet below the tank invert."

(8) 2647(d)(6)(A)

As CUSA has discussed, groundwater monitoring should not be required where the depth to ground water is greater than 30 feet below the tank invert. In addition, as CUSA has also previously noted, 2-inch diameter casing is sufficient for monitor wells with regard both to efficiency and ease of installation. Thus, CUSA proposes that this subsection be modified to require an exploratory boring to be converted to a groundwater monitor well if ground water is encountered within 30 feet below the tank invert, and to allow the use of 2-inch ID casing for a well conversion.

(9) 2647(d)(6)(B)

This subsection, which establishes both the depth and degree of perforation of exploratory wells, does not currently account for the presence of competent aquitards underlying a tank. As CUSA has commented previously, placing a well through a competent aquitard and perforating the well through essentially its entire length, could result in the vertical communication of fluid between distinct water-bearing zones. Shallow contamination could short-circuit the detection system and contaminate deeper water-bearing zones. Thus, CUSA recommends that this subsection be rewritten to provide for perforation of the exploratory well only from some point above the air-water interface (to allow for seasonal groundwater variations) to a point either 10 feet below the historical low groundwater level or to the top of a competent aquitard.

(10) 2647(d)(6)(C)

This subsection, calling for groundwater monitoring of a confined aquifer, is unnecessary and counterproductive with respect to wells for tanks containing hydrocarbons. In the case of a truly confined aquifer, hydrocarbons will be detected on the perched zone above the uppermost confining aquitard. The overlying perched water zone above this aquitard or the vadose zone immediately adjacent to the tanks should be the area for monitoring.

Thus, CUSA proposes that the following sentence be added to this section:

"<u>This section does not apply to monitoring systems installed for tanks containing hydrocarbon products</u>."

(11) <u>2647(d)(7)</u>

As previously discussed, no exploratory boring should be required at depths below 30 feet below the tank invert. Thus, this subsection should be amended to require backfilling and sealing of exploratory wells if the boring does not reveal ground water within a depth of 30 feet below the tank invert.

(12) <u>2647(e)</u>

While this subsection recognizes that well samples should represent the ground water being tested, it fails to provide an adequate methodology to attain this end. For example, when salt-water is present, groundwater pH, specific conductivity or temperature may not stabilize during pre-collection pumping. Therefore, it is reasonable to note possible variations in these chemical parameters during pumping.

If the intended purpose of this section is to ensure that representative groundwater samples are used, CUSA suggests that the better method would be to follow the U.S. Environmental Protection Agency's practice of pumping from 4 to 10 well volumes before sampling is conducted.

The procedures and methods of groundwater sampling are extensively discussed in Fenn, et al., (1977), Scalf, et al., (1982), and Geo Trans, Inc., (1983, Draft).2/ We suggest the following changes in this subsection:

> "Wells should be sampled semi-annually at a minimum. More frequent sampling may be required by the local agency. Samples shall be taken after sufficient volumes of water have been removed from the well pursuant to the procedures set forth in Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, DOCUMENT SW-611, pp. 20-21 (Environmental Protection Agency), 1977). Sampling equipment shall not donate, capture, mask or alter the sample constituents.

2648. Well Construction and Sampling Methods

(1) 2648(a)

While CUSA agrees that sampling equipment and materials must not affect the results of the sampling, this subsection, as presently worded, could prohibit the use of excellent and perfectly acceptable materials. Recent research indicates that certain well casing materials such as polyvinyl chloride ("PVC"), polyethylene ("PE"), and polypropylene ("PP)

2/ Fenn, D., E. Cocozza, S. Isbister, O. Braids, B. Yare, and P. Roux, 11977, Procedures manual for groundwater monitoring at solid waste disposal facilities, EPA/530/SW-611, U. S. Environmental Protection Agency, Cincinnati;

Scalf, M. R., S. F. McNabb, W. I. Dunlao, R. L. Cosby, and I. Frybenber, 1981, Manual of Ground-Water Quality Sampling Procedures, NWWA/EPA Series Robert S. Kerr Environmental Research Lab., U.S. Environmental Protection Agency, Ada, Ok.

Geo.Trans, Inc., 1983, RCRA Permit Writer's Manual Ground-Water Protection (Draft) - 40 CFR Part 264, Subpart F, U. S. Environmental Protection Agency Under Contract No. 68-01-6444.

and may emit or absorb very low levels of certain organic compounds and trace metals. These emitted or absorbed compounds would not affect groundwater samples to the point of masking possible groundwater contamination. If hydrocarbons are present on the groundwater surface, the miniscule effects attributable to the casing materials would not interfere with the analysis of the ground water for the constituents stored in the tanks. Therefore, this subsection should include a sentence allowing the use of PVC, PE, and PP casing for monitor wells at hydrocarbon storage facilities.

(2) <u>2648(c)</u>

As presently worded, this subsection would force unnecessary equipment cleanings. For example, if drilling equipment is washed after its use at one location and then the same equipment is used 15 minutes later at another site, it would have to be washed yet again under the present wording of this section. A simple requirement that the equipment be washed immediately <u>before</u> a boring is started would encompass all situations and would effectively prevent cross-contamination between borings at storage facilities.

(3) <u>2648(g)</u>

This subsection is unnecessary to ensure proper groundwater monitoring because the processes used in manufacturing or processing all materials eliminate or reduce to negligible amounts any volatile compounds. Thus, CUSA suggests that a sentence be added to this section reading:

> "<u>This section is not applicable to wells for tanks containing hydrocarbons</u>."

Article 5

2650. Applicability

In subsection (d), the word "immediate" is vague and should be deleted.

2651. Unauthorized Release Requiring Recording

In subsection (a), a recordable release is defined, among other things, as an unauthorized release that is contained by the secondary container. Accordingly, in subsection (b), the words "shall be contained" should be deleted as redundant. Also, in subsection (b), the requirement to provide information on the cost of clean-up should be deleted. This information is not required by the statute and is irrelevant. Subsection (b)(3) should be deleted because this information is routinely sent to the Department of Health Services, as is a copy of the hazardous waste manifest. To require that this information also be provided to the Board exceeds the Board's authority, is unnecessary and only increases the already substantial paperwork requirements which are especially difficult for small businesses.

2652. Unauthorized Release Requiring Immediate Reporting

The word "immediate" in the section heading is vague and should be deleted. Subsection (a)(1)(B) requires that an unauthorized release is reportable if the hazard of fire or explosion is increased. This requirement exceeds the Board's authority under the statute to protect groundwater quality and should be deleted. In subsection (b), unauthorized releases set forth in (a) must be reported within 24 hours after the release has been detected or "should have been detected." This requirement is meaningless because one cannot report an undetected release. Also, the requirements to provide information regarding the cost of clean-up method and location of disposal and to provide copies of manifests should be deleted for the reasons stated in our comments on Section 2651.

Article 6

2661. Repair Evaluation

For purposes of clarity, subsections (c)(1) through (3) should be deleted and subsection (c) should be changed to read:

"If interior lining is the proposed repair method, the suitable criteria described in API Recommended Practice 1641 must be met.

This would conform to the approach taken in subsection 2662(b).

2663. Primary Container Monitoring

In subsection (a), reference is made to the Flammable and Combustible Liquids Code adopted by the National Fire Protection Association specifically NFPA 30-1981. This code was reratified in 1984 as NFPA 30-A. We suggest that subsection (a) be revised to reference NEPA 30-A. The same comment also applies to subsection (b).

Article 7

2670. Applicability

In subsection (e), the word "waste" in the first line should be substituted with the words "hazardous materials." This appears to have been an error. With regard to subsection (f), we suggest deleting the requirement that 45 days prior to the cessation of storage of hazardous materials a proposal be submitted describing how the owner intends to comply with the closure requirements. It is not necessary to provide notice this far in advance. We suggest not specifying a set time. However, if a set time is to be required, it should be set by the local agency.

<u>2671. Temporary Closure</u>

In subsection (b)(4), for safety purposes, we suggest adding the following language:

> (4) <u>Except for required venting</u>, all fill and access locations and piping shall be sealed utilizing locked caps or concrete plugs;

<u>2672. Permanent Closure Requirements</u>

The hazardous waste requirements in subsection (b) for the disposition of underground storage tanks and their contents are beyond the Board's statutory authority and will be covered by the regulations of the Department of Health Services. We suggest deleting subsections (b)(1), (3), (4) and (5) and amending subsection (b) as follows:

> "Removal of underground storage tanks shall comply with Health and Safety Code sections, include Section 25245-25249, and the hazardous waste regulations found at ____ Cal. Admin. Code ______."

(The citations to the California Administrative Code should be left blank until the hazardous waste management regulations proposed by the Department of Health Services are adopted.)

Subsection (c) is also covered by the hazardous waste regulations presently being considered by the Department of Health Services for storage tank closure. Therefore, subsections (c)(1) and (2) should be deleted.

With regard to subsection (d), ongoing leak detection monitoring should not be needed if the tank has been properly cleaned. Therefore, we suggest that the word "ongoing" be deleted.

Article 8

2681. Categorical Variance

(1) 2681(b)(6)

This subsection requires a flat fee of $26,000 to accommmpany any application for a categorical variance. CUSA understands that an application fee is generally set to cover administrative expenses associated with processing an application. However, in some cases a categorical variance application may not incur the full $26,000 processing costs. We suggest that the Board require a cash deposit of $26,000 and, if processing costs turn out to be less than $26,000, that difference can be refunded to the applicant.

The same comment applies to the fee for a site-specific variance application in subsection 2682(e)(6), and the local agency application for additional standards in subsection 2691(a)(4).

2682. Site Specific Variance

(1) 2682(g)

The second to last sentence in this subsection appears to contain a typographical error. The section covers site-specific variances yet the language in the subsection refers to "a description of the proposed categorical variance." This should be "a description of the proposed site-specific variance."

Article 10

2711. Permit Application and Information

(1) 2711(b)

This subsection enumerates the information which is required in a permit application. Much of this information will have already been submitted by the owner or operator of the UST on the hazardous substance storage statement required by California Water Code § 13173. For example, items (1)-(6) and (9)-(11) in proposed subsection 2711(b) can be found in the statement. CUSA suggests that for those persons who have already submitted a hazardous substance storage statement the information in subsections 2711(b)(7)-(8) is all that should be required.

2712. Permit Conditions

(1) 2712(f)

This subsection establishes a provisional permit for those USTs which do "not completely conform with Articles 3 or 4 of this subdivision." However, these provisional permits are to be issued for no longer than three months without the possibility for extension or renewal. It is simply unrealistic to assume that efforts to bring nonconforming tanks up to the standards in the regulations will, in all cases, take no more than three months. It is also unrealistic to assume that local agencies will have the resources to inspect each nonconforming tank within 15 days of the expiration of the provisional permit. We ask that the Board allow the local agency the discretion to extend the provisional permit every three months for up to one year. The one year limit will assure that provisional permits are not used as operating permits and the periodic renewal will give the local agency the ability to retire a permit if the owner or operator takes no action to bring the tank into conformance with the regulations.

ATTACHMENT 4

CHEVRON U.S.A. PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

UNDERGROUND PETROLEUM STORAGE TANK
PROPOSED ALTERNATE GROUNDWATER
MONITORING PLAN

Introduction

Any successful leak detection monitoring system must consider within its design certain fundamental properties of the hazardous material being investigated. Some of the physical properties of the stored materials include: viscosity, volatility, solubility, and density. As water is the medium which the proposed regulations are intended to protect, comparisons of the physical properties of the hazardous material should be made with respect to water. In the particular instance of petroleum products, a general comparison with water reveals that petroleum products display a similar viscosity, higher volatility, low solubility, and immiscible. These physical properties reveal certain unique characteristics of petroleum products that are essential for understanding and establishing the best method for detecting leaks. Petroleum products with a viscosity similar to water implies that both substances migrate in the unsaturated zone at equivalent rates, with all other factors remaining constant. Petroleum products possess a high volatility, thereby they will readily vaporize (volatilize). Petroleum products with a density less than water will be positively buoyant (i.e., float). Petroleum products are immiscible and of low solubility. Therefore, little mixing and dissolving will be evident in water. When one considers these physical properties of petroleum products along with the geologic complexity witnessed in nature, an efficient monitoring program can be established which will protect the ground water from contamination.

It must be understood that most of the proposed methodologies are widely and successfully being used to detect the presence of subsurface contamination. However, much of the substantiative evidence is of the form of case histories and experience. As such, there is a wide range of opinions concerning the effectiveness of any one monitoring item. Thus, the monitoring plan must be considered en masse, each element contributing to the overall goal of early detection of a non-permitted discharge of a hazardous material and prevention of groundwater contamination.

Background Information

The purpose of the monitoring program is to detect as early as possible any leakage from an underground hazardous material storage facility should one occur. To accomplish this, site-specific monitoring devices are to be installed adjacent to the storage facility and are to monitor the first water-bearing zone and/or the immediate unsaturated zone beneath the storage facility, depending upon the depth of the water table beneath the facility.

In order to provide adequate coverage, monitoring requirements may vary from one storage facility to another based upon the depth of groundwater, the size of the facility, as well as the character and properties of the materials stored. At service stations, monitoring devices will be necessary for both the gasoline storage tanks and the waste oil tank. The specific installation and monitoring requirements for gasoline storage tanks and waste oil tanks will be identical, except as noted.

The installation and performance of the monitoring system require professional judgment and important field decisions. Therefore, a qualified professional should assume the technical responsibility for performance. For this purpose, the overall technical responsibility should be assumed by a State Certified Engineering Geologist or a State Registered Civil Engineer.

Monitoring Program

The specific monitoring technique or combination of techniques required at an underground petroleum storage tank facility will be based on the relative depth to the groundwater from the base of the storage tanks. At most service stations, the bottom of the retail petroleum storage tanks is 10 to 12 feet below grade, while the base of the waste oil tanks will be several feet less. The specified monitoring technique(s) for the underground tanks will be presented in three (3) separate cases: (1) Ground water encountered at less that 5 feet below the tank bottom, (2) Ground water encountered between 5 feet and 30 feet below the tank bottom, and (3) Ground water encountered at greater than 30 feet below the base of the tanks.

Case 1: (Ground water less than five feet below base of tank)

If ground water is encountered less than five feet below the bottom of tanks one groundwater monitor well per tank shall be installed on the downgradient side based on professional judgment. In the case when multiple storage tanks are placed side by side, the monitor wells shall be distributed along the perimeter of the tank cluster at approximately equal spacing.

Case 2: (Ground water between 5 to 30 feet below tank bottom)

If ground water is encountered at less than 30 feet but greater than 5 feet below the base of the tanks, a combination of vadose (unsaturated) zone and groundwater monitoring shall be used. Two (2) groundwater monitor wells shall be placed on the estimated down groundwater gradient side of the storage tank cluster, as based upon professional judgment, or at opposite ends of the tank cluster. In addition to the groundwater monitoring, two (2) vadose monitoring devices shall be installed. This monitoring device shall be located within ten feet of the storage tank. The monitoring requirements for a single underground tank shall differ from a cluster of tanks in that only one (1) groundwater and one (1) vadose monitor device shall be installed on the estimated down groundwater gradient side of the tank, as based on professional judgment.

Case 3: (Ground water at greater than 30 feet below tank bottom)

If a boring is extended to a depth of 30 feet below the bottom of the tank and no ground water is encountered, two vadose zone monitor devices will be used for each tank cluster. The vadose monitor devices will be located as close as feasible to the tank cluster and on opposite ends of the tanks.

The monitoring requirements for a single underground tank shall differ from a cluster of tanks in that only one (1) vadose monitor device shall be installed adjacent to the lowest point of the tank.

Installation Procedures

At those sites where the precise depth to ground water is not known, the procedure is to drill a hole in the natural formation within ten feet of the storage tank down to ground water or to a maximum depth of 30 feet below the base of the tank(s). The hole is to be placed on the estimated down groundwater gradient side of the storage facility, as based upon professional judgment. All borings are to be carefully logged and soil samples collected. Soil samples are to be obtained, starting at the bottom of the tank and every five feet to the water table.

All soil samples are to be described using the Unified Soil Classification system. Visual, olfactory, and/or tactile evidence of soil contamination are to be recorded on the log description.

If the boring fails to encounter ground water within 30 feet from the base of the tanks, the excess hole will be backfilled with concrete to five feet beneath the tank bottom. A vadose monitoring device will then be completed in the remainder of the borehole. The sampling ports of the vadose monitor device shall be completed in unsaturated materials within five feet beneath the tank bottom or at the base of the backfill materials.

When groundwater is encountered, the drilled hole will be extended into the uppermost water-bearing zone an amount sufficient to allow for seasonal groundwater fluctuation. A boring completion depth of 20 feet below the groundwater surface will be sufficient at most sites. Care should be taken during drilling so as not to breach a competent clay layer or aquitard. A competent aquitard shall be regarded as a low-permeability continuous layer of material with sufficient thickness to readily prevent the rapid vertical migration of fluids.

If groundwater wells are installed to monitor motor fuel storage tanks and/or waste oil tanks, the critical interval to monitor is the air-water interface. If groundwater levels fluctuate seasonally or on a long term basis, the screened interval of the monitor well must be necessarily larger to accommodate these variations. For the purposes of this monitor program, the screened interval shall extend ten feet above and 20 feet below the static fluid level unless local conditions or minimum annular seal dictate a change. At facilities that require vadose monitor devices, the perforated interval of casing shall be five feet in length and completed within five feet beneath the tank bottom or at the base of the tank backfill material.

Monitoring Requirements

Once the monitoring systems are installed at each site, periodic vadose and/or groundwater sampling will be necessary. Groundwater sampling shall be performed on a monthly basis, starting upon completion of the installation. Groundwater sampling is to be accomplished by using a clear (transparent) plastic ball-valve bailer. The water sample may then be inspected for the presence of odor and the observance of product on the water. *Vadose sampling shall be performed on a monthly basis.* Several vadose sampling methods shall be allowed. These methods include soil pore fluid sampling and vapor sampling. The specific vadose sampling technology must be capable of detecting the material contained in the storage tanks.

LIST OF CHARGES

Equipment

Truck-mounted Hollow Stem Auger with Operator and Helper	$100.00 to $150.00/hr
Pumping Truck and Equipment	$600.00/day

Personnel Rates

Registered Professional	$60.00 to $100.00/hr
Engineer/Geologist	$40.00 to $60.00/hr
Technician or Aide	$30.00/hr

Materials

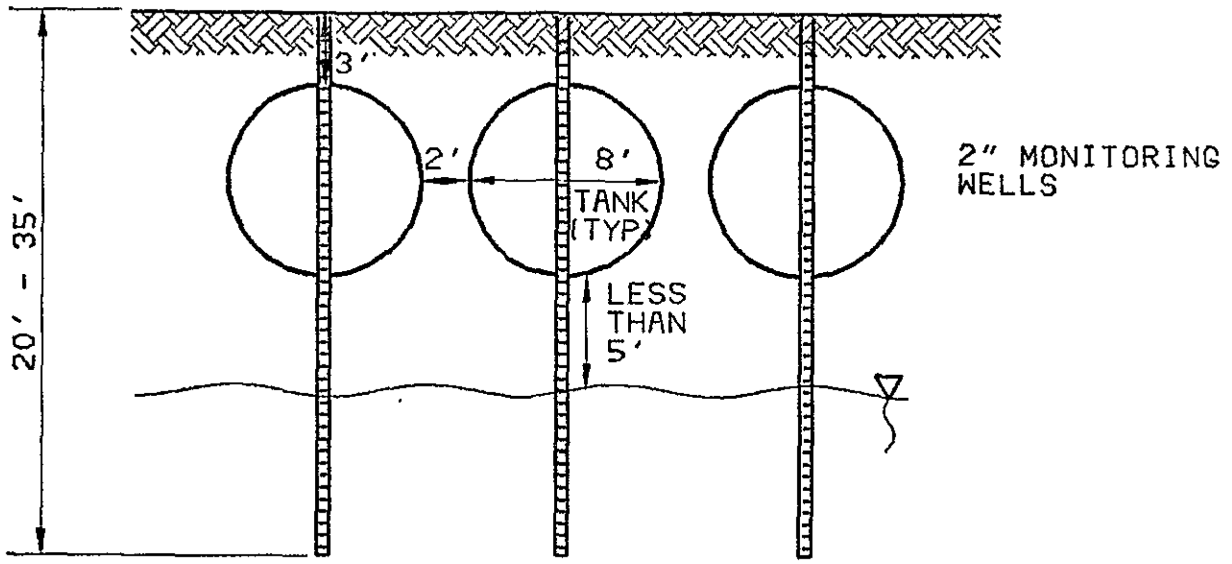
Slotted Casing (4-inch PVC)	$6.50/ft
Slotted Casing (2-inch PVC)	$4.50/ft
Solid Casing (4-inch PVC)	$5.00/ft
Solid Casing (2-inch PVC)	$4.00/ft
Annular Material (sand, grout, etc.)	$1.50/ft
Well Covers	$50.00 to $150.00/ea
Cement	$125.00/yd^3

Material Testing

Soil Analyses (EPA Method 602)	$50.00 to $150.00/sample
Vapor Analyses	$100.00/sample

CASE I

GROUND WATER LESS THAN 5 FEET BELOW THE TANK BOTTOM



GROUND WATER MONITORING SHALL BE INSTALLED WHEREVER GROUND WATER IS LESS THAN 5' BELOW THE TANK BOTTOM.

ONE WELL PER TANK ON THE DOWNGRADIENT SIDE.

WELLS TO BE MONITORED MONTHLY.

COST: \$6,300 - \$9,800
PER SERVICE STATION

G00056 (G05606) TWL 10/18/84

UNDERGROUND PETROLEUM STORAGE TANK

PROPOSED ALTERNATE MONITORING PLAN - INSTALLATION COSTS

CASE I (Ground Water less than 5 feet below tank invert)

Requirements:

- o Four groundwater monitor wells.
- o Three vadose monitor wells.

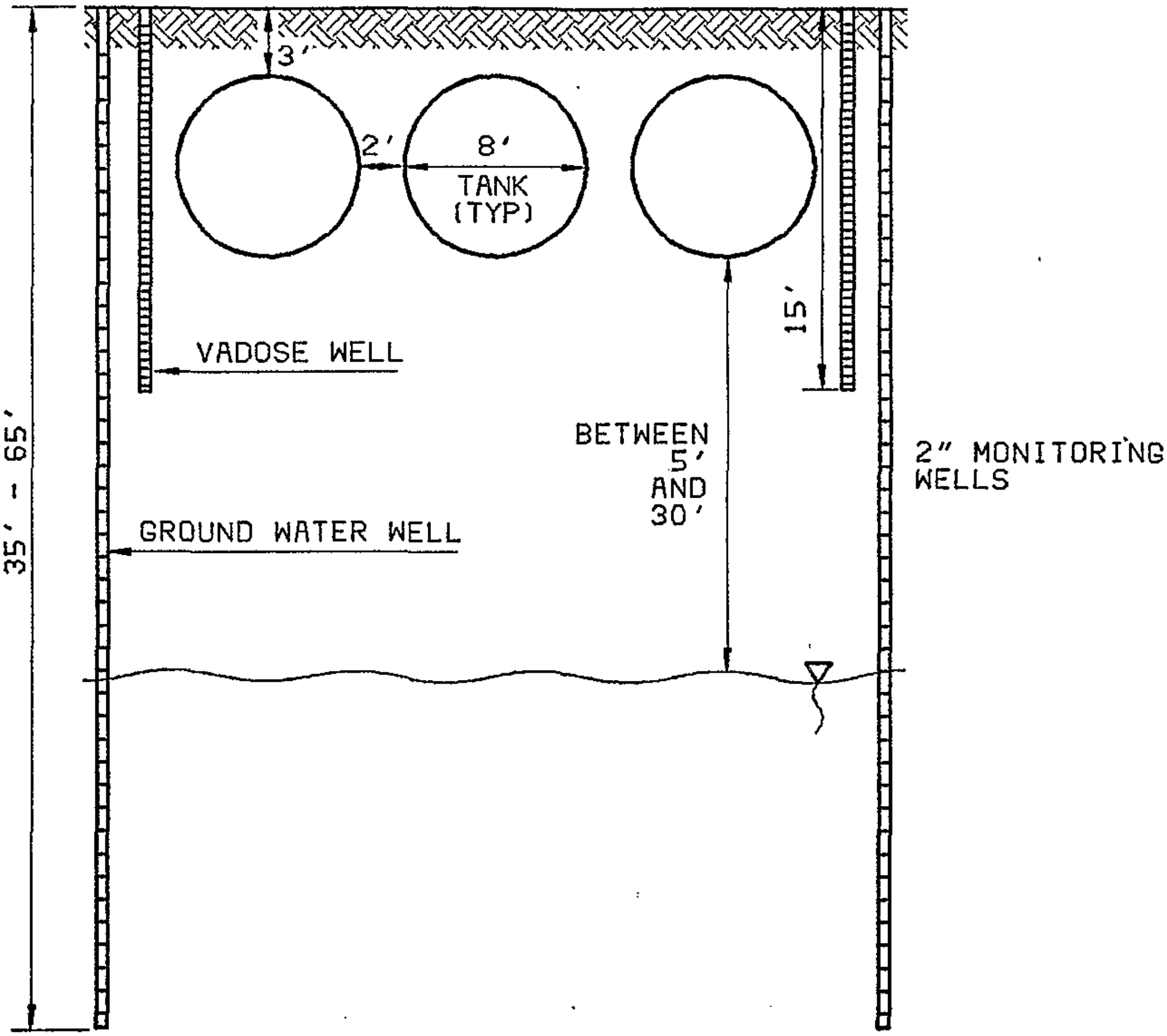
Itemized Costs:

Drilling	20 hours*	$2,000 to $3,000
Casing (2-inch PVC)	145 feet	$635
Annular Material	145 feet	$220
Well Covers	7 wells	$350 to $1,050
Registered Professional	4 hours	$240 to $600
Geologist/Engineer	32 hours	$1,280 to $1,920
Technician	12 hours	$360
Well Development	1 day	$600
Waste Removal	6 bbls.	$180
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Costs**	$6,300 to $9,800

* Assumes No Difficulties During Drilling
** No Monitoring Equipment Included.

CASE II

GROUND WATER 5 FEET TO 30 FEET BELOW THE TANK BOTTOM



2 GROUND WATER WELLS AND 2 VADOSE WELLS PER TANK CLUSTER.

1 GROUND WATER AND 1 VADOSE PER WASTE OIL TANK.

WELLS TO BE MONITORED MONTHLY.

COST: $7,100 - $10,800
PER SERVICE STATION

G00056 (G05607) TWL 10/18/84

UNDERGROUND PETROLEUM STORAGE TANK

PROPOSED ALTERNATE MONITORING PLAN - INSTALLATION COSTS

CASE II (Ground Water 5 feet to 30 feet below tank invert)

Requirements:

- o Three groundwater monitor wells.
- o Three vadose monitor wells.

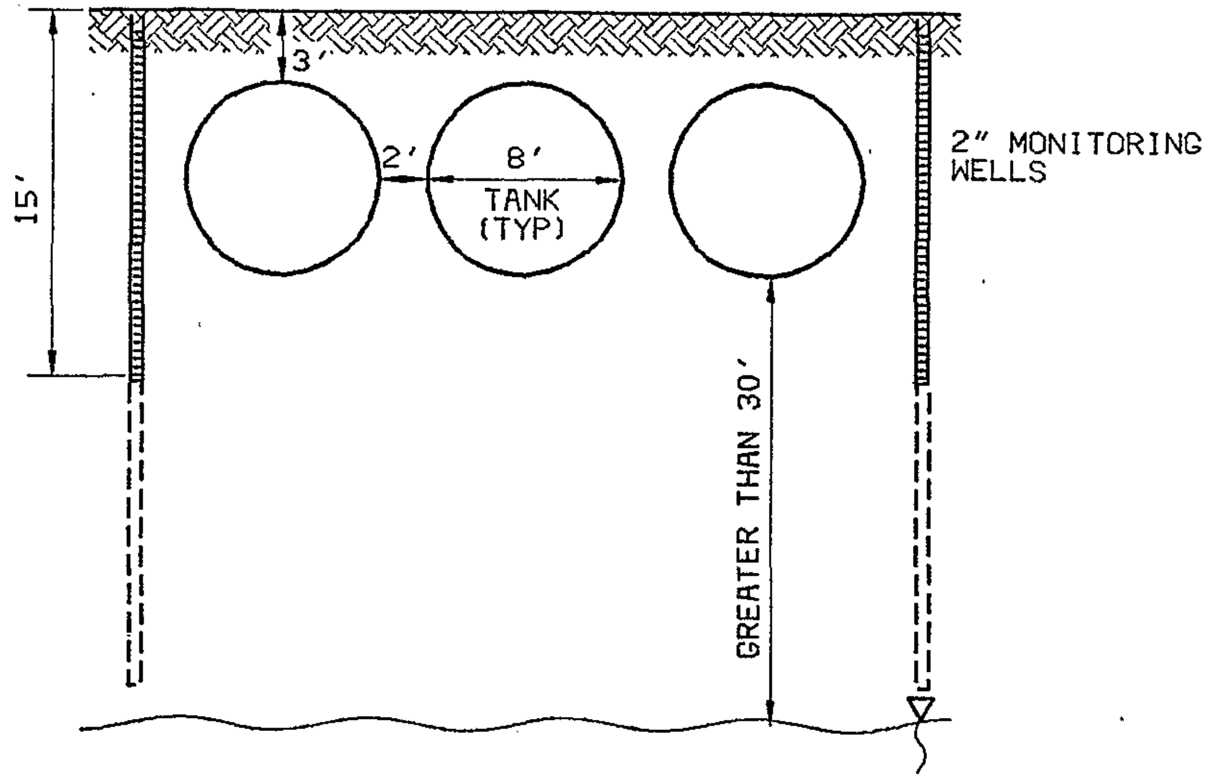
Itemized Costs:

Drilling	24 hours*	$2,400 to $3,600
Casing (2-inch PVC)	195 feet	$850
Annular Materials	195 feet	$290
Well Covers	6 wells	$300 to $900
Registered Professional	4 hours	$240 to $600
Geologist/Engineer	36 hours	$1,440 to $2,160
Technician	12 hours	$360
Well Development	1 day	$600
Waste Removal	8 bbls.	$250
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Costs**	$7,100 to $10,800

* Assumes No Difficulties During Drilling
** No Monitoring Equipment Included.

CASE III

GROUND WATER GREATER THAN 30 FEET
BELOW THE TANK BOTTOM



EXPLORATORY BORINGS SHALL BE DRILLED TO DETERMINE GROUND WATER DEPTH.

2 VADOSE WELLS PER TANK CLUSTER.

1 VADOSE WELL PER WASTE OIL TANK.

WELLS TO BE MONITORED MONTHLY.

COST: $4,200 - $6,800
PER SERVICE STATION

G0056 (G05608) TWL 10/18/84

UNDERGROUND PETROLEUM STORAGE TANK

PROPOSED ALTERNATE MONITORING PLAN - INSTALLATION COSTS

CASE III (Ground Water greater than 30 feet below the tank invert)

Requirements:

- o Three vadose monitor wells.
- o Three exploratory borings.

Itemized Costs:

Drilling	16 hours*	$1,600 to $2,400
Casing (2-inch PVC)	45 feet	$190
Annular Materials	120 feet	$180
Well Covers	3 wells	$150 to $450
Registered Professional	4 hours	$240 to $400
Geologist/Engineer	24 hours	$960 to $1,440
Technician	12 hours	$360
Waste Removal	5 bbls.	$160
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Costs**	$4,200 to $6,800

* Assumes No Difficulties During Drilling
** No Monitoring Equipment Included.

#53 - Noteware \ WR

OCT 19 1984

Board Members received originals cc:
Anton
Wilson
WRA
MAC/WGP

Chevron

Chevron U.S.A. Inc.
575 Market Street, San Francisco, California
Mail Address: P.O. Box 7006, San Francisco, CA 94120-7006

October 18, 1984

RECEIVED BY
OCT 19 1984
OFFICE OF THE
CHIEF COUNSEL

Proposed Regulations to Implement
A.B. 1362 - Underground Storage Tanks

Mr. Doug Noteware
State Water Resources Control Board
901 P Street
Sacramento, CA 95

This letter contains essentially the same information as #53-Singer. There are minor changes in wording in the cover letter.

Dear Mr. Noteware:

On October 9, 198 ... hell met with you to discuss the propose ... We appreciate the opportunity to share ... ed a complete package of the information ... additional details on our interpretation o ... t a similar package to each board member.

As was discussed d ... s of Article 4 of the proposed regulation ... elieve that proposed regulations in Articl ... ts of A.B. 1362 in the following areas:

(i) Local ag... natives;

(ii) The availability of monitoring alternatives described in the statute;

(iii) Local agency discretion regarding implementation of the groundwater monitoring alternative;

(iv) The necessity of the specific approach proposed in the regulations to achieve the objectives of the statute.

(v) The justification, for a separate monitoring alternative for motor vehicle fuel tanks.

Attachment 1 addresses these five issues in greater detail.

Attachment 2 is provided as a summary of the proposed regulations and estimated installation costs per service station. Some of the technical problems within Article 4 which were discussed during our meeting include the number and depth of slant borings, groundwater monitor wells, and vadose monitor wells. Rather than include a detailed discussion of our technical concerns regarding Article 4, we plan to submit our complete set of comments on the proposed regulations at the public hearing.

To provide you with a complete package, Attachment 3 is a proposed monitoring alterative if this alternative monitoring is required by the local agency. The cost breakdowns for these alternative proposals were not included in our previous handouts.

In light of the arguments made in Attachment 3 regarding the unique physical properties of petroleum products, we believe Article 4 should be reorganized to address motor vehicle fuel tanks and non-motor vehicle fuel tanks separately. This would be consistent with the format of Article 3 and the intent of the statute.

Again, we appreciate the opportunity to share our concerns with you, and will be pleased to work with you and your staff to finalize this regulation.

Sincerely,

Keith D. Blattman

KDB:afkK3
Attachments

cc: Mr. Michael Kahl

ATTACHMENT 1

DISCUSSION OF A.B. 1362 STATUTORY REQUIREMENTS WITH REGARD TO PROPOSED REGULATIONS

SUMMARY OF LEGAL CONCERNS REGARDING PROPOSED ARTICLE 4

Introduction

The regulations proposed in Article 4 for the monitoring of existing underground hazardous substance storage tanks raise several legal concerns. The following are the issues of principal concern:

1) The lack of local agency discretion to select monitoring alternatives.

2) The failure to allow use of the monitoring alternatives described in the statute.

3) The lack of local agency discretion regarding implementation of the groundwater monitoring alternative.

4) The lack of substantial evidence demonstrating the necessity of the specific approach taken in Article 4 to achieve the aims of the statute.

These issues are discussed in more detail below. In addition, a final comment briefly discusses the justification for including a separate monitoring alternative specifically for motor vehicle fuel tanks.

Discussion

1) Local agency discretion to select monitoring alternatives

The regulations proposed in Article 4 for monitoring existing underground tanks are inconsistent with the statute because they do not allow local agencies the discretion required by the statute to choose between monitoring alternatives. By thus limiting local agency discretion, the State Water Resources Control Board ("SWRCB") would exceed its own authority to provide monitoring alternatives under the statute.

a) Statutory provisions

The statutory provisions for existing underground storage tanks appear in Health and Safety Code section 25284.1. Subdivision (a) of that section requires facilities with such tanks to be outfitted with a monitoring system capable of detecting unauthorized releases of hazardous substances stored in the facility. For this purpose, subdivision (b) requires that a means of visual inspection be provided wherever practical. Subdivision (b) also provides, however, that:

> "Alternative methods of monitoring the tank on a monthly, or more frequently basis, may be required by the local agency, consistent with the regulations of [SWRCB]. The alternative monitoring methods include, but are not limited to, [three methods described in the statute]" (emphasis added).

b) Proposed regulations

The regulations proposed in Article 4 to implement these statutory provisions set forth requirements for several different types of monitoring. However, with some exception for tanks that can be visually inspected, the different types of monitoring are provided, not as alternatives, but as components of a single, complex monitoring system. The local agency generally must require use of this complex system whenever full visual inspection cannot be provided. Thus the regulations do not provide local agencies with any real alternatives, much less with discretion to select between such alternatives. The local agencies also are not provided any discretion to develop their own monitoring alternatives.

c) Discussion

This failure to allow local agencies discretion to determine which of several alternatives is appropriate for any given tank is inconsistent with the statute. One infers from the statements in subdivision (b) of Health and Safety Code section 25284.1 quoted above that the Legislature intended SWRCB to adopt regulations that either provide monitoring alternatives or that allow local agencies to define monitoring alternatives. Indeed, it appears that at least the three alternatives described in the statute must be available to local agencies. One also infers that the Legislature intended the regulations to allow local agencies the discretion to select the alternatives to be applied in any particular case. Otherwise, no purpose is served by the statement in subdivision (b) of section 25284.1 that monitoring alternatives may be required by local agencies. By denying local agencies the discretion mandated in the statute, SWRCB would also exceed its own statutory authority.

2) Availability of alternatives described in the statute

The proposed system is also inconsistent with the statute in that it does not allow use of any one of the specific alternatives required by the statute. The alternatives described in the statute are:

(i) Pressure, vacuum or hydrostatic testing;

(ii) Groundwater monitoring well(s) combined with soil analysis upon well installation and, when appropriate, vapor analysis; and

(iii) Inventory control plus tank testing for motor vehicle fuel tanks.

As mentioned above, the language of the statute appears to require that at least these three alternatives be available to local agencies.

In contrast, the regulations require as a single system, visual inspection, soil testing, tank testing, inventory control, vadose zone monitoring and groundwater detection and assurance monitoring. Thus the regulatory system requires a combination of elements from all three of the statutory alternatives plus the additional elements of vadose zone monitoring and slant boring. Furthermore, the regulations do not provide any alternative specifically for motor vehicle fuel tanks.

3) Local agency discretion regarding implementation of groundwater monitoring alternative

The statute also provides local agencies discretion in implementing the groundwater monitoring alternative. Article 4 is inconsistent with the statute in that Article 4 does not afford local agencies this discretion.

a) Statutory provision

The statute describes the groundwater monitoring alternative as follows:

> "A groundwater monitoring well or wells which are down gradient and adjacent to the underground storage tank, vapor analysis within a well where appropriate, and analysis of soil borings at the time of initial installation of the well. [SWRCB] shall develop regulations specifying monitoring alternatives. The local agency * * * shall approve the location and number of wells, the depth of wells and the sampling frequency, pursuant to these regulations" (Health & Saf.Code, § 25284.1(b)(2); emphasis added).

b) Discussion

The quoted language clearly directs SWRCB to adopt monitoring alternatives, rather than a single monitoring method. Further, the last sentence of the quoted provision indicates that the Legislature intended the local agencies to have discretion to determine the appropriate number, depth and location of wells and the appropriate sampling frequency for any given tank. The proposed regulations, however, essentially specify the configuration of wells and the minimum monitoring frequency that the local agency must require for any given tank. In addition to being inconsistent with the statute, this system would actually prevent local agencies from taking into consideration the site-specific factors that are relevant to determining the elements of the groundwater monitoring system actually needed to detect unauthorized releases. For example, local agencies could not consider factors such as the nature of the substance in the tank, the nature of the soil layers beneath the tank, the direction and rate of groundwater flow and the other types of monitoring to be performed. Thus, in many cases, the proposed regulations would force local agencies to require a groundwater monitoring system that is not necessary to achieve the aims of the statute.

One can also argue that the regulations are inconsistent with the statutory groundwater monitoring alternative in another aspect. The statute calls for analysis of the soil removed from the groundwater well or wells upon initial installation. The regulations, however, require the drilling of separate, slant-drilled wells to perform soil analysis.

4) Necessity of the specific measures proposed

To be valid, a regulation must be reasonably necessary to effectuate the purposes of the statute (Gov.Code, § 11342.2). In addition, the Office of Administrative Law is specifically required to review the regulations against a standard of "necessity" (Gov.Code, § 11349.1). This standard defines "necessity" to mean that "the rulemaking proceeding demonstrates by substantial evidence the need for the regulation" (Gov.Code, § 11349(a)).

Health and Safety Code section 25284.1 clearly indicates that the purpose of monitoring existing underground storage tanks is to detect current or future unauthorized releases of any hazardous substances stored in such tanks. That section also provides several specific alternatives presumably intended to achieve this aim. In a number of areas, technical analysis indicates that the specific measures required by the regulations are not necessary either to detect unauthorized releases or to implement the specific alternatives provided for this purpose. Moreover, the Statement of Reasons generally provides little or no factual basis for the specific requirements proposed in these areas. Therefore, we question the adequacy of the justification provided and the validity of the regulations in these areas.

This concern and the supporting technical analysis have already been discussed briefly with SWRCB members, and detailed technical analysis will be submitted at the hearing to be held on October 23, 1984. Therefore, the following discussion is intended simply to highlight the areas of concern that will be discussed more fully in the later comments.

a) Redundancy of monitoring methods

The principal area of concern involves the requirements in Article 4 that impose redundant monitoring methods. As discussed above, none of the monitoring alternatives specified in the statute require the full complement of methods potentially required by Article 4. Further, as the technical analysis to be submitted at the hearing will show, the methods required by Article 4 overlap to a degree that is not necessary to assure adequate leak detection. This analysis will address the following requirements:

(i) Separate slant boring;

(ii) Vadose zone monitoring in areas where groundwater rises above five feet below the tank bottom;

(iii) Groundwater monitoring in areas where groundwater is quite far below the tank bottom;

(iv) Continuous vapor monitoring;

(v) Weekly groundwater monitoring;

(vi) Number, location, depth and construction of groundwater wells.

b) Requirements directly contrary to statutory purpose

Technical analysis also indicates that certain requirements are unnecessary because they are contrary to the general purpose of the statute, which is to protect groundwater from contamination. Examples are the requirements to drill wells and install perforated casings to specified depths without regard to the possibility that such wells will breach competent aquitards. Breaching a competent aquitard destroys natural protection against groundwater contamination. Further, the perforated casings can create a direct pathway to spread the contamination.

c) Identification of past contamination and general water quality

A final area of concern involves the regulatory provisions that either state or have as a purpose the detection of past releases or the direct monitoring of groundwater without regard to the need for such measures to detect current or future releases. Examples appear in subdivisions (a) through (c) of section 2640 of the regulations. Unless information regarding past contamination is needed to detect current or future leaks, monitoring for past contamination is not necessary to achieve the aims of the statute and therefore should not be required in these regulations. Furthermore, even where information regarding past contamination is needed to achieve the statutory goals, the regulations should not require separate, additional borings for this purpose in cases where the monitoring alternative selected by the local agency requires monitoring wells that will yield soil samples.

5) Justification for a special alternative for motor vehicle fuel tanks

Inclusion of a separate alternative in Article 4 for motor vehicle fuel tanks is appropriate for several reasons. First, motor vehicle fuel tanks constitute a relatively large portion of all underground tanks. Indeed, SWRCB Staff estimates that over two-thirds of all underground hazardous substance storage tanks are motor vehicle fuel tanks. Second, as was discussed with SWRCB members and as the technical analysis to be presented will show, special monitoring systems can be designed for these tanks based on the particular properties of motor vehicle fuel that affect its migration and detection. Third, significant efforts have already been made by the petroleum industry to design systems to address the problems of leaky tanks. The results of these efforts may affect the need for additional measures required to achieve the aims of the statute.

In addition, support for a separate motor vehicle fuel alternative appears in the statute itself. The statute includes several provisions addressing motor vehicle fuel tanks separately from other kinds of tanks. These provisions appear in both the new and existing tank standards as well as the tank repair provision. One infers from these provisions that the Legislature recognized that motor vehicle fuel tanks warrant separate consideration.

It should also be pointed out that the definition proposed in the regulations for "motor vehicle", and hence for "motor vehicle fuel tank", is unnecessarily narrow (proposed § 2620). "Motor vehicle" is defined to include only vehicles used on highways. Consequently, the term "motor vehicle fuel tank" is limited to tanks storing fuels for such vehicles only, even though fuels for other vehicles have the same or similar properties from the standpoint of leak detection. The concern under the statute is detection of a hazardous substance if it leaks and not the type of vehicle the substance is used in. Therefore, motor vehicle fuel should be defined to include all motor vehicle fuels and not just those fuels used in highway vehicles.

ATTACHMENT 2

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN – INSTALLATION COSTS

LIST OF CHARGES

Equipment

Truck-mounted Hollow Stem Auger with Operator and Helper	$100.00 to $150.00/hr
Pumping Truck and Equipment	$600.00/day

Personnel Rates

Registered Professional	$60.00 to $100.00/hr
Engineer/Geologist	$40.00 to $60.00/hr
Technician or Aide	$30.00/hr

Materials

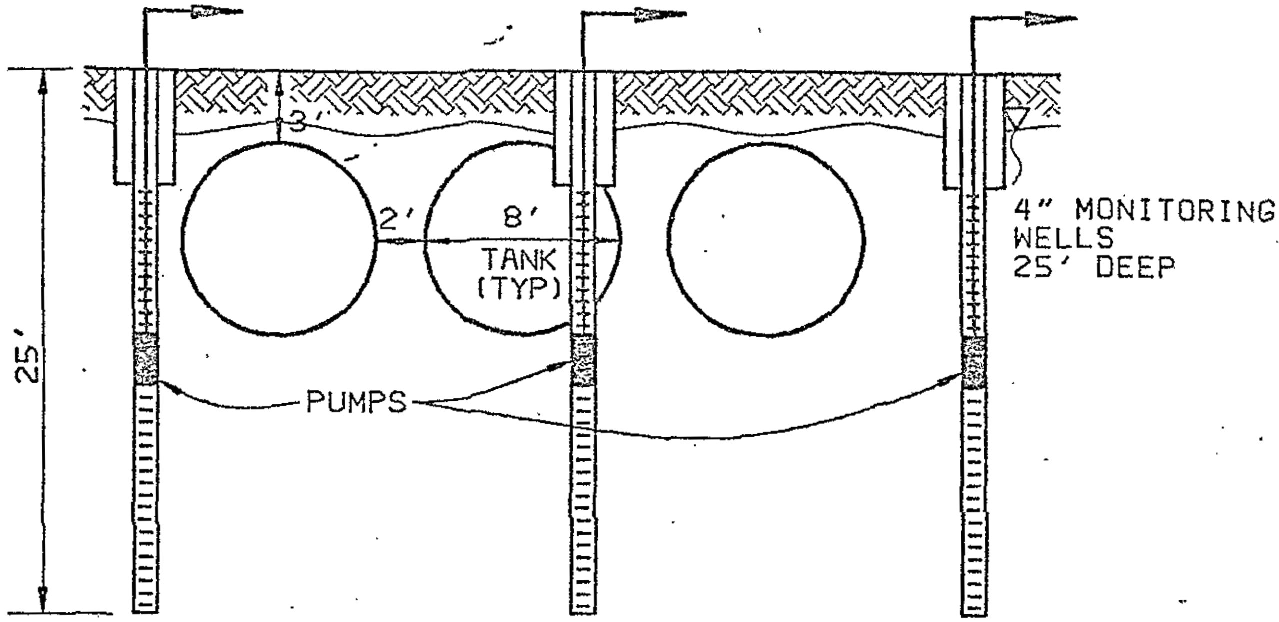
Slotted Casing (4-inch PVC)	$6.50/ft
Slotted Casing (2-inch PVC)	$4.50/ft
Solid Casing (4-inch PVC)	$5.00/ft
Solid Casing (2-inch PVC)	$4.00/ft
Annular Material (sand, grout, etc.)	$1.50/ft
Well Covers	$50.00 to $150.00/ea
Cement	$125.00/$yd^3$

Material Testing

Soil Analyses (EPA Method 602)	$50.00 to $150.00/sample
Vapor Analyses	$100.00/sample

CASE I

GROUND WATER 0 TO 5 FEET BELOW GRADE



GROUND WATER MONITORING SHALL BE INSTALLED WHEREVER GROUND WATER IS LESS THAN 5' BELOW GRADE.

WELLS SHALL BE INSTALLED AT 120° SPACING AROUND THE TANK OR FACILITY. DISTANCE BETWEEN WELLS SHALL NOT BE GREATER THAN 30'. THIS WILL REQUIRE 3 WELLS FOR EVERY WASTE OIL TANK AND AT LEAST 4 FOR EVERY 3 PRODUCT TANKS. TOTAL: MINIMUM 7 WELLS

WELLS SHALL BE MONITORED A MINIMUM OF ONCE PER WEEK.

PUMP SHOULD BE CAPABLE OF DRAWING WATER 10' BELOW TOP OF PERFORATIONS.

COST: \$15,700 - \$24,400
PER SERVICE STATION

G0056 (G0[illegible]01) TWL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE I (Ground Water 0 to 5 feet below grade)

Requirements:

- o Seven groundwater monitor wells.
- o Seven dewatering pumps.

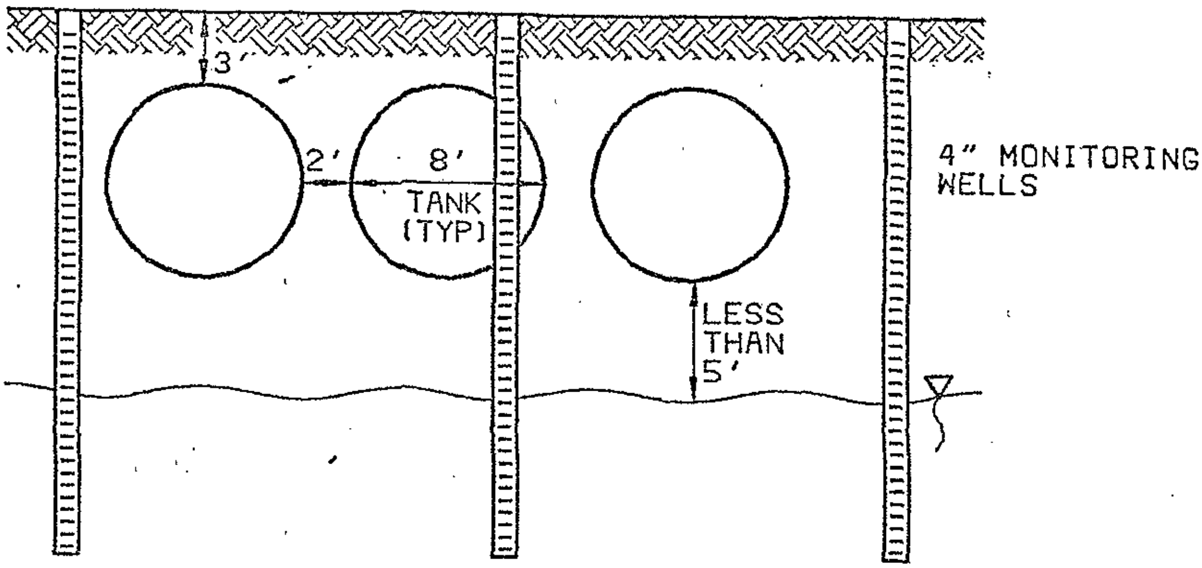
Itemized Costs:

Drilling	20 hours*	$2,000 to $3,000
Casing (4-inch PVC)	175 feet	$1,100
Annular Material	175 feet	$260
Pumps	7 @ $1,000 to $1,500	$7,000 to $10,500
Well Covers	7 wells	$350 to $1,050
Registered Professional	32 hours	$1,920 to $3,200
Technician	16 hours	$480
Well Development	1 day	$600
Waste Removal	7 bbls.	$220
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$15,700 to $24,400

* Assumes No Difficulties During Drilling.
** No Continuous Monitoring Equipment Included.

CASE II

GROUND WATER 5 FEET BELOW GRADE TO 5 FEET BELOW TANK INVERT



GROUND WATER MONITORING SHALL BE INSTALLED WHEREVER GROUND WATER IS LESS THAN 5' BELOW THE TANK BOTTOM.

WELLS SHALL BE INSTALLED AT 120° SPACING AROUND THE TANK OR FACILITY. DISTANCE BETWEEN WELLS SHALL NOT BE GREATER THAN 30'. THIS WILL REQUIRE 3 WELLS FOR EVERY WASTE OIL TANK AND AT LEAST 4 FOR EVERY 3 PRODUCT TANKS. TOTAL: MINIMUM 7 WELLS

WELLS SHALL BE MONITORED A MINIMUM OF ONCE PER WEEK.

VADOSE ZONE DETECTION MONITORING IS REQUIRED.

COST: $15,900 - $25,300
PER SERVICE STATION

G0005G (G05B02) THL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE II (Ground Water 5 feet below grade to 5 feet below tank invert)

Requirements:

- o Seven groundwater monitor wells.
- o Six vadose monitor wells.
- o Four slant soil borings.

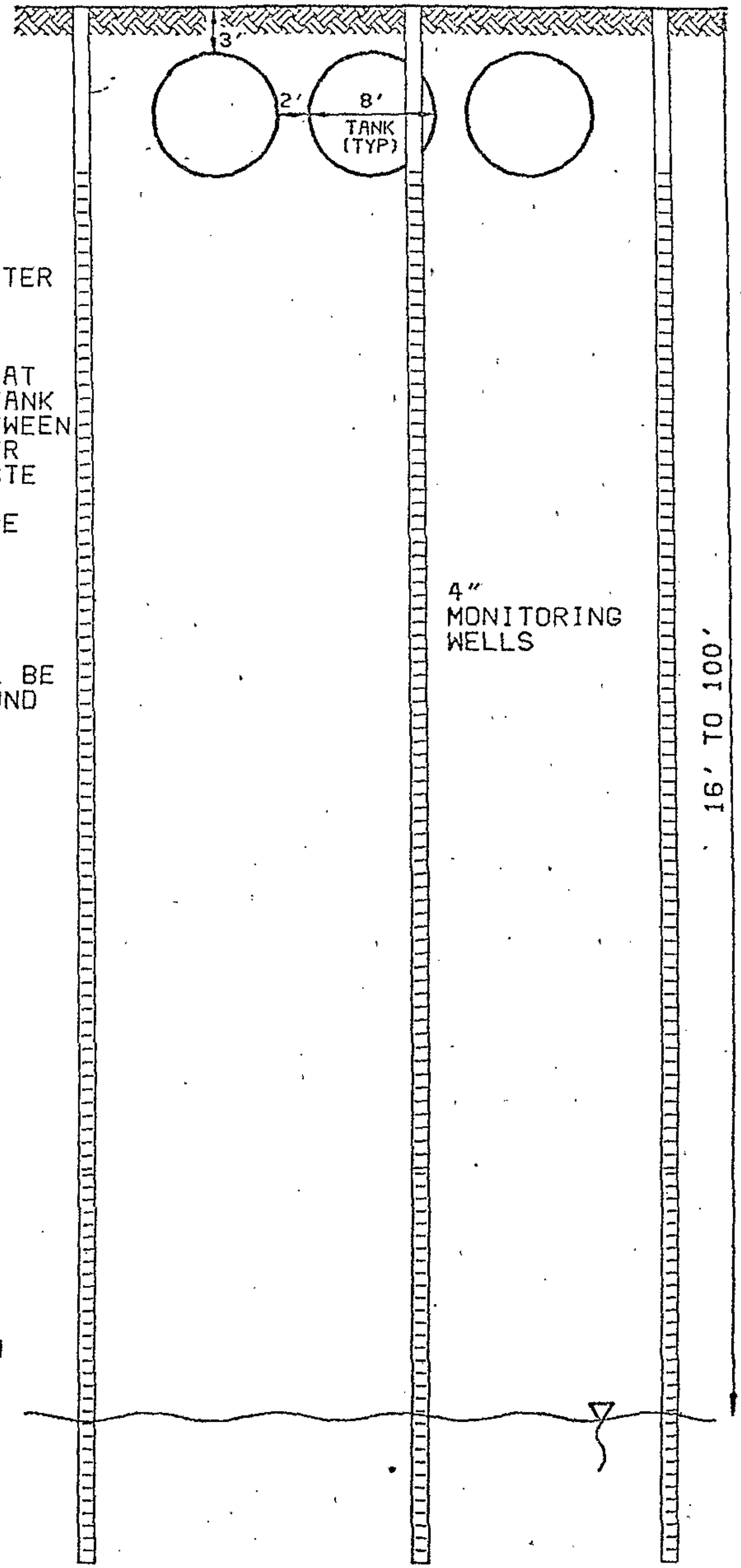
Itemized Costs:

Drilling	40 hours*	$4,000 to $6,000
Casing (4-inch PVC)	370 feet	$2,300
Annular Material	370 feet	$550
Well Covers	13 wells	$650 to 1,750
Registered Professional	60 hours	$3,600 to $6,000
Technician	24 hours	$720
Well Development	1 day	$600
Soil Borings	8 hours	$800 to $1,200
Soil Analyses	8 to 16 samples	$400 to $2,400
Vadose Demonstration		
Professional	12 hours	$480 to $800
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	14 bbls.	$390
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$15,900 to $25,300

* Assumes No Difficulties During Drilling.
** No Continuous Monitoring Equipment Included.

CASE III

GROUND WATER 5 FEET BELOW INVERT TO 100 FEET BELOW GRADE



NOT REQUIRED IF GROUND WATER IS LESS THAN 16' FROM THE SURFACE.

WELLS SHALL BE INSTALLED AT 120° SPACING AROUND THE TANK OR FACILITY. DISTANCE BETWEEN WELLS SHALL NOT BE GREATER THAN 30'. BETWEEN THE WASTE OIL & PRODUCT TANKS A MINIMUM OF 7 WELLS WILL BE REQUIRED.

WELLS SHALL BE MONITORED SEMI-ANNUALLY.

EXPLORATORY BORINGS SHALL BE DRILLED TO DETERMINE GROUND WATER ELEVATION.

COST: $29,400 - $45,700
PER SERVICE STATION

G0056 (G05603) TWL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE III (Ground Water 5 feet below tank invert to 100 feet below grade)

Requirements:

- o Seven groundwater monitor wells.
- o Six vadose monitor wells.
- o Four slant soil borings.

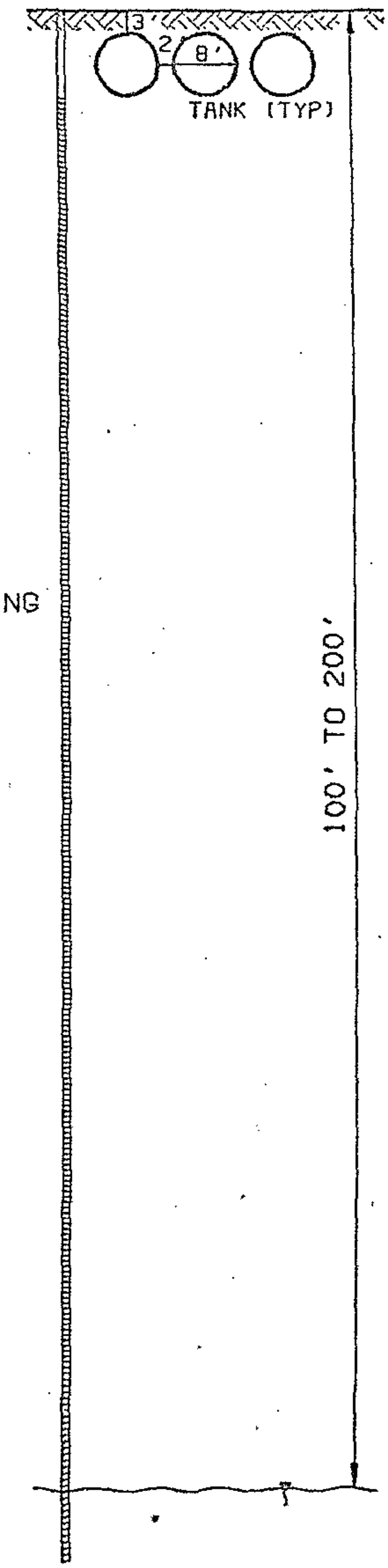
Itemized Costs:

Drilling	64 hours*	$6,400 to $9,600
Casing (4-inch PVC)	790 feet	$4,985
Annular Material	790 feet	$1,185
Well Covers	13 wells	$650 to $1,950
Registered Professional	104 hours	$6,240 to $10,400
Technician	36 hours	$1,080
Well Development	2 days	$1,200
Soil Borings	24 hours	$2,400 to $3,600
Soil Analyses	52 samples	$2,600 to $7,800
Vadose Demonstration		
Professional	12 hours	$720 to $1,200
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	35 bbls.	$730
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$29,400 to $45,700

* Assumes No Difficulty During Drilling.
** No Continuous Monitoring Equipment Included.

CASE IV

GROUND WATER 100 FEET TO 200 FEET BELOW GRADE



ONLY ONE DOWNGRADIENT WELL
REQUIRED.

NOT REQUIRED IF GROUND WATER
IS GREATER THAN 200'

SHALL BE MONITORED SEMI-ANNUALLY

EXPLORATORY BORINGS SHALL
BE DRILLED TO DETERMINE
GROUND WATER ELEVATION.

4"
MONITORING
WELLS

COST: $19,600 - $32,700
PER SERVICE STATION

G00056 (G05604) TWL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE IV (Ground Water 100 feet to 200 feet below grade)

Requirements:

- One groundwater monitor well.
- Six vadose monitor wells.
- Four slant soil borings.

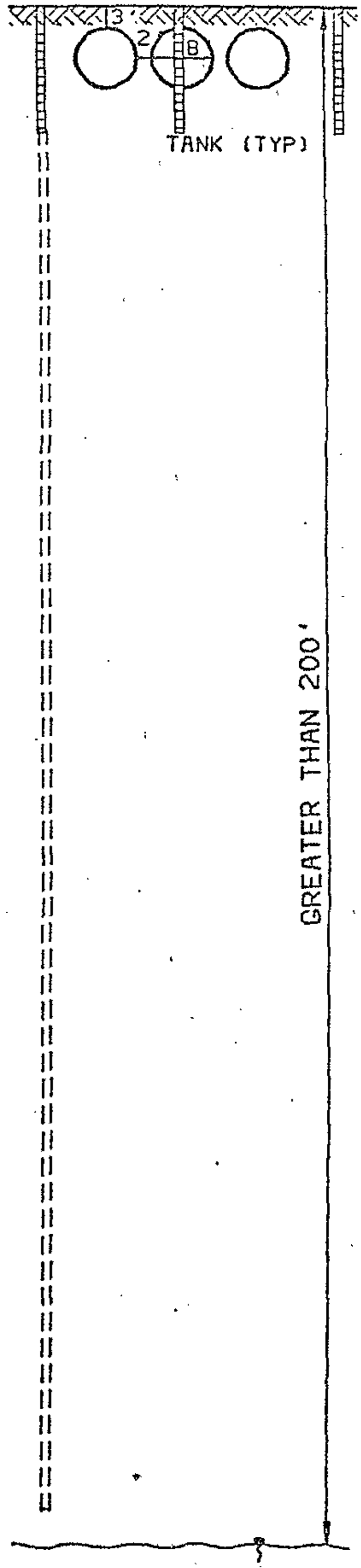
Itemized Costs:

Drilling	36 hours*	$3,600 to $5,400
Casing (4-inch PVC)	290 feet	$1,645
Annular Material	290 feet	$570
Well Covers	7 wells	$350 to $1,050
Registered Professional	72 hours	$4,320 to $7,200
Technician	20 hours	$600
Well Development	1 day	$600
Soil Boring	24 hours	$2,400 to $3,600
Soil Analyses	52 samples	$2,600 to $7,800
Vadose Demonstration		
Professional	12 hours	$720 to $1,200
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	10 bbls.	$300
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$18,900 to $32,000

* Assumes No Difficulty During Drilling.
** No Continuous Monitoring Equipment Included.

CASE V

GROUND WATER GREATER THAN 200 FEET BELOW GRADE



EXPLORATORY BORINGS SHALL
BE DRILLED TO DETERMINE
GROUND WATER ELEVATION.

VADOSE ZONE MONITORING IS REQUIRED.

ASSURANCE WELL IS BACKFILLED IF
GROUND WATER IS GREATER THAN 200'.

COST: $17,400 - $30,400
PER SERVISE STATION

G00056 (G05605) TWL 10/15/84

WATER RESOURCES CONTROL BOARD PROPOSED UNDERGROUND STORAGE TANK MONITORING PLAN - INSTALLATION COSTS

CASE V (Ground Water greater than 200 feet below grade)

Requirements:

- o One exploratory boring to 200 feet.
- o Six vadose monitor wells.
- o Four slant soil borings.

Itemized Costs:

Drilling	36 hours*	$3,600 to $5,400
Casing (4-inch PVC)	90 feet	$540
Cement Seal	7 yd^3	$875
Annular Material	90 feet	$135
Well Covers	6 wells	$300 to $900
Registered Professional	72 hours	$4,320 to $7,200
Technician	16 hours	$480
Soil Borings	24 hours	$2,400 to $3,600
Soil Analyses	52 samples	$2,600 to 7,800
Vadose Demonstration		
Professional	12 hours	$720 to $1,200
Technician	12 hours	$360
Vapor Analyses	4 samples	$400
Waste Removal	10 bbls.	$300
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Cost**	$17,400 to $30,400

* Assumes No Difficulty During Drilling
** No Continuous Monitoring Equipment Included.

ATTACHMENT 3

UNDERGROUND PETROLEUM STORAGE TANK
PROPOSED ALTERNATE GROUNDWATER MONITORING PLAN

UNDERGROUND PETROLEUM STORAGE TANK
PROPOSED ALTERNATE GROUNDWATER
MONITORING PLAN

Introduction

Any successful leak detection monitoring system must consider within its design certain fundamental properties of the hazardous material being investigated. Some of the physical properties of the stored materials include: viscosity, volatility, solubility, and density. As water is the medium which the proposed regulations are intended to protect, comparisons of the physical properties of the hazardous material should be made with respect to water. In the particular instance of petroleum products, a general comparison with water reveals that petroleum products display a similar viscosity, higher volatility, low solubility, and immiscible. These physical properties reveal certain unique characteristics of petroleum products that are essential for understanding and establishing the best method for detecting leaks. Petroleum products with a viscosity similar to water implies that both substances migrate in the unsaturated zone at equivalent rates, with all other factors remaining constant. Petroleum products possess a high volatility, thereby they will readily vaporize (volatilize). Petroleum products with a density less than water will be positively buoyant (i.e., float). Petroleum products are immiscible and of low solubility. Therefore, little mixing and dissolving will be evident in water. When one considers these physical properties of petroleum products along with the geologic complexity witnessed in nature, an efficient monitoring program can be established which will protect the ground water from contamination.

It must be understood that most of the proposed methodologies are widely and successfully being used to detect the presence of subsurface contamination. However, much of the substantiative evidence is of the form of case histories and experience. As such, there is a wide range of opinions concerning the effectiveness of any one monitoring item. Thus, the monitoring plan must be considered en masse, each element contributing to the overall goal of early detection of a non-permitted discharge of a hazardous material and prevention of groundwater contamination.

Background Information

The purpose of the monitoring program is to detect as early as possible any leakage from an underground hazardous material storage facility should one occur. To accomplish this, site-specific monitoring devices are to be installed adjacent to the storage facility and are to monitor the first water-bearing zone and/or the immediate unsaturated zone beneath the storage facility, depending upon the depth of the water table beneath the facility.

In order to provide adequate coverage, monitoring requirements may vary from one storage facility to another based upon the depth of groundwater, the size of the facility, as well as the character and properties of the materials stored. At service stations, monitoring devices will be necessary for both the gasoline storage tanks and the waste oil tank. The specific installation and monitoring requirements for gasoline storage tanks and waste oil tanks will be identical, except as noted.

The installation and performance of the monitoring system require professional judgment and important field decisions. Therefore, a qualified professional should assume the technical responsibility for performance. For this purpose, the overall technical responsibility should be assumed by a State Certified Engineering Geologist or a State Registered Civil Engineer.

Monitoring Program

The specific monitoring technique or combination of techniques required at an underground petroleum storage tank facility will be based on the relative depth to the groundwater from the base of the storage tanks. At most service stations, the bottom of the retail petroleum storage tanks is 10 to 12 feet below grade, while the base of the waste oil tanks will be several feet less. The specified monitoring technique(s) for the underground tanks will be presented in three (3) separate cases: (1) Ground water encountered at less that 5 feet below the tank bottom, (2) Ground water encountered between 5 feet and 30 feet below the tank bottom, and (3) Ground water encountered at greater than 30 feet below the base of the tanks.

Case 1: (Ground water less than five feet below base of tank)

If ground water is encountered less than five feet below the bottom of tanks one groundwater monitor well per tank shall be installed on the downgradient side based on professional judgment. In the case when multiple storage tanks are placed side by side, the monitor wells shall be distributed along the perimeter of the tank cluster at approximately equal spacing.

Case 2: (Ground water between 5 to 30 feet below tank bottom)

If ground water is encountered at less than 30 feet but greater than 5 feet below the base of the tanks, a combination of vadose (unsaturated) zone and groundwater monitoring shall be used. Two (2) groundwater monitor wells shall be placed on the estimated down groundwater gradient side of the storage tank cluster, as based upon professional judgment, or at opposite ends of the tank cluster. In addition to the groundwater monitoring, two (2) vadose monitoring devices shall be installed. This monitoring device shall be located within ten feet of the storage tank. The monitoring requirements for a single underground tank shall differ from a cluster of tanks in that only one (1) groundwater and one (1) vadose monitor device shall be installed on the estimated down groundwater gradient side of the tank, as based on professional judgment.

Case 3: (Ground water at greater than 30 feet below tank bottom)

If a boring is extended to a depth of 30 feet below the bottom of the tank and no ground water is encountered, two vadose zone monitor devices will be used for each tank cluster. The vadose monitor devices will be located as close as feasible to the tank cluster and on opposite ends of the tanks.

The monitoring requirements for a single underground tank shall differ from a cluster of tanks in that only one (1) vadose monitor device shall be installed adjacent to the lowest point of the tank.

Installation Procedures

At those sites where the precise depth to ground water is not known, the procedure is to drill a hole in the natural formation within ten feet of the storage tank down to ground water or to a maximum depth of 30 feet below the base of the tank(s). The hole is to be placed on the estimated down groundwater gradient side of the storage facility, as based upon professional judgment. All borings are to be carefully logged and soil samples collected. Soil samples are to be obtained, starting at the bottom of the tank and every five feet to the water table.

All soil samples are to be described using the Unified Soil Classification system. Visual, olfactory, and/or tactile evidence of soil contamination are to be recorded on the log description.

If the boring fails to encounter ground water within 30 feet from the base of the tanks, the excess hole will be backfilled with concrete to five feet beneath the tank bottom. A vadose monitoring device will then be completed in the remainder of the borehole. The sampling ports of the vadose monitor device shall be completed in unsaturated materials within five feet beneath the tank bottom or at the base of the backfill materials.

When groundwater is encountered, the drilled hole will be extended into the uppermost water-bearing zone an amount sufficient to allow for seasonal groundwater fluctuation. A boring completion depth of 20 feet below the groundwater surface will be sufficient at most sites. Care should be taken during drilling so as not to breach a competent clay layer or aquitard. A competent aquitard shall be regarded as a low-permeability continuous layer of material with sufficient thickness to readily prevent the rapid vertical migration of fluids.

If groundwater wells are installed to monitor motor fuel storage tanks and/or waste oil tanks, the critical interval to monitor is the air-water interface. If groundwater levels fluctuate seasonally or on a long term basis, the screened interval of the monitor well must be necessarily larger to accommodate these variations. For the purposes of this monitor program, the screened interval shall extend ten feet above and 20 feet below the static fluid level unless local conditions or minimum annular seal dictate a change. At facilities that require vadose monitor devices, the perforated interval of casing shall be five feet in length and completed within five feet beneath the tank bottom or at the base of the tank backfill material.

Monitoring Requirements

Once the monitoring systems are installed at each site, periodic vadose and/or groundwater sampling will be necessary. Groundwater sampling shall be performed on a monthly basis, starting upon completion of the installation. Groundwater sampling is to be accomplished by using a clear (transparent) plastic ball-valve bailer. The water sample may then be inspected for the presence of odor and the observance of product on the water. Vadose sampling shall be performed on a monthly basis. Several vadose sampling methods shall be allowed. These methods include soil pore fluid sampling and vapor sampling. The specific vadose sampling technology must be capable of detecting the material contained in the storage tanks.

LIST OF CHARGES

Equipment

Truck-mounted Hollow Stem Auger with Operator and Helper	$100.00 to $150.00/hr
Pumping Truck and Equipment	$600.00/day

Personnel Rates

Registered Professional	$60.00 to $100.00/hr
Engineer/Geologist	$40.00 to $60.00/hr
Technician or Aide	$30.00/hr

Materials

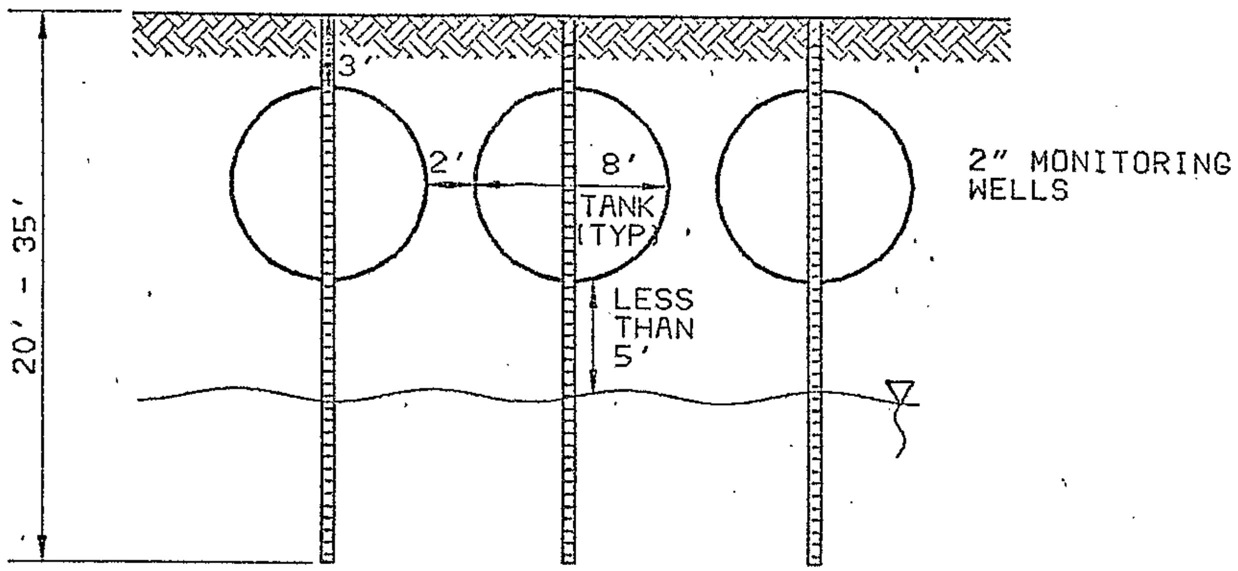
Slotted Casing (4-inch PVC)	$6.50/ft
Slotted Casing (2-inch PVC)	$4.50/ft
Solid Casing (4-inch PVC)	$5.00/ft
Solid Casing (2-inch PVC)	$4.00/ft
Annular Material (sand, grout, etc.)	$1.50/ft
Well Covers	$50.00 to $150.00/ea
Cement	$125.00/yd^3

Material Testing

Soil Analyses (EPA Method 602)	$50.00 to $150.00/sample
Vapor Analyses	$100.00/sample

CASE I

GROUND WATER LESS THAN 5 FEET BELOW THE TANK BOTTOM



GROUND WATER MONITORING SHALL BE INSTALLED WHEREVER GROUND WATER IS LESS THAN 5' BELOW THE TANK BOTTOM.

ONE WELL PER TANK ON THE DOWNGRADIENT SIDE.

WELLS TO BE MONITORED MONTHLY.

COST: $6,300 - $9,800
PER SERVICE STATION

G00056 (G05606) TWL 10/18/84

UNDERGROUND PETROLEUM STORAGE TANK
PROPOSED ALTERNATE MONITORING PLAN - INSTALLATION COSTS

CASE I (Ground Water less than 5 feet below tank invert)

Requirements:

- o Four groundwater monitor wells.
- o Three vadose monitor wells.

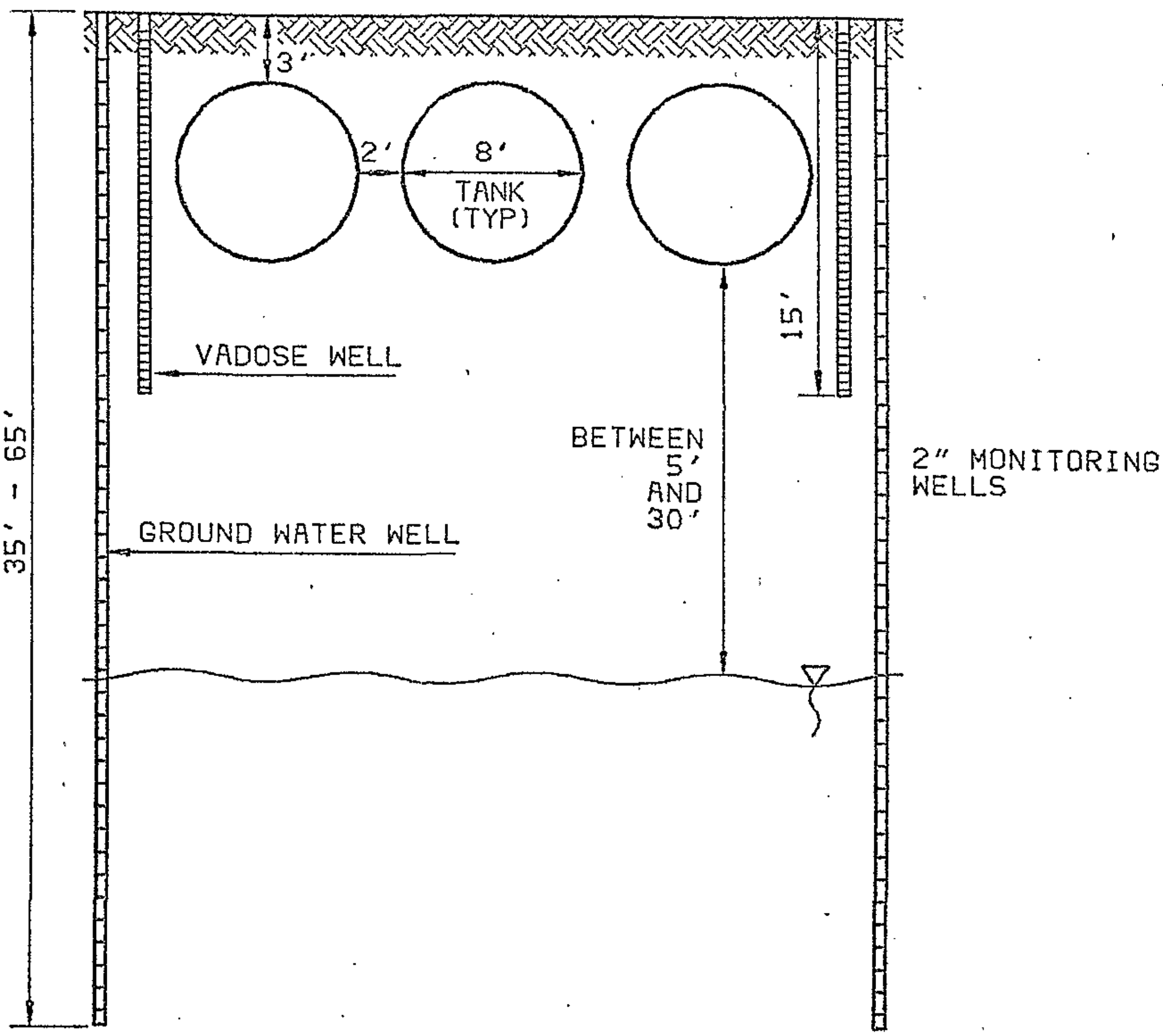
Itemized Costs:

Drilling	20 hours*	\$2,000 to \$3,000
Casing (2-inch PVC)	145 feet	\$635
Annular Material	145 feet	\$220
Well Covers	7 wells	\$350 to \$1,050
Registered Professional	4 hours	\$240 to \$600
Geologist/Engineer	32 hours	\$1,280 to \$1,920
Technician	12 hours	\$360
Well Development	1 day	\$600
Waste Removal	6 bbls.	\$180
Mobilization/Demobilization	4 to 8 hours	\$400 to \$1,200
	Total Costs**	\$6,300 to \$9,800

* Assumes No Difficulties During Drilling
** No Monitoring Equipment Included.

CASE II

GROUND WATER 5 FEET TO 30 FEET BELOW THE TANK BOTTOM



2 GROUND WATER WELLS AND 2 VADOSE WELLS PER TANK CLUSTER.

1 GROUND WATER AND 1 VADOSE PER WASTE OIL TANK.

WELLS TO BE MONITORED MONTHLY.

COST: \$7,100 - \$10,800
PER SERVICE STATION

G0005G (G05607) TWL 10/18/84

UNDERGROUND PETROLEUM STORAGE TANK
PROPOSED ALTERNATE MONITORING PLAN - INSTALLATION COSTS

CASE II (Ground Water 5 feet to 30 feet below tank invert)

Requirements:

- o Three groundwater monitor wells.
- o Three vadose monitor wells.

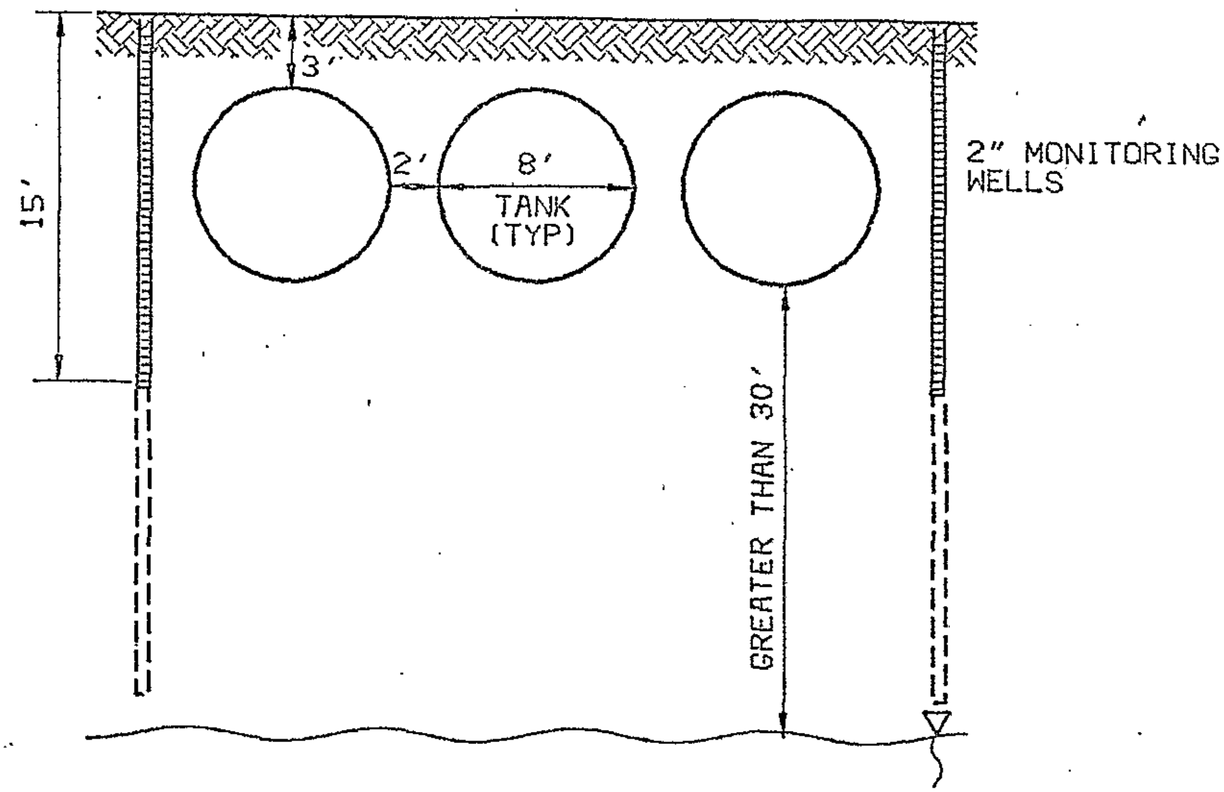
Itemized Costs:

Drilling	24 hours*	$2,400 to $3,600
Casing (2-inch PVC)	195 feet	$850
Annular Materials	195 feet	$290
Well Covers	6 wells	$300 to $900
Registered Professional	4 hours	$240 to $600
Geologist/Engineer	36 hours	$1,440 to $2,160
Technician	12 hours	$360
Well Development	1 day	$600
Waste Removal	8 bbls.	$250
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Costs**	$7,100 to $10,800

* Assumes No Difficulties During Drilling
** No Monitoring Equipment Included.

CASE III

GROUND WATER GREATER THAN 30 FEET BELOW THE TANK BOTTOM



EXPLORATORY BORINGS SHALL BE DRILLED TO DETERMINE GROUND WATER DEPTH.

2 VADOSE WELLS PER TANK CLUSTER.

1 VADOSE WELL PER WASTE OIL TANK.

WELLS TO BE MONITORED MONTHLY.

COST: $4,200 - $6,800
PER SERVICE STATION

G00056 (G05608) TWL 10/18/84

UNDERGROUND PETROLEUM STORAGE TANK

PROPOSED ALTERNATE MONITORING PLAN - INSTALLATION COSTS

CASE III (Ground Water greater than 30 feet below the tank invert)

Requirements:

- Three vadose monitor wells.
- Three exploratory borings.

Itemized Costs:

Drilling	16 hours*	$1,600 to $2,400
Casing (2-inch PVC)	45 feet	$190
Annular Materials	120 feet	$180
Well Covers	3 wells	$150 to $450
Registered Professional	4 hours	$240 to $400
Geologist/Engineer	24 hours	$960 to $1,440
Technician	12 hours	$360
Waste Removal	5 bbls.	$160
Mobilization/Demobilization	4 to 8 hours	$400 to $1,200
	Total Costs**	$4,200 to $6,800

* Assumes No Difficulties During Drilling

** No Monitoring Equipment Included.

#54 MODERN WELDING CO
4141 N BRAWLEY AVE
FRESNO, CA 93711

OCT. 23, 1984

STATE WATER RESOURCES BOARD
P.O. BOX 100
SACRAMENTO, CA
ATTN: MR. HAROLD SINGER, DIV. OF TECHNICAL SERVICES,

REF: 23 CAC SECTION 2610-2704

DEAR MR. SINGER

WE BELIEVE SOME ADDITIONAL DEFINING OF SECTION 2632 PARA (G) IS REQUIRED TO PROTECT THE CUSTOMER.

SINCE MODERN WELDING STARTED BUILDING STEEL CLAD WITH GLASS FIBRE REINFORCED PLASTIC IN THE EARLY 60's WE HAVE 10 YEARS EXPERIENCE ON ANY OTHER MANUFACTURE OF THIS TYPE OF TANK. WE BELIEVE ALL TANKS OF THIS CATEGORY SHOULD BE TESTED AT THE JOBSITE WITH A 35000 VOLT HOLIDAY TESTER AND PROVED HOLIDAY FREE.

THIS IS BROUGHT ABOUT BECAUSE WE RECENTLY TESTED ONE OF OUR NEW COMPETITORS TANKS IN THIS FIELD AND FOUND OUT THEIR TANKS HAD VOIDS or HOLES IN THE FIBERGLAS AT A 35,000 VOLT TEST AND THEN A 10,000 VOLT TEST ALSO.

(Cont. on Page 2)

Modern Welding Co.

(cont from Page 1)

PLEASE CALL US IN REGARDS TO THIS MATTER AS THE CONSUMER DEFINITELY NEEDS PROTECTION

Sincerely

Richard J. Reisz

RICHARD J. REISZ
ASST. MGR. - FRESNO

PHONE 800-742-1838
209-275-9353

#55

ADVANCED
INDUSTRIAL
DESIGNS INC.

October 22, 1984

State Of California
Water Resources Control Board
Division of Technical Services
901 P St.
Sacramento, Ca. 95814

Dear Sirs:

I would like to take this opportunity to commend those members of the Board actively engaged in writing the Regulations Draft. Efforts to safeguard the environment are long overdue.

There are several areas of pertinent technological advancements in which I have aquired expertise. For the past two years I have been investigating vadose vapor sensing technologies. Although my investigations centered on hardware development, I have aquired significant insight into sub-surface hydrocarbon transport phenomenon.

Attached are copies of four Investigations which are consistant in their findings. These investigations contain consistant data which will corroborate all stated comments.

The Investigations are:

1. "Soil Sentry Effectiveness in Controlled Soil Conditions"--- Advanced Industrial Designs Inc.
2. "A Monitoring and Removal Program for Leaked Propane Gas in the Vadose Zone"--- Geriaghty and Miller
3. "Demonstration of Soil Gas Sampling as a Tool to Aid in Defining the Distribution of Subsurface Contamination by Volatile Organic Compounds" ---Glenn M. Thompson Ph.D.
4. " Soil Gas Studyof Volatile Organic Contaminents above a portion of the TCE Contaminated Aquifer" ---Dr. Glenn M. Thompson

Same rpt.

Comments are referenced by the pertainent section number of the Draft Regulations.

2640,c

should be in P 4.4

Expensive analytical and slant drilled samples of a site are not necessary. Vadose investigations would reveal accurate site history.

2642, f

should be in P 4.60 .62, .63

A Leak of .05 gph should not be tolerated. The currently used test procedures are conducted over much too short a time span.

CONTINUED

ADVANCED
INDUSTRIAL
DESIGNS INC.

Should be in P.4A 2644,a
Same comment as 2640,c
2645, b, 2
The five feet constraint on Vadose monitoring feasibility is not necessary. All investigations to date demonstrate that P 4.140 the effectiveness of aspirated Vadose monitoring systems increases as the water table rises. This increase is independent of soil composition.
2646, d
P4.140 Same comments as 2645, b, 2

If I can be of any further service, please do not hesitate to contact me.

Sincerely,

Reinhard Hanselka

Reinhard Hanselka
President and Principle Engineer

33 COTTINI WAY, SANTA CRUZ, CA 95060 • (408) 425-5895

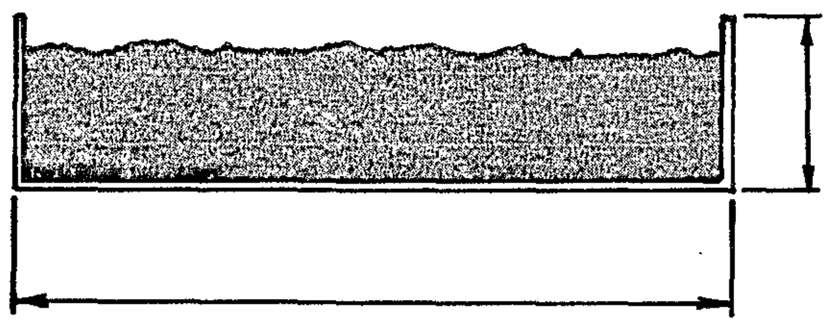
ADVANCED INDUSTRIAL DESIGNS
33 Cottini Way
Santa Cruz, CA 95060
(408) 425-5895

GENELCO

SOIL SENTRY

A. The purpose of this investigation is to determine the effectiveness of the device in a controlled soil condition.

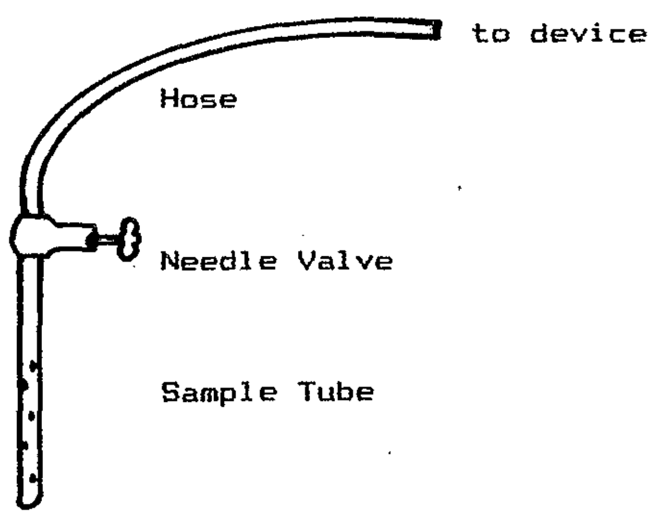
B. Apparatus and test procedure



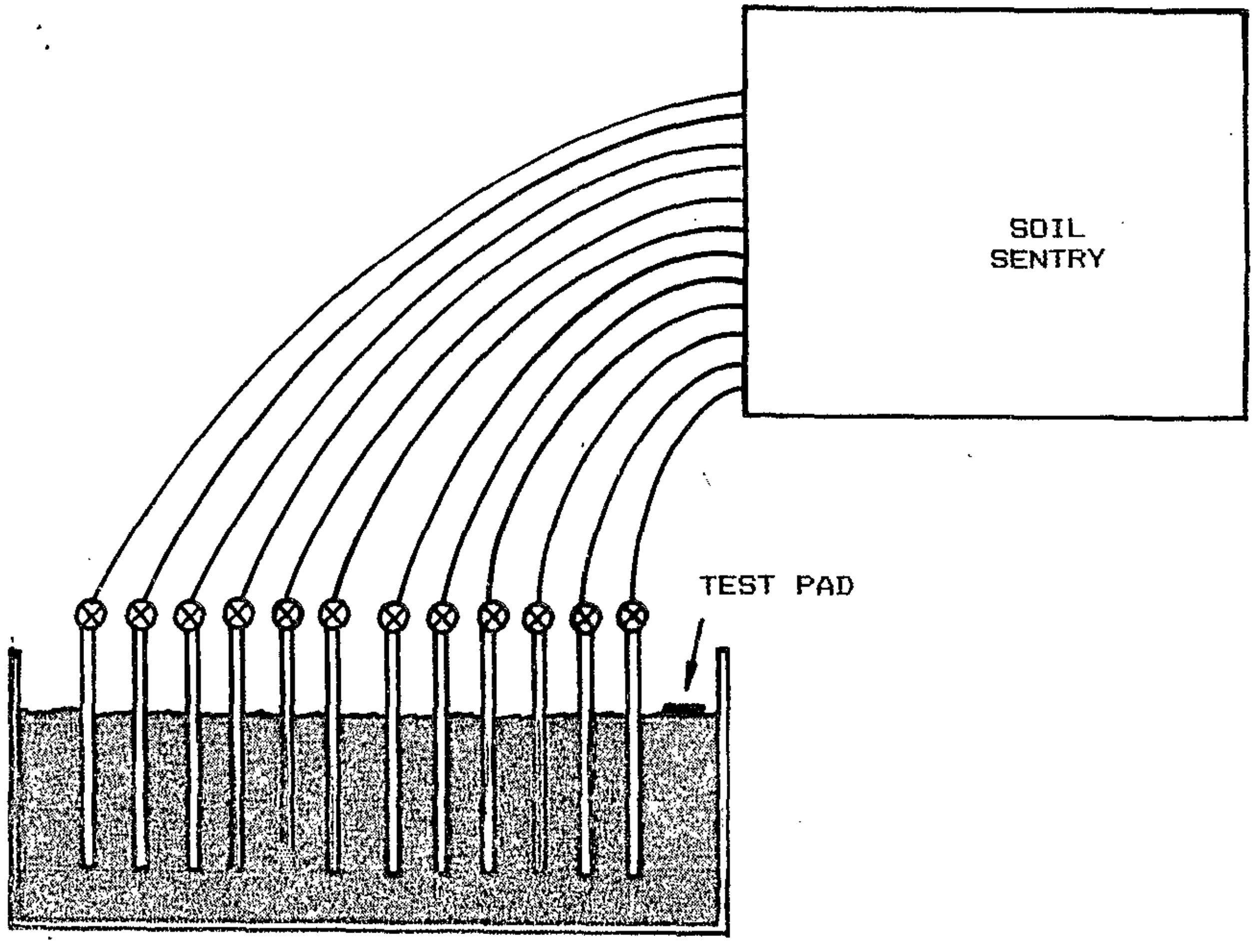
Test Box

4' x 1' x 1'

5/8 plywood



C.



1. Soil

   a. 50% clay
      50% sand
         at 15% moisture ?
            50% moisture
               saturated at water table

2. Chemicals

   a. Acetone
   b. Gasoline (reg)
   c. Gasoline (unlead)
   d. Methylene Chloride
   e. Tri-chloroethylene (TCE)

3. Temperature

   45 deg. F - 78 deg. F

4. Procedure

   a. Soil was renewed after each chemical test.
   b. Sensor was initiated.
   c. 10 ml of test solution was placed on the test pad.
   d. Test completed when all sensors register leak or 5 days.

ADVANCED
INDUSTRIAL
DESIGNS
33 Cottini Way
Santa Cruz, CA 95060
(408) 425-5895

5. Data

a. 15% moisture — Acetone

Day 1 - Initiation & sample placement
Day 2 - Sensors 1, 2, 3, 4
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Day 5 - -------

b. 50% moisture — Acetone

Day 1 - Initiation
Day 2 - Sensors - all
Day 3 - -------
Day 4 - -------
Day 5 - -------

c. 15% moisture — Gasoline (reg)

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Day 5 - -------

d. 50% moisture — Gasoline (reg)

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3, 4
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7,
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Day 5 - -------

e. 15% moisture — Gasoline (unlead)

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Day 5 - -------

f. 50% moisture — Gasoline (unlead)

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3, 4, 5
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Day 5 - -------

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g. 15% moisture — Methylene Chloride

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3, 4
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Day 5 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

h. 50% moisture — Methylene Chloride

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3, 4, 5
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Day 5 - -------

i. 15% moisture — TCE

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3, 4
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7
Day 4 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Day 5 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

j. Sample tube material was changed from PVC to PVDF due to compatability problems with Methylene Chloride.

k. Water table saturated — Gasoline (unleaded)

Day 1 - Initiation
Day 2 - Sensors 1, 2, 3, 4
Day 3 - Sensors 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Day 4 - -------
Day 5 - -------

6. Conclusion

Device performed as claimed. Sensitivity was equal with all solvents triggering response.

Robin Hasse

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Soil-gas technique is not used as a leak detection technique

A MONITORING AND REMOVAL PROGRAM FOR LEAKED PROPANE GAS IN THE VADOSE (UNSATURATED) ZONE: A CASE STUDY*

Thomas Lobasso, Jr. and Andrew J. Barber
Geraghty & Miller, Inc., Syosset, New York

The loss of petroleum products through leaking tanks and distribution systems is one of the most common and widespread occurrences of subsurface contamination in the United States. Many of these incidences are spotlighted by the media and draw much public attention. Although many types of product recovery systems have evolved, earth scientists would agree that even the most advanced systems cannot remove all of the product trapped within the soil grains or rock fractures. Problems can occur due to lighter fractions separating from residual product, causing accumulations of vapors in the subsurface. Increased attention is being turned toward the role of gases in the unsaturated zone in incidents of hydrocarbon contamination. The following case history details the techniques used to delineate and remove a body of gaseous hydrocarbons from the unsaturated zone.

Field Investigation

Two leaks from a buried natural gas distribution system resulted in gas plumes under a residential area. The gas, predominantly propane, spread through an unsaturated zone composed of unconsolidated glacial materials and reach the water table where some of the gas dissolved in the ground water. Approximately one and a half years after the discovery and

*Proceedings from The Conference on the Characterization and Monitoring of the Vadose (Unsaturated) Zone: National Water Well Association: December 1983, Las Vegas, Nevada.

repair of the major leak, a subsurface investigation was begun utilizing specialized sampling procedures and protocols to determine the extent and dynamics of the plume in both the saturated and unsaturated zone. The results of the investigation revealed the second leak and were later used to design and implement a gas removal program.

A propane monitoring program in the vadose zone was initiated based on several assumptions; (1) propane has a greater density than air, 1.83 grams at 25°C and one atmosphere, and would migrate downward from the pipeline leak (4 feet below land surface) until it reached the saturated zone, (2) propane with an aqueous solubility of 65 mg/L (Merck, 1960), would dissolve into the ground-water system as the gas plume made contact with the water table, and (3) the remaining undissolved gas would blanket the water table surface. Presumably, propane gas can move in either direction between the saturated and unsaturated zones, depending on the relative concentrations in each zone.

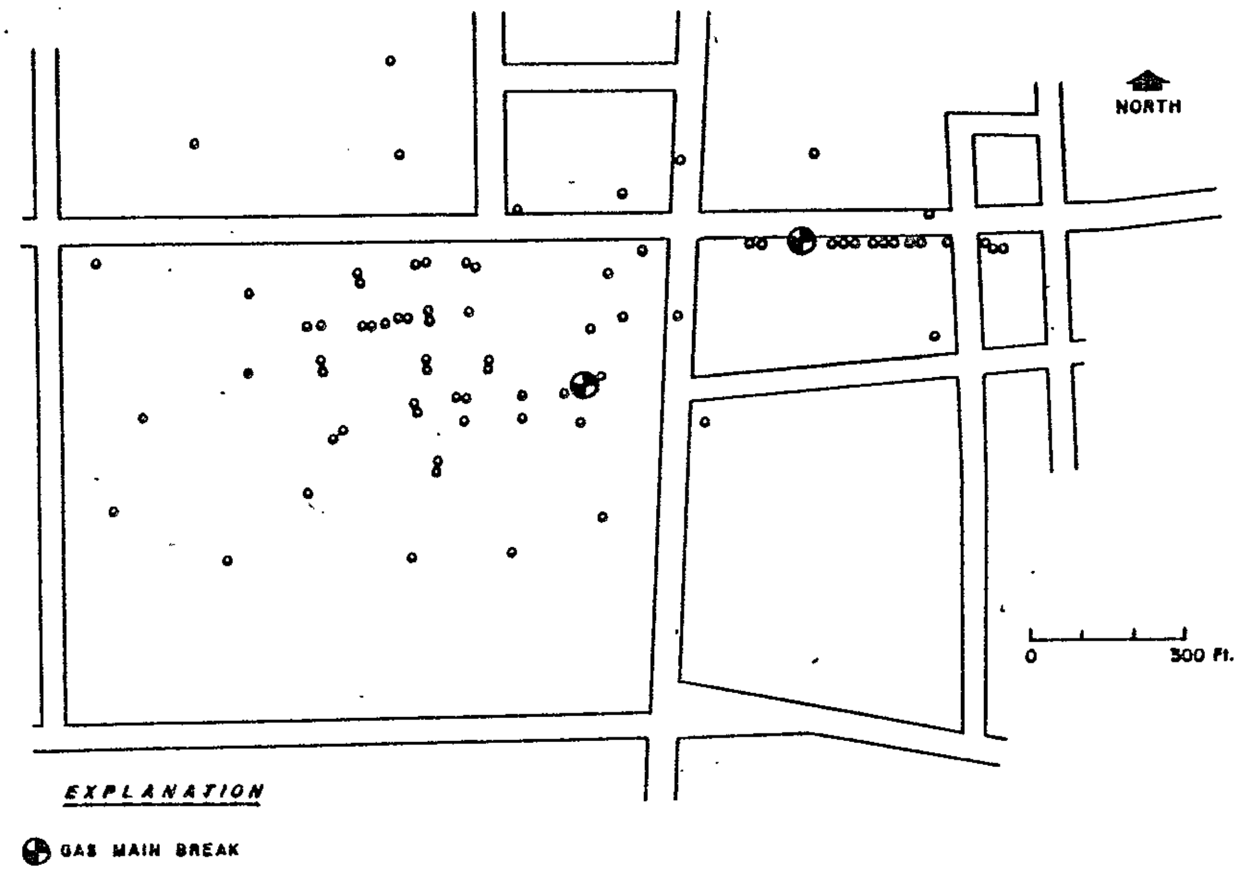
Saturated Zone Investigation

A field investigation of the saturated zone was first undertaken to determine the extent of the dissolved propane in the ground-water system. The ground-water investigation, which continued concurrently with the investigation of the unsaturated zone, included the installation of monitoring wells designed to provide (1) geologic information, (2) ground-water samples to determine the impact of dissolved propane on the ground-water system and to approximate the location of the gaseous propane (undissolved) within the unsaturated zone, and (3) water levels to determine local hydraulic gradients and general direction of ground-water flow. Gas chromatographic analyses of ground-water samples collected from the monitoring wells indicated the general extent of propane contamination in the saturated zone. These results in turn provided the rationale for the location and design of gas monitoring wells in the unsaturated zone.

Unsaturated Zone Investigation

The investigation in the vadose zone began with the installation of 20 small-diameter wells screened directly above the water table. After samples of the soil atmosphere (soil-air samples) were collected and analyzed, it was apparent that additional monitoring points would be required to further define the extent of gaseous propane in the subsurface. Figure 1 shows the location of the propane-monitoring wells as well as the location of the gas-main leaks. To monitor the presence of gaseous propane vertically within the soil profile, well clusters (two or more adjacent wells screening successive depths) were installed at some of the locations. The vertical monitoring data was necessary to later maximize the removal of gas during the cleanup phase.

The monitoring wells were installed by the air rotary drilling method and were constructed of 2-inch (I.D.) PVC casing and screen. To install well casings and screens an oversize diameter borehole (6-inch) was first drilled. The drill cuttings were collected at 5-foot intervals and logged for geologic interpretation. Once the desired depths were reached, the well casing and screen was installed. The annular space surrounding the well screen was backfilled with graded sand slightly larger in grain size



LOCATION OF PROPANE MONITORING WELLS

Figure 1

than the screen openings (0.02 inches) to prevent fine soil particles from entering the well. The space directly above the screened interval was filled with bentonite clay and cement to seal the well and prevent surface runoff from entering.

One quarter-inch (I.D.) tubing was installed in each well which extended downward into the well screen approximately two-thirds the distance from ground surface to the water table. The tubing protruded through an air-tight well cap at ground surface and was used for collection of soil-air with vacuum equipment.

During early phases of the field investigation, it was necessary to have real-time analyses of hydrocarbon content in soil gases. The immediate results helped to guide the drilling program, and allowed us to establish a protocol for gas sampling once the wells were in place.

The two instruments used for this work were an organic vapor analyzer (OVA) and an explosimeter. The OVA is a portable instrument that can measure hydrocarbons in air in the range of 0.2-1,000 parts per million (vol./vol.). The explosimeter is less sensitive; it measures gas as a percentage of the lower explosive limit (LEL) and percent by volume. The explosive limit of propane is 2.37 to 9.5 percent by volume in air (Merck, 1960).

Monitoring wells and borings to be sampled were left closed and undisturbed for at least 24 hours. At the time of sampling, a diaphragm pump or peristaltic pump was connected to the 1/4-inch (I.D.) polyethylene tubing that is permanently in place and extends downward to the sampling zone.

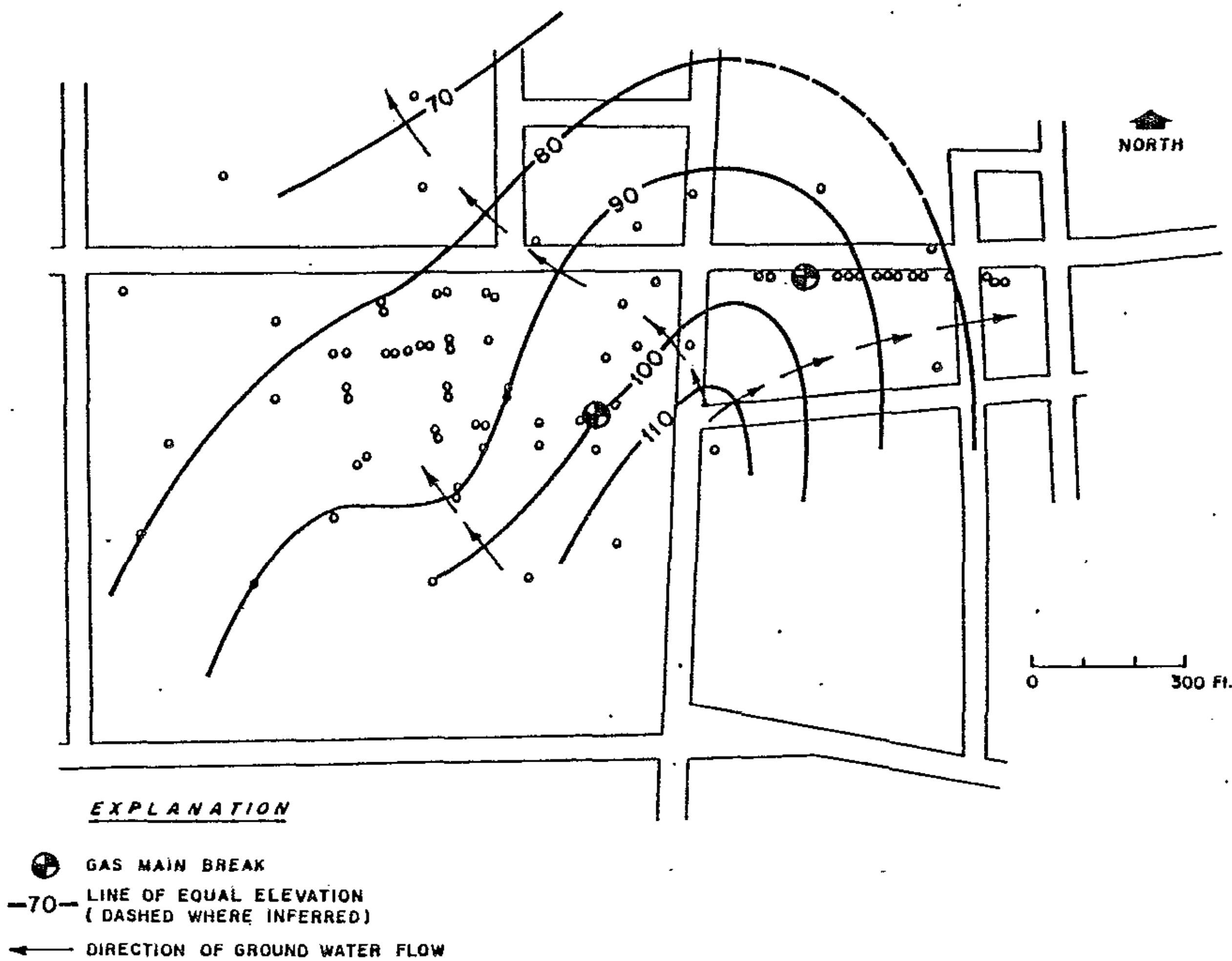
Field experiments with the OVA showed that a constant hydrocarbon reading occurred after five minutes of pumping at approximately one liter per minute. Subsequently, all routine samples were taken into air bags after removal of several liters of gas. The pump was disconnected after sampling and allowed to flush with fresh air.

Results of the Hydrogeologic Investigation and Soil-Air Sampling Program

The study area is underlain by 50 to 100 feet of unconsolidated glacial material, consisting of till with occasional stratified and unstratified silts, sands, and gravels. These deposits are underlain by crystalline bedrock.

The water table occurs within the unconsolidated deposits at depths ranging from 20 to 30 feet below land surface. The surface of the water table slopes northward and eastward, generally conforming to the topography of the area (Figure 2). Ground water in the water-table zone moves in a northern and eastern direction.

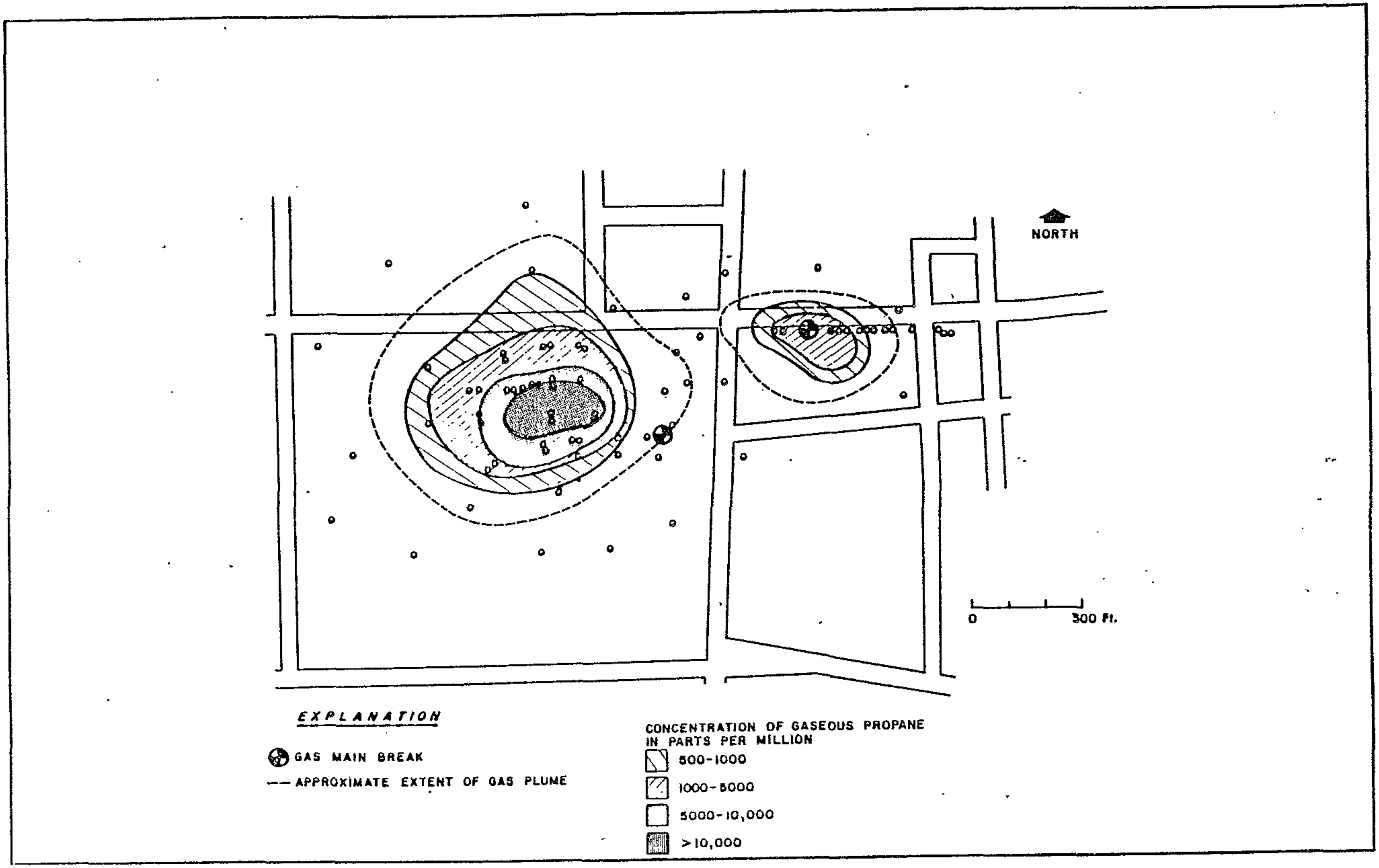
The results of propane analyses in soil-air samples from the vadose zone are shown in Figure 3. Propane plumes resulted from gas main breaks at the two locations shown. This figure shows propane concentrations of samples drawn from wells that are screened in the middle and lower part of the unsaturated zone (15-30 feet). Concentration contour lines have been superimposed on the study area.



WATER TABLE CONTOURS

(Feet above mean sea level)

Figure 2



CONCENTRATION OF PROPANE IN THE MIDDLE TO LOWER UNSATURATED ZONE (15'-30')
(BEFORE GAS REMOVAL OPERATIONS)

Figure 3

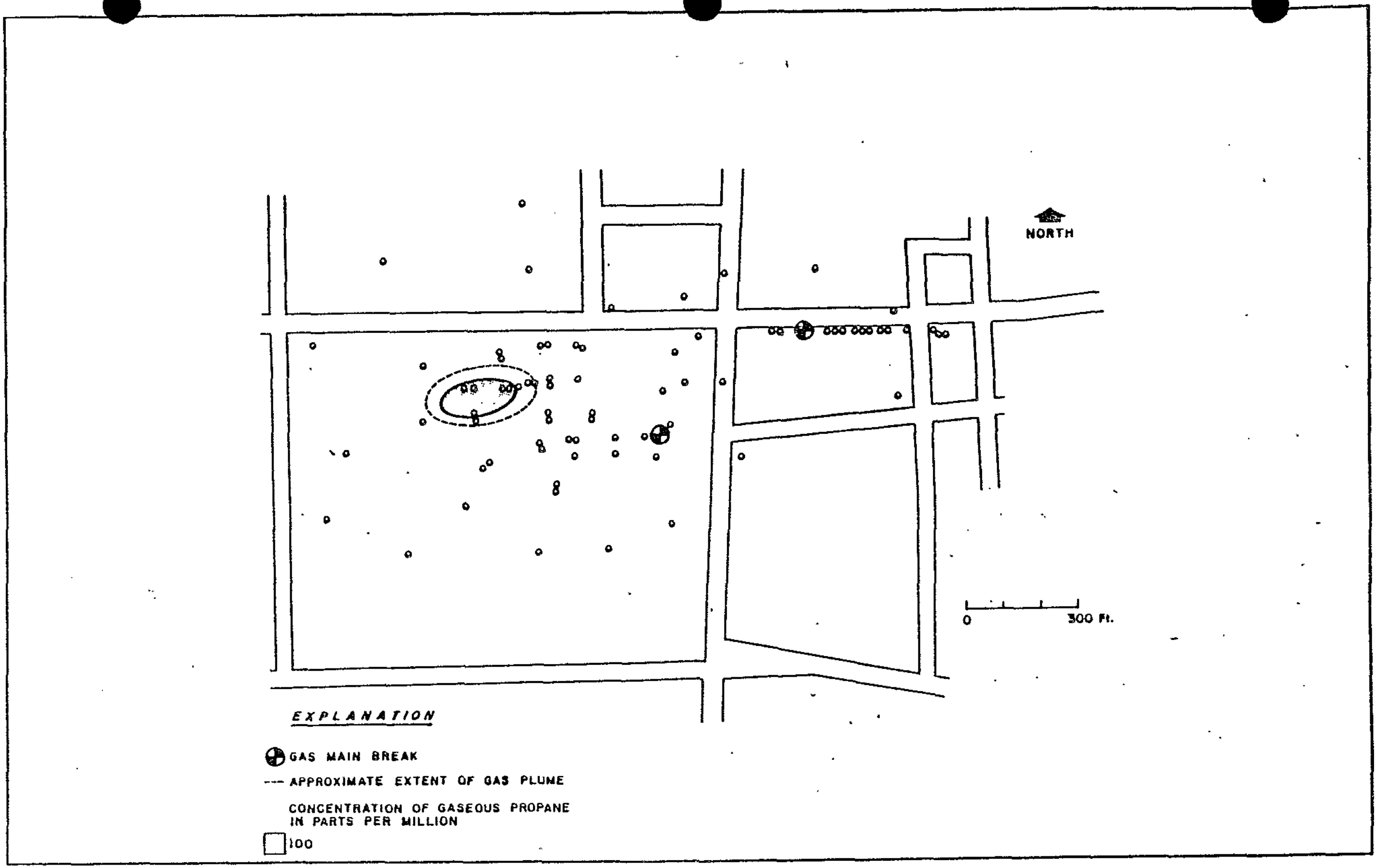
Propane concentrations in soil-air samples collected from wells screening the upper to middle unsaturated zone during the same time are shown on Figure 4. Comparison of Figure 3 and Figure 4 shows that the propane in soil-air is predominantly in the deeper part of the unsaturated zone.

It was noted that the area of highest concentration of propane (>10,000 ppm (vol./vol.)) in the larger plume was 200 feet north and downgradient from the gas main break indicating that the gas had migrated from the point of origin. Neither dissolved nor gaseous propane was detected in the subsurface at monitoring points upgradient from the known source. It should be noted that the smaller plume is still centered on the second gas main break, indicating that this break occurred more recently and the gas had not yet migrated. In fact, the second gas main leak had remained undetected until our soil-air survey had been completed.

Propane Removal Program

Before a full-scale gas removal system was initiated, several pilot studies were conducted to determine if propane could be removed from the vadose zone, and if so, how effectively. A plan was developed to utilize vacuum through the monitoring wells to evacuate the gas plume.

After researching several recovery methods, such as attaching small vacuum devices (diaphragm and peristaltic pumps) to the wells, the most feasible and effective method appeared to be the use of aspiration devices or eductors. Eductors could easily be attached to the wells and moved to



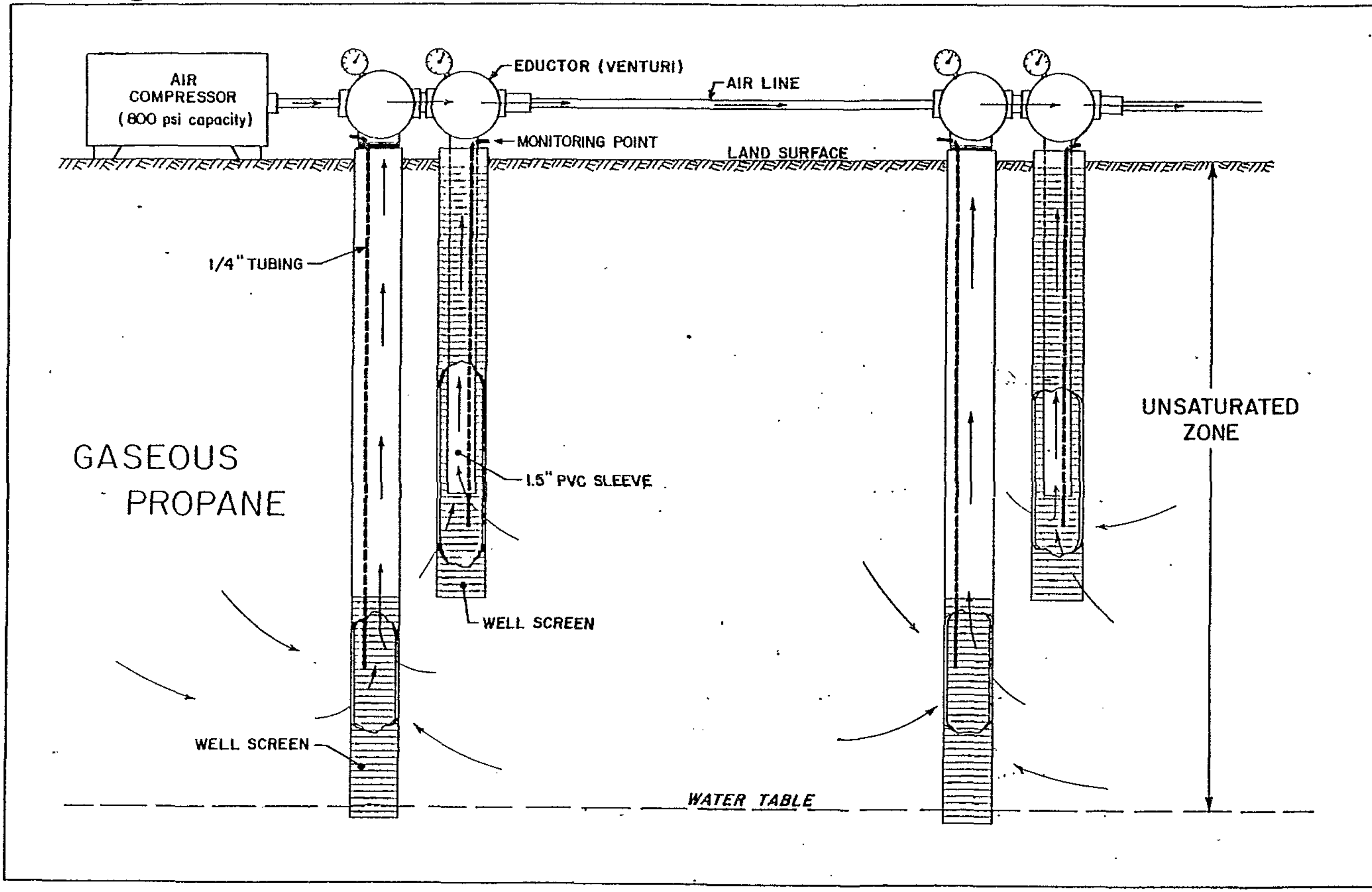
CONCENTRATION OF PROPANE IN THE UPPER TO MIDDLE UNSATURATED ZONE (0'–15')
(BEFORE GAS REMOVAL OPERATIONS)

Figure 4

other wells, if necessary, and several (up to 10) could be connected to one air compressor and operated at the same time. Figure 5 shows the propane removal system in a cross-sectional view. Compressed air passing through the venturi produces a vacuum inside the well casing and draws gases out of pore spaces of the unsaturated soils. The gases are evacuated from the ground and discharged into the atmosphere. The high rate of discharge from the air compressor was expected to dilute the propane to concentrations below 5 percent of the LEL.

Pumping tests were conducted to determine the change in propane concentrations over time in the removal wells and in nearby observation wells. The system was alternately pumped for 24 hours and then shut down for 24 hours to allow propane concentrations to reach equilibrium in the well casing. Soil air samples were collected and analyzed by gas chromatography before each pumping cycle began. Results of the pumping test showed a decline to 10 percent of the original propane levels after the first 48-hour cycle. Propane concentrations were observed to rise to 50 to 70 percent of their original levels by the end of the 4th to 6th pumping cycle, then decline after subsequent pumping cycles. Similar trends were observed in observation wells surrounding the pumping wells. This information indicated that the gas plume is highly mobile in the subsurface and that it was possible to remove propane, if only locally, by aspiration.

A full-scale recovery program began with the addition of recovery wells in areas of highest propane concentration. These wells, along with existing monitoring wells within the plume, were fitted with venturi de-



CROSS-SECTIONAL VIEW OF PROPANE REMOVAL SYSTEM

Figure 5

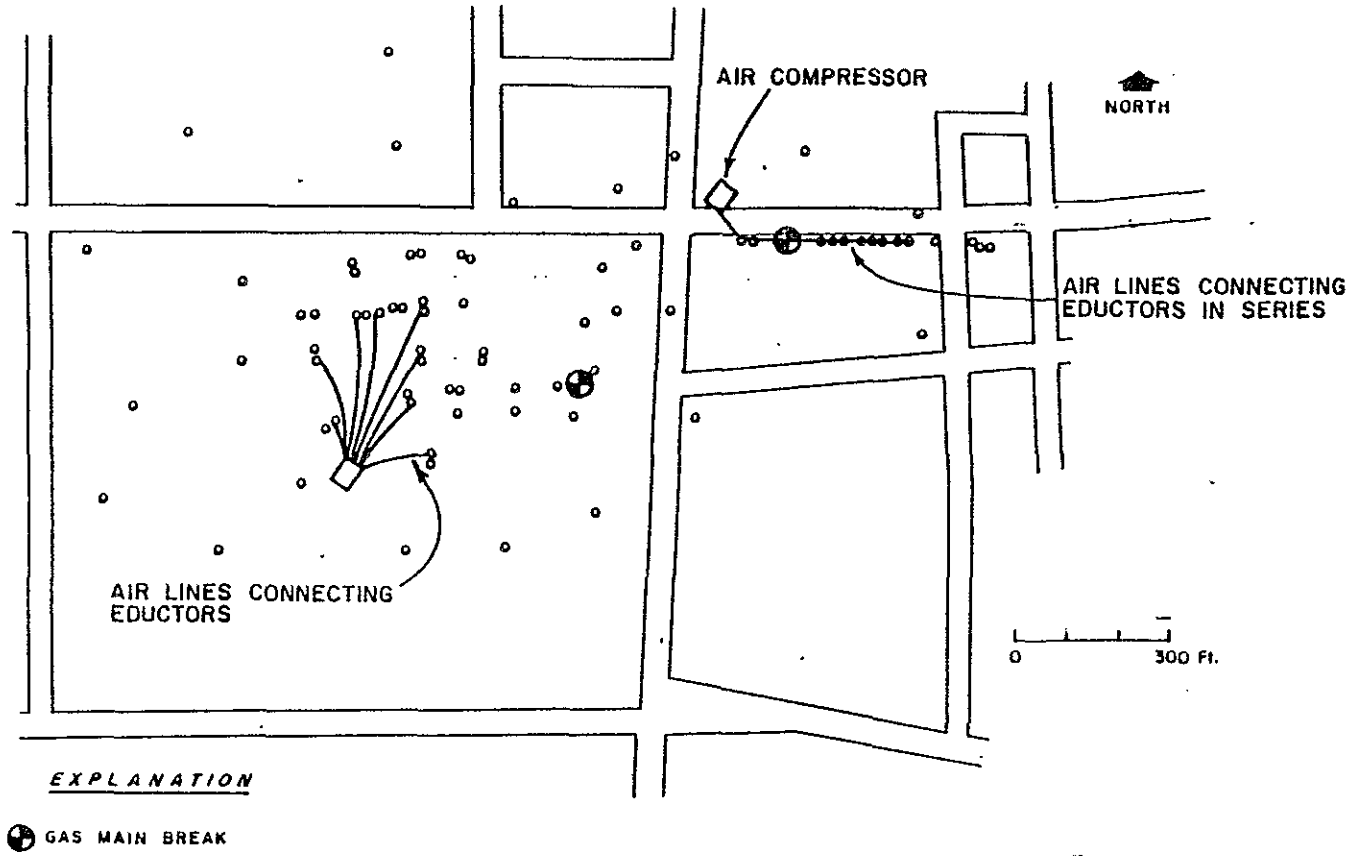
vices and connected in series or independently to a single air compressor. Figure 6 shows the airline configuration. Pressures of 50 to 90 pounds per square inch were maintained at each well head causing the pressure in the well casing to decline to approximately 0.98 atmospheres. The system was operated 12 hours per day for 6 days a week and was allowed to recover for 48 to 72 hours every two weeks so that a round of soil-air samples could be collected and analyzed to monitor removal progress. The results of these analyses indicated that the recovery system decreased the overall concentration of propane in the subsurface. After three months of aspiration, concentrations were reduced to trace amounts.

Summary and Conclusions

The tested propane gas which is heavier than air, traveled downward through the unsaturated zone until reaching the water table. A portion of the gas dissolved into the saturated zone but the bulk of the remaining gas blanketed the lower portion of the vadose zone 15-30 feet below land surface.

The major gas plume traveled 200 feet downgradient from the gas main break between the time the leak was repaired and the subsurface investigation began (approximately 1-1/2 years). A smaller gas plume was discovered near a second gas main break which had remained undetected until the time of the subsurface investigation.

The results of a study to determine the extent of propane in the saturated zone were helpful in "fingerprinting" the extent and location of the



TYPICAL AIR LINE CONFIGURATIONS USED DURING THE PROPANE REMOVAL PROGRAM

Figure 6

gas plume in the unsaturated zone and formed the basis for the design and location of gas removal wells.

Pilot testing of specialized gas sampling methods and protocols was carried out to insure that soil-gas samples were representative of actual conditions in the unsaturated zone and that consistent and reproducible analytical results were obtained.

As a safety precaution it was necessary to continuously monitor propane in the atmosphere during all phases of the field investigation and cleanup operation. Several explosimeters and organic vapor analyzers were helpful in this regard.

Reference

Merck & Company, Inc., 1960; The Merck Index of Chemicals and Drugs, pp. 859.

SOIL GAS STUDY OF VOLATILE ORGANIC CONTAMINANTS ABOVE A PORTION OF THE TCE CONTAMINATED AQUIFER IN THE SOUTHWEST PART OF TUCSON, ARIZONA

BY

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MARCH 8, 1983

DEMONSTRATION OF SOIL-GAS SAMPLING AS A TOOL TO AID IN DEFINING THE DISTRIBUTION OF SUBSURFACE CONTAMINATION BY VOLATILE ORGANIC COMPOUNDS

BY

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AUGUST 16, 1983

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ABSTRACT

An investigation of volatile organic contaminants in the unsaturated zone soil gas above a known TCE contamination plume was conducted in Tucson on February 2, 1983. The purpose of the study was to test soil gas sampling as an investigative technique for subsurface contamination problems and test methodology for performing gas sampling.

Halocarbons were measured in the atmosphere above ground, in the soil gas at depths of 10, 20, 50, and 90 ft below land surface, and in the groundwater at the site. Seven compounds were measured. TCE, CCl_4, PCE, and CCl_3H showed gradients that increased in concentration toward the water table, indicating a subsurface or water-table source. F-11, TCA, and methylene chloride showed decreasing concentration with depth indicating a possible atmospheric origin.

All of the compound detected in the soil gas at 10 ft were detected in the groundwater as well at 100 ft proving the basic value of the method for remote detection of groundwater contamination. If horizontal and vertical gradients are measured, the method can provide information about source and proximity of contamination.

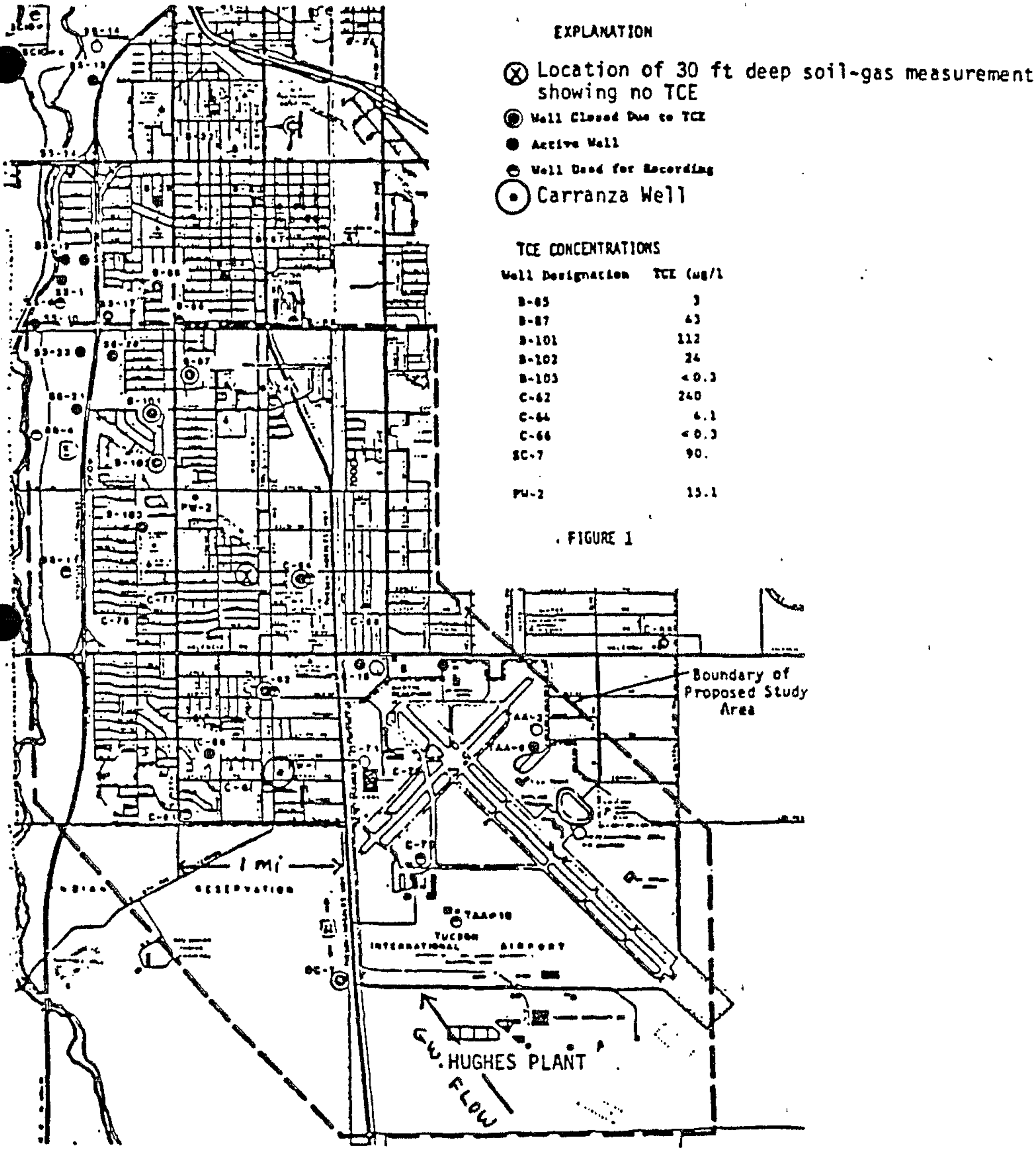
An experiment to investigate the concentration of volatile halocarbons in the soil gas above a portion of the TCE contaminated Tucson aquifer was initiated on February 2, 1983. The purpose of the experiment was to learn what factors affect the soil-gas concentration of a contaminant emanating from the water table and to evaluate methods of sampling the soil gas and groundwater. Soil-gas sampling is potentially the best investigative technique for volatile organic compounds in groundwater because of the low cost and speed of the measurement in comparison to drilling to the water table for each data point.

LOCATION

The site is located at the Carranza residence at 7019 South 6th Street in Tucson. The property is directly downgradient (northwest) of the Hughes Aircraft Company plant (Figures 1 and 2) which is known to be a major source of TCE contamination in the groundwater. There is a domestic well on the property contaminated with over 500 ppb of TCE indicating that the Carranza property is over the contaminated groundwater plume. Because of the proximity of the site to the contamination source, it is logical that the TCE has moved under the study area with the groundwater flow and has diffused upward from the water table through the soil in the gas phase.

FIELD SAMPLING METHOD

Soil gas is collected from a drive-point screen driven or buried in the ground at the desired depth. The gas is collected by pumping the soil gas out of the ground and through a sample container by means of a vacuum pump (Figure 3



TCE CONCENTRATIONS

Well Designation	TCE (ug/l
B-85	3
B-87	43
B-101	112
B-102	24
B-103	< 0.3
C-62	240
C-64	4.1
C-66	< 0.3
SC-7	90.
PW-2	15.1

Figure 1. Map showing contaminated wells in southwest part of Tucson and locatio[n] of study site (Carranza well) relative to Hughes Plant, a known source of TCE contamination in the groundwater.

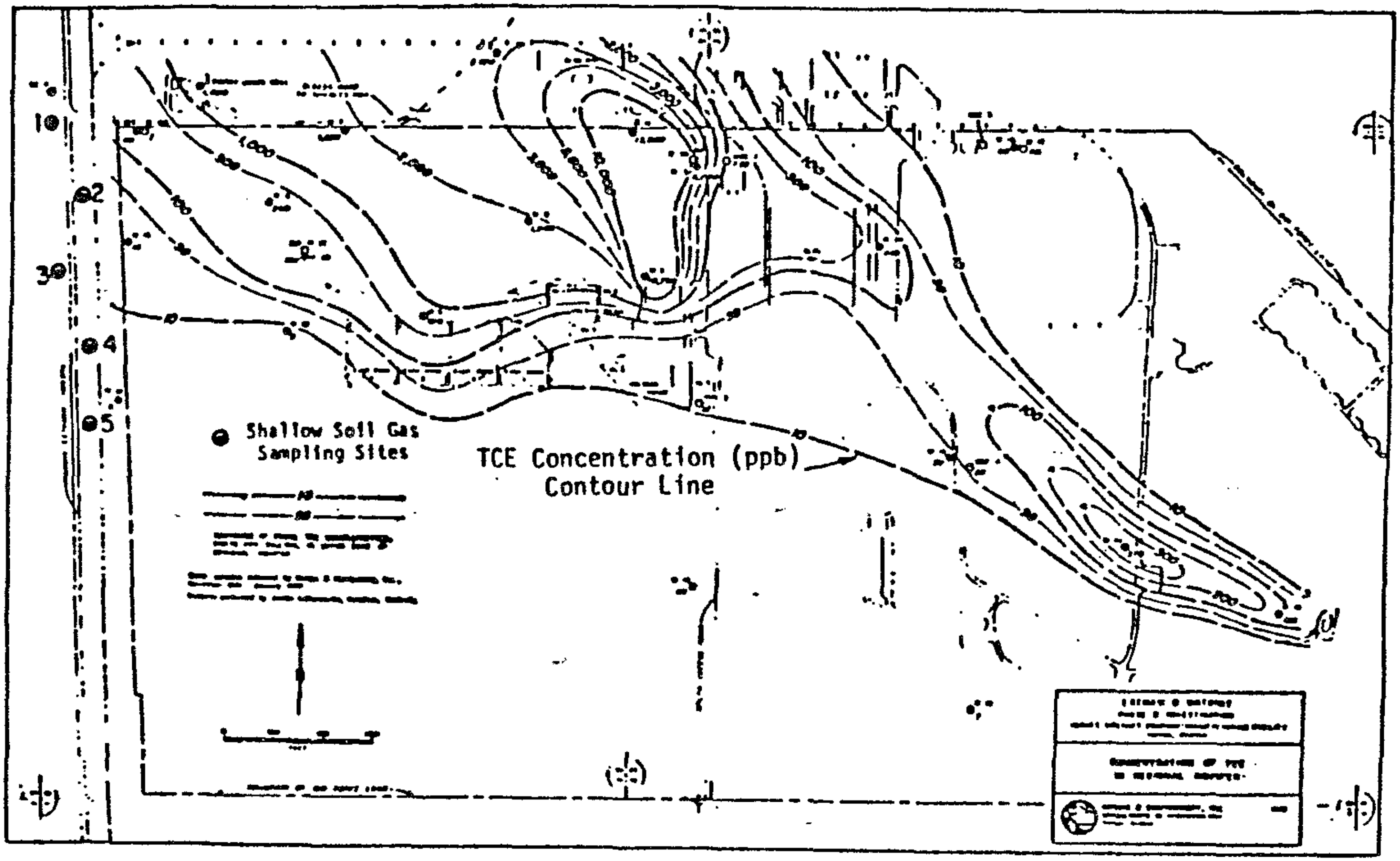


Figure 2. Map showing TCE plume originating from Hughes Plant.

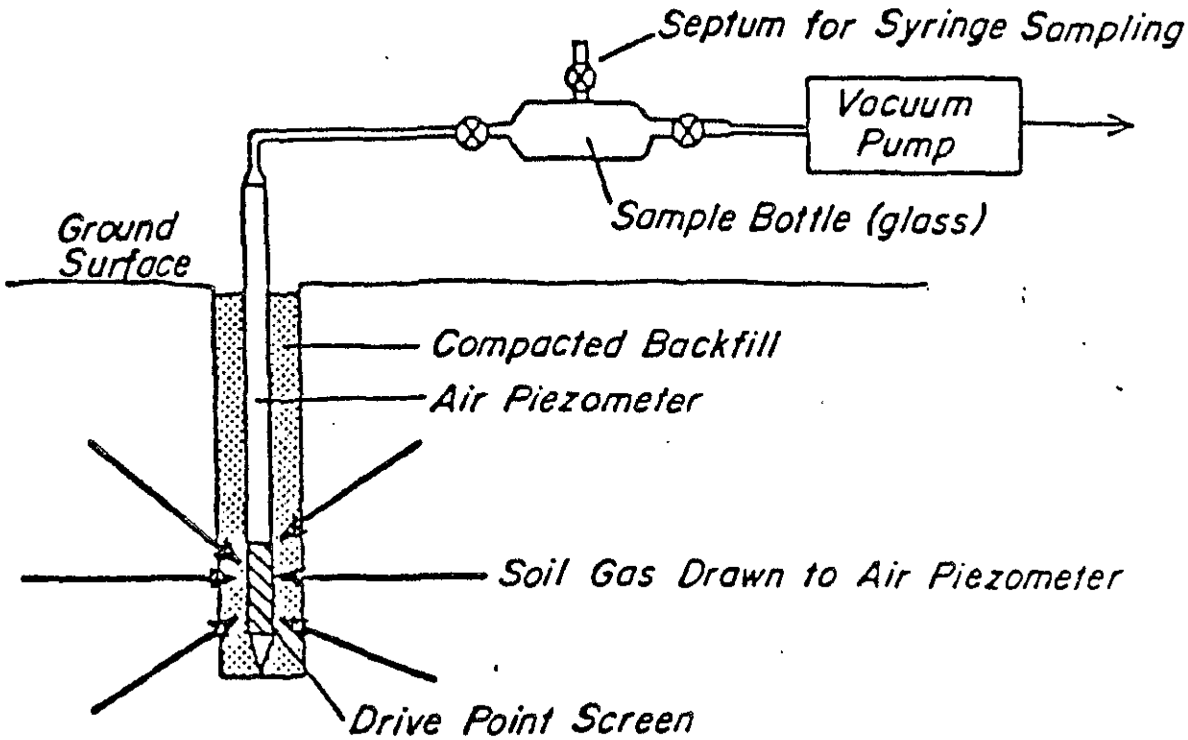


Figure 3. Schematic drawing of soil-gas sampling system.

A gas sample is periodically collected in a syringe from the sample bottle in the evacuation line and analyzed in the field. The field analysis is critical to the method in order to determine when a representative sample has been obtained and to direct the investigation as it progresses.

A hollow stem auger was used to drill the access hole. Soil-gas samples were collected at various depths through an air piezometer lowered down the center of the auger. Generally, the work proceeded as follows. The auger hole was advanced to the desired depth, and the air piezometer which consisted of a standard 30" drive-point screen on 1-1/4" steel pipe was lowered to the bottom of the hole and either driven with a 150 lb hammer or backfilled to bury the screen in the bottom of the hole. Burying the screen by driving it was initially assumed to be the best approach. This approach rarely worked, however. Oftentimes rocks prevented the screen from being driven more than a few inches. In the clayey soils where the screen would drive easily, no air could be drawn through the screen because all of the holes were effectively clogged with clay. In one instance where the screen was driven, the steel pipe broke while it was being pulled back out. The backfilling method was generally more successful. This entailed refilling the hole with drill cuttings to a depth of about five ft above the top of the screen, and pressing the soil down around the screen with the vertical hydraulic drive mechanism of the auger.

Water sampling was attempted with a positive displacement, low-volume sampling pump. The sampling pump which is 1.5 inches in diameter fit easily down the center of the auger flights. The pump, however, would not function properly in the extremely muddy water inside the auger tube. Essentially, the only water sample collected came up inside the drive-point sampler after it had penetrated the top foot of the water table. This was considered to be the most important sample for this study because of our particular interest in collecting water from the top of the water-table surface.

After the piezometer was in place, the soil gas was pumped at 5 to 20 L/min for a period of 30 to 50 minutes with analyses being made as frequently as possible during this period. The series of measurements were needed to determine if uncontaminated air was being drawn into the sample from above ground. If surface air is being drawn down the borehole, the contaminant concentration will show a decrease after about five minutes of pumping when the surface air reaches the piezometer screen. If there is no open connection to the surface, the concentrations will remain constant for at least 50 minutes of pumping. Two examples that illustrate the behavior described are given below:

SAMPLE A		SAMPLE B	
3.9×10^{-3} µg TCE/L	7 minutes	3.3×10^{-3} µg TCE/L	5 minutes
2.3×10^{-3} µg TCE/L	18 minutes	3.3×10^{-3} µg TCE/L	11 minutes
2.9×10^{-3} µg TCE/L	30 minutes	3.5×10^{-3} µg TCE/L	25 minutes
2.4×10^{-3} µg TCE/L	40 minutes	3.5×10^{-3} µg TCE/L	40 minutes
		3.4×10^{-3} µg TCE/L	55 minutes

Sample A, soil gas collected at a depth of 25 ft below ground shows air leakage down the borehole. Sample B, soil gas collected from a depth of 50 ft in the same location using the technique described above, represents a sample collected with no air leakage, thus the contaminant level remained nearly constant for the entire sampling period. This ability to know if air is being drawn from above is extremely important to the problem of collecting meaningful data in vadose gas sampling programs because undetected air leakage can easily cause 100% error in a sample measurement.

All of the TCE measurements were made in the field using conventional laboratory equipment mounted in a vehicle and operated from a generator. A Varian 3700 series gas chromatograph and Hewlett Packard integrator were the principal equipment items. The gas chromatograph was modified with a Nafion tube dryer to remove water, thus allowing direct injection of either soil gas or water. The practical detection limit for TCE by this method is 0.1 μg/L in water or 1×10^{-4} μg/L in soil gas. The analysis time is the same for either water or soil gas typically taking about ten minutes if no more than five to ten compounds are present in the sample. Figures 4, 5, and 6 show representative chromatograms of soil gas, air, and groundwater, respectively.

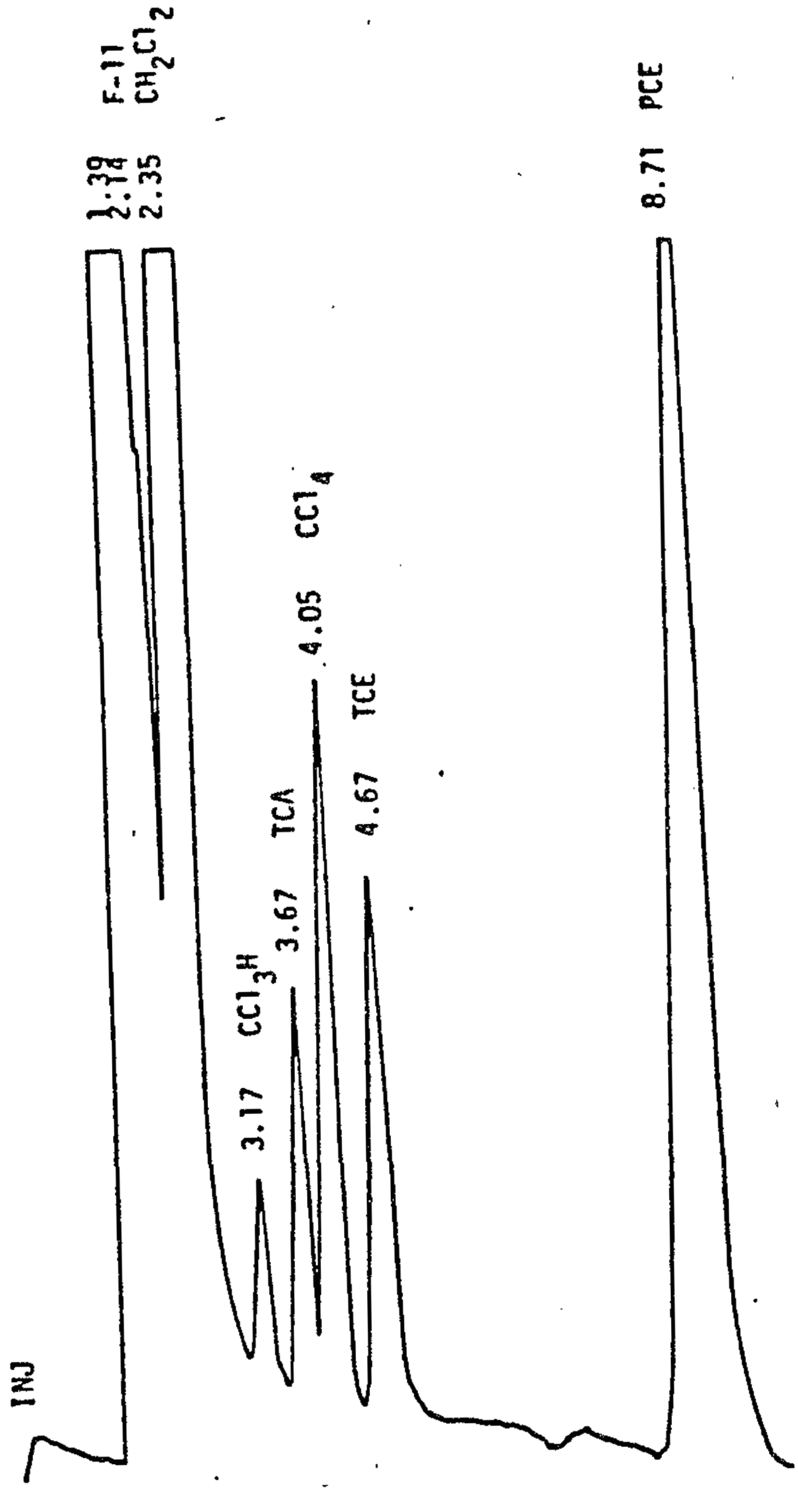


Figure 4. 2 cc soil gas from 25 ft horizon, 2/2/82, Carranza property.

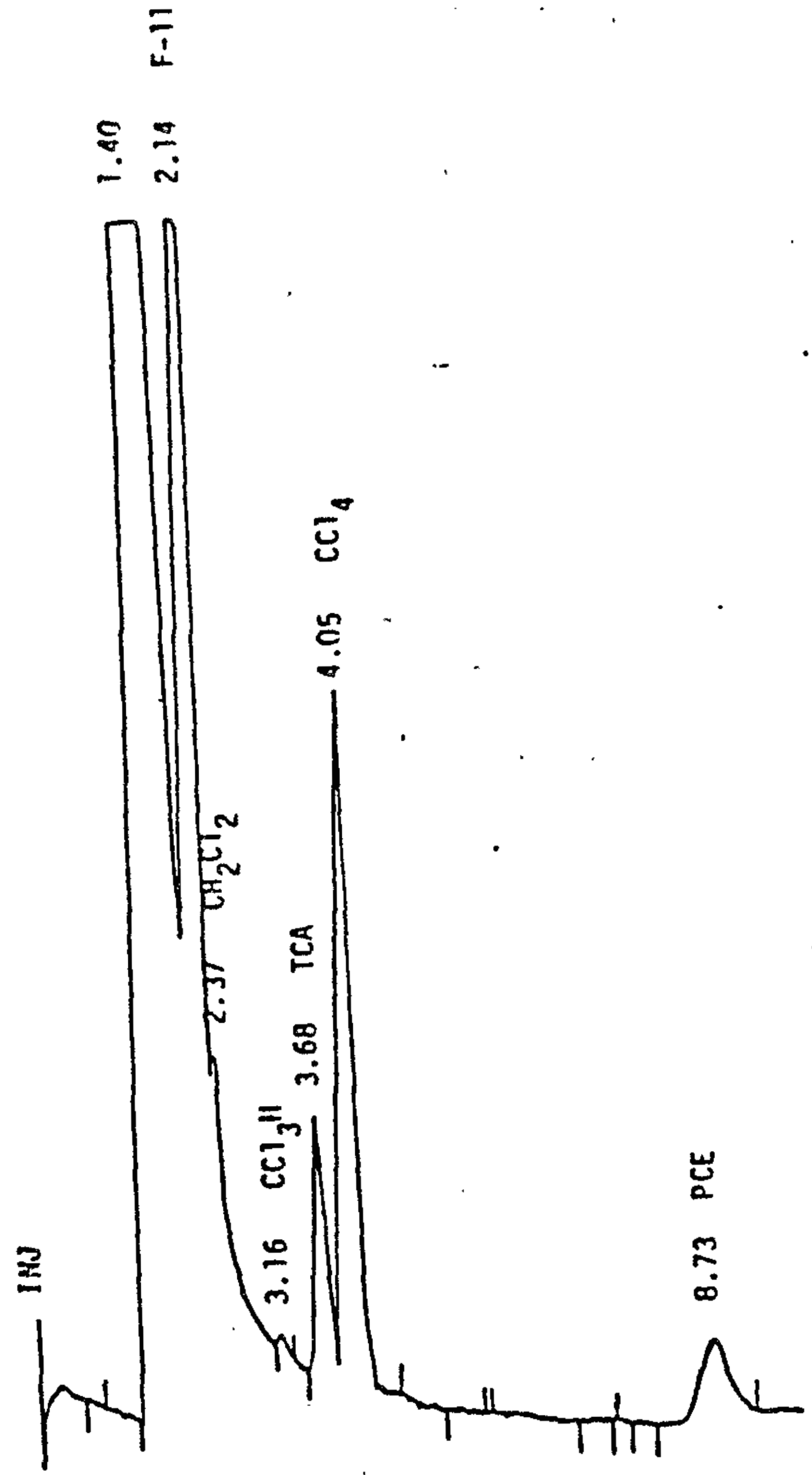


Figure 5. 2 cc air above ground, 2/2/83, Carranza property.

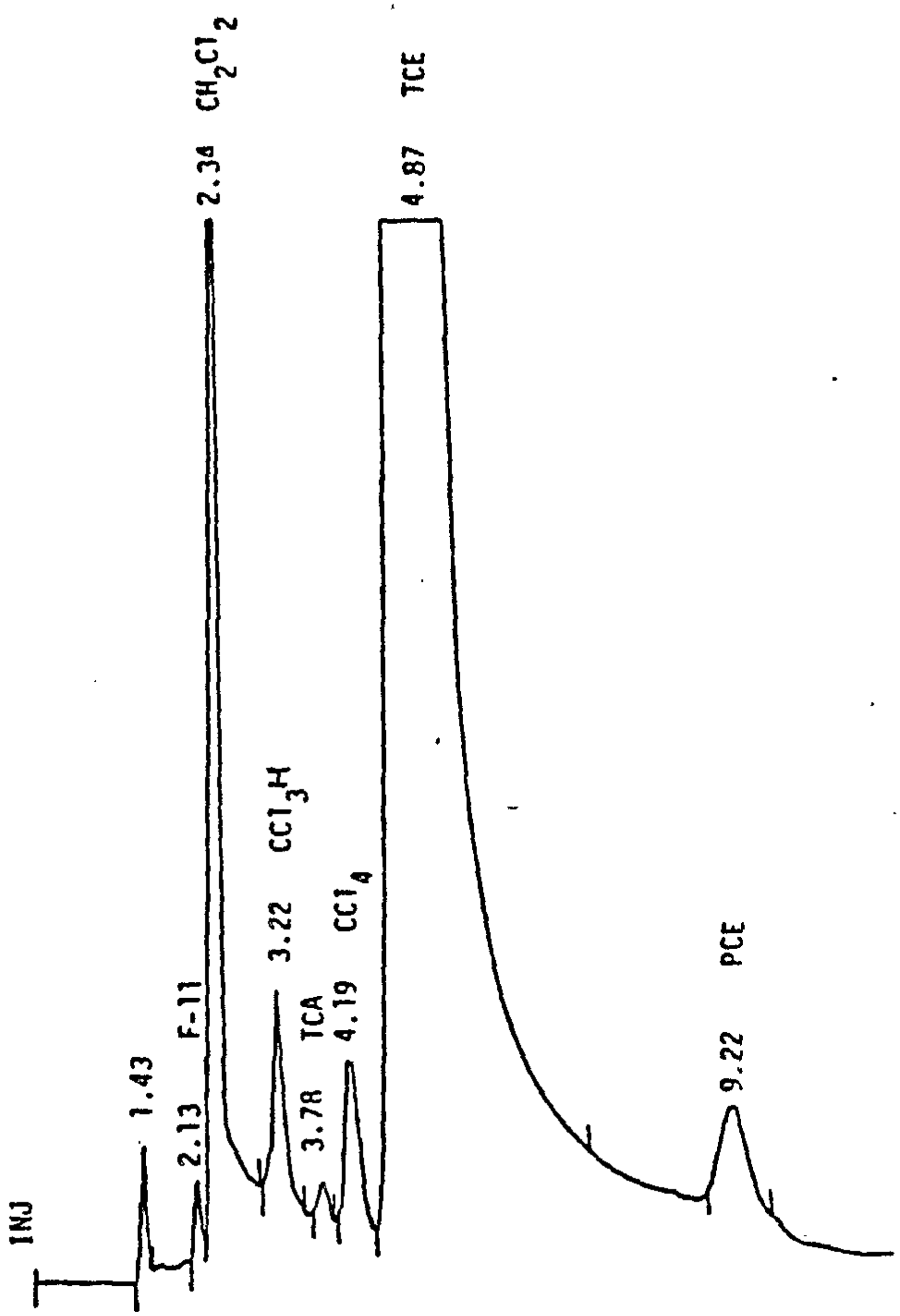


Figure 6. 5 µL water from Carranza well, 3/7/83.

RESULTS AND DISCUSSION

Seven compounds were identified in the soil gas and in groundwater. These were:

trichlorofluoromethane (F-11)
methylene chloride (CH_2Cl_2)
chloroform (CCl_3H)
1,1,1 trichloroethane (TCA)
carbon tetrachloride (CCl_4)
trichloroethylene (TCE)
perchloroethylene (PCE)

The approximate depth and concentration observed for these compounds in the soil gas and in the groundwater are given in Table 1.

In the case of CCl_3H, CCl_4, TCE and PCE, the concentration increased with depth down to the water table. For F-11, TCA, and CH_2Cl_2, the reverse trend was observed, the soil-gas concentration was greatest near the surface. The contamina concentration from two samples of groundwater is provided in Table 1. The first sample "water table surface" is water that was bailed from the first water to flow into the auger hole. The Carranza well is a domestic well (about 300 ft away) that intercepts approximately the upper six ft of the water table. Both samples are included for comparison. The "Carranza sample" is probably a better representative of the local water but the "water table" sample is probably a better sample for comparing relative concentrations of contaminants across the surface of the water table, i.e., the air-water partitioning coefficient undergro.

The data are most easily interpretable for TCE because the groundwater concentration is high enough to produce a strong gradient from the water table to the ground surface. There is no TCE in the atmosphere (free air) and the source is clearly from the groundwater. The partitioning coefficient, K_w

TABLE 1. Concentration data for atmospheric and subsurface ha... Carranza property, 7019 South 6th Avenue, Tucson, Arizona, February 2... 19...

#54 C

Richard Reisz
Modern Welding Company
2632 (c)(1)(A) Pages 3.12 & 3.13

I Don't Interrupt

? How do you visually inspect all exterior surfaces by direct viewing

Needs Clarification

1-18-85

Richard Reisz

	TCA	CCl_4	TCE	PCE
AIR ABOVE ...			-	0.00...
SOIL MATERIAL			0.006	0.01
			0.02	0.04
SILT, SAN... GRAVEL			0.03	1
CLAY			9	5
SAND SILT CLA...		...1	142	0.05
WATE... SU...		0.2	558	0.2
CAR... W...				

...deviation).

a

b

($K_w = \frac{\text{gas phase concentration}}{\text{aqueous concentration}}$), observed for TCE across the water-table surface is approximately 0.06. The equilibrium K_w measured in the laboratory in a sealed vessel containing only water and air is approximately 0.25. A lower K_w value would be expected in the field because of the problem of transporting the solute by diffusion through the aquifer material to the water-table surface where the gas-phase concentration is established. Thus equilibrium is probably never achieved, assuming that diffusion and escape through the unsaturated sediment is too rapid to allow the soil-gas concentrations to reach equilibrium above the water-table surface.

The other compounds that showed increasing concentration with depth in the unsaturated zone, chloroform, carbon tetrachloride, and PCE also appear to have a subsurface source. However, in these cases the groundwater concentration at the site appears not high enough to be the principal source for most of the gas observed in the soil. Lateral diffusion from a nearby higher contamination source is a more plausible explanation. Clearly, a horizontal gradient would have to be measured to determine if lateral diffusion was a principal factor in producing the gas concentrations observed. An influx of contaminated runoff int the subsurface from a nearby wash might also be a plausible explanation for the lower level contaminants observed at this site.

The F-11, TC4, and the methylene chloride showed decreasing concentrations with depth indicating an atmospheric source, yet the subsurface concentrations were higher than the concentrations in the atmosphere. This seemingly paradoxic situation occurs quite commonly for atmospheric halocarbons in the subsurface, often making their concentration in groundwater near recharge areas several tim higher than would be expected for water in equilibrium with the atmosphere from which they are derived. This phenomena has been demonstrated by Russell and

Thompson (1983) to occur naturally as a result of sorption-desorption mechanisms occurring in the three phase soil-water-air system. Even though the natural processes can be responsible for anomalously high halocarbon concentrations in groundwater, this mechanism should be invoked with caution in areas where subsurface dumping of contaminants has occurred.

CONCLUSIONS

In every case where halocarbons could be measured in the soil gas, they were detectable in the groundwater. In the case of TCE which showed high concentration in the groundwater, the soil-gas component appeared to be derived from the contaminated groundwater immediately below the sampling site. The groundwater appears to be the source because the concentration ratio measure between the soil gas and the water-table surface corresponded reasonably well to our expectations which are based on laboratory measurements of the gas/liquic partitioning coefficient, K_w.

For chloroform, carbon tetrachloride, and PCE, a subsurface source appears likely because the highest concentrations were measured near the water table but the groundwater immediately below the gas sampling location appears to be too low to be the main contributor of contaminants to the soil gas. Lateral movement in the gas phase from a nearby source could have produced the profile observed. More sampling locations along a horizontal transect would be needed to verify this hypothesis.

The ease of collecting soil-gas samples coupled with sensitivity of the measurement technique indicates that the gas sampling method will be useful in contaminant investigations. The method may provide a rapid survey technique for determining the approximate areal extent of a subsurface contamination problem. If the vertical and horizontal soil-gas profiles can be developed.

considerable information about the source of contamination may also be derived. The soil-gas measurement at the very least could provide a far more effective substitute for conventional "soil sampling" as a technique for locating volatile contaminants in the unsaturated zone.

RICHARD REISZ #54-8
MODERN WELDING Co.
2635(b)(4) PAGE 3.40

WE WILL AGREE WITH THIS PARAGRAPH AND THE ERRATA PROVIDED IT INCLUDES OUTER TANK ON DOUBLE WALL TANKS ~~1-18-85~~
insert after 1st comma in 1st sentence of ERRATA "AND THE OUTER SURFACES OF DOUBLE WALLED UNDERGROUND STORAGE TANKS CONSTRUCTED OF STEEL WHICH ARE NOT CLAD WITH GLASS FIBRE REINFORCED PLASTIC"

1-18-85
Richard Reisz

Russell, A... enrichment o... atmos... Resea... Water Resour...

#56

CALIFORNIA CATTLEMEN'S ASSOCIATION

TELEPHONE 444-0845 (AREA CODE 916)
1005 12TH STREET, SUITE A
SACRAMENTO, CALIFORNIA
ZIP CODE 95814

October 22, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95801

Dear Mr. Singer:

The California Cattlemen's Association, a statewide voluntary organization of beef cattle producers, appreciate the opportunity to comment on the proposed regulation governing underground storage of hazardous substance.

The suggested exemption language for farm storage of motor vehicle fuel, Section 2611(3), raises a serious question as to whether farmers and ranchers would be required to have two storage systems. One supply system for agricultural production use and another system for personal use.

By the very nature of their business, most ranchers and farmers use their motor vehicles for agricultural production and personal use. It is most common for them to use the vehicles to pick up parts and repairs and do personal shopping in the same trip.

The proposed exemption language also includes vehicles used in production at the farm site. Often farmers and ranchers have agricultural operations many miles removed from the farm site. Though the operation may not be a contiguous operation, the exemption should apply to the individual's total production agricultural operation.

We would strongly suggest that Section 2611(3) be amended to read as follows: "*Underground storage tanks that are located on a farm or ranch and store only motor vehicle fuel.*"

This language will simplify the exemption and will remove any need or potential for a dual storage system.

We would respectfully request that our suggestions be given favorable consideration.

Sincerely,

Leo L. Johnson

Leo L. Johnson
Assistant Manager

jh

Received DTS
OCT 22 1984

#57 HS

McCLOUD RIVER RAILROAD COMPANY

McCLOUD, CALIFORNIA 96057

P. O. Drawer A
Ph. (916) 964-2141

October 19, 1984

Mr. Harold Singer
Div. of Technical Services
P.O. Box 100
Sacramento, Ca. 95801

RE: Sher Bill - California Water Resources Control Board

Dear Mr. Singer:

Since I will be unable to attend the public hearing relating to regulations covering below ground level storage tanks for fuel, solvents, oil etc. I must enter my strongest protest herewith.

First - The industries and businesses that become involved by this regulation have been singled out and unfairly treated. Water quality is affected by other types of storage in underground tanks - namely septic tanks handle chemicals etc.

Secondly - Small tanks volumes less than 1,000 gallons should be excluded.

Third - The low volume customer in isolated areas where no water quality hazard exists.

Fourth - The regulations hold the presumption everyone is guilty and must prove their innocence before violations occur.

Yours truly,

Heraus
Vice-President Finance & Admin.

Received D...
OCT 22 1984

HS

#58

Mr. Harold Singer
Div. of Technical Services
P.O. Box 100
Sacramento, Ca. 95801

RE: Sher Bill - California Water Resources Control Board

Dear Mr. Singer:

Since I will be unable to attend the public hearing relating to regulations covering below ground level storage tanks for fuel, solvents, oil etc. I must enter my strongest protest herewith.

First - The industries and businesses that become involved by this regulation have been singled out and unfairly treated. Water quality is affected by other types of storage in underground tanks - namely septic tanks handle chemicals etc.

Secondly - Small tanks volumes less than 1,000 gallons should be excluded.

Third - The low volume customer in isolated areas where no water quality hazard exists.

Fourth - The regulations hold the presumption everyone is guilty and must prove their innocence before violations occur.

Yours truly,

[signature]

Squaw Valley Mo Ho & Trailer Park
P. O. Box 15
Colombero Drive & Grove St.
McCloud, Calif. 96057

Received DTS
OCT 22 1984

#59 HS

Phoenix & Son Garage & Storage Co.

P.O. BOX 751 • BAKERSFIELD, CALIFORNIA 93302 • (805) 831-8183

October 18, 1984

State Water Resources Control Board
P. O. Box 100
Sacramento, California 95801

Attention: Harold Singer
Division of Techinical Services

We are writing with great concern regarding the proposed underground storage tank leak monitoring regulations.

We would like to go on record as stating that these porposals are very extensive and as proposed would place a great cost burden on businesses and taxpayers alike. People proposing these regulations fail to realize these costs will have to be passed on to the consumer in higher prices on all commodities.

We agree that concern for the environment is needed, but the measures as proposed go beyond what is necessary to accomplish this objective.

We plan on attending this hearing to voice our opinions and objections.

Sincerely,

H. E. Phoenix, Jr.
President

HEP/ww

Received DTS

OCT 22 1984

H-S

#60

October 19, 1984

Harold Singer
Div. of Technical Services
P. O. Box 100?
Sacramento, Ca. 95801

Dear Mr. Singer:

Please be advised that we at Loomis strongly object to many of the regulations proposed by the new underground storage of Hazardous Substances Act as well as the unrealiztic inplimation date of July 1, 1985.

These regulations and the short amount of time allowed for compliance will prove a drastic financial burden on this as well as other individual Loomis Branch locations.

Sincerely,

Jan Marie Vasquez

Jan Marie Vasquez
Route Supervisor

JMV:mcv

Received DTS
OCT 22 1984

Original Comments 61-70

ERC
ENGINE RESEARCH CO.
584 EAST LEWELLING BLVD.
SAN LORENZO, CA 94580

OAKLAND, CA 946
PM
7 JAN
1985

USA 20c

State Water Resources Control Board
Paul R. Bonderson Building
Division of Water Quality
P.O. Box 100
Sacramento, Calif. -95801-0100

#61

HS

GLENN T. ROBINSON, INC.
SHELL OIL PRODUCTS JOBBER

(916) 241-2104
P.O. BOX R
REDDING, CALIFORNIA 96099

October 19, 1984

Mr. Harold Singer
Division of Technical Services
P.O. Box 100
Sacramento, CA 95801

Re: Proposed Regulations
Underground Storage of Hazardous
Substances

Dear Mr. Singer:

As a jobber of petroleum products, we supply fuel to many resellers and consumers in Northern California who own their own storage tanks.

We are very concerned with the potential impact of the California Resources Control Board's proposed regulations upon our customers and their capability to comply.

While we certainly are supportive of legislation that will assist in maintaining clean underground water, we strongly object to unrealistic requirements or regulations that exceed the intent of the Underground Storage of Hazardous Substances Act. To clean up prior or historical releases that may have been caused by prior owners, for example, is both unfair and unrealistic.

We are aware that at the upcoming public hearing scheduled for October 23rd, you will be receiving industry comments and expert testimony that will include realistic recommendations for the Board.

To establish regulations such as those presently proposed will not only create an unnecessary and costly financial burden upon those in the industry but upon the ultimate consumer as well.

We sincerely urge consideration of all aspects as the standards and procedures for underground storage are developed.

Yours very truly,

J. L. Salini

J. L. Salini
General Manager

Received DTS
OCT 22 1984

HS

#62

NEU BROS. GRADING & PAVING

1390 NORMAN AVENUE
SANTA CLARA, CALIF 95050
PHONE 988-4515
CONTRACTOR'S LICENSE NO 255472

October 18, 1984

Mr. Harold Singer
Division of Technical Services
P.O. Box 100
Sacramento, CA 95801

Subject: Adoption of proposed regulations governing underground storage of hazardous substances by the State of California Water Resource Control Board.

Dear Mr. Singer:

Neu Bros. is a small contractor in the grading and paving business. We have two small underground storage tanks that would fall under the proposed regulations. We have a few very serious concerns about the proposed regulations and have been advised to write to you to express those concerns prior to their enactment.

Firstly, we feel that the regulations should not go beyond the jurisdiction granted to The California Water Resource Control Board by Bill 1362 or its intent. In our opinion the proposed regulations go far beyond the jurisdiction intended by Bill 1362.

Secondly, we are very concerned about the potential financial impact of cleaning-up a "historical release." We are a small company, and a $100,000 to $200,000 cost might force us into bankruptcy. The cost would be particularly unfair in our case as the current ownership had no part in the original decision to install those tanks.

Neu Bros. is a concerned citizen and we do not want anybody to contaminate the underground water supply. However, the proposed regulations are not the way to solve the problem.

Very truly yours,

Daniel R. Henderson

Daniel R. Henderson
President

Received DTS
OCT 22 1984

ALL BIDS NOT ACCEPTED WITHIN 30 DAYS ARE SUBJECT TO REVIEW
IT IS ALWAYS OUR PLEASURE TO SERVE YOU

HS

#63

SILMAR

DIVISION OF SOHIO CHEMICAL CO.

P.O. Box 5006, Hawthorne, CA 90250-0590

October 18, 1984

Mr. Harold Singer,
Division of Technical Services
STATE WATER RESOURCES CONTROL BOARD
P.O. Box 100
Sacramento, CA. 95801

Gentlemen:

You are to be commended for the thoroughness of your efforts in formulating draft regulations for underground (UG) storage tank installation, monitoring, and control. This is a difficult problem, especially for existing installations where the integrity of the present tanks must be verified before a monitoring program can be implemented.

Mindful of these difficulties, we submit two points for your consideration.

POINT 1

In reviewing the draft regulations, frequent reference is made to situations where "groundwater level fluctuates above and below a point 5 feet below the tank invert."

In our opinion, underground tanks should not be allowed where groundwater is at such an elevation that tank leakage and the resulting groundwater or vadose zone contamination could occur quickly. There would be insufficient time between notice of a detected leak and effecting repairs before some contamination would occur. Because of like instances where the "safety margin" is very small, the board should have the authority to prohibit installation of underground tanks, and have existing tanks removed, in certain high-risk locations. In these locales, only above ground tanks would be allowed.

The board would determine what groundwater elevation provides an acceptable "safety margin" in such situations.

Received DTS

OCT 22 1984

POINT 2

Section 2647 - Assurance Groundwater Monitoring.

This is first a retrospective requirement, and secondly it foists upon industry an additional requirement which essentially provides for double protection. Groundwater monitoring should necessarily first be the responsibility of the water boards

Shipping Address: 12335 S. Van Ness Ave., Hawthorne, CA 90250-3378

Telephone: (213) 757-1801 — TWX: 910-321-4074

and utilities who have the expertise and organizational capability to implement a state or regional program of the required scope.

For existing tanks, primary containment and leak detection monitoring controls are required. Unless a facility is sufficiently large, or has existing leaking underground tanks, the additional requirement of groundwater assurance monitoring, cannot be justified as a general criterion for all underground tank installations. Furthermore, groundwater installations at discrete facilities could provide erroneously comforting information.

Groundwater monitoring at individual facilities would be of questionable worth in determining water quality of extensive aquifers at the point of delivery by the utility. The reporting and administrative burdens involved in assimilating groundwater data from individual plants would be very expensive, of questionable significance, limited benefit, and certainly wasteful of everyone's resources.

As an example, consider the following scenario, which would be required under the present rule. Many small to medium facilities, with several underground tanks each, and located in the same industrial neighborhood, would all be required to employ groundwater assurance monitoring.

Ground water quality does not vary substantially within a limited geographic area. Analytical methodology is such that any significantly hazardous groundwater contaminants can be identified, and that chemical so identified can be connected to the facility from whence it originated, since tank inventories and permits will provide this "fingerprint" information.

Several wells properly located and installed would provide the necessary water quality information for an entire regional area. Groundwater monitoring well installation and maintenance costs could be shared among all facilities in the particular region as an included part of the underground storage tank permit program.

The key to the installation of effective groundwater wells is their location relative to the underlying aquifers (or vadose zone) and the direction of flow. Proper location of monitoring wells at individual facilities may not be practical due to property boundaries. It follows that the installation of groundwater monitoring wells cannot be selectively required. This provides a strong argument for any groundwater monitoring program to be under the exclusive control of the water boards and utilities.

Several accurate data points are preferable to a morass of data collected from individual facilities. Installing groundwater wells at every facility using underground tanks is simply not necessary to assure groundwater quality.

SUMMATION OF DISCUSSION

1. Their are certain areas where hydrogeological conditions may preclude the use of underground container storage, in order to maintain an adequate "margin of safety" to prevent groundwater contamination. In these circumstances the board must have the authority to prohibit underground tank installation and to have existing underground installations removed. The SWRCB could define groundwater elevation variants in terms of a "margin of safety."

2. The State and Regional WQCB, together with the Army Corps of Engineers and the water utilities should have sole responsibility for supervising the installation of whatever groundwater monitoring wells may be needed.

The requirements of Section 2647 are at the outset, retrospective. Industrial plants, where tank leak detection devices are already operable and mandated under the rules, should provide the requisite protection.

Industrial plants should not have to prove the quality of groundwater underlying their facility, unless there is direct evidence to suggest that facility has contaminated the groundwater or is a sufficiently large risk so as to justify groundwater wells on-site.

A groundwater installation and monitoring program can be best organized and administered by the boards. A groundwater monitoring program needs to be set-up very carefully to provide representative water quality data. The board has the expertise and resources to do this properly. Industry generally does not and would rely on consultants, eager for business, whose installations would satisfy the letter of the law but not necessarily the intent of protecting groundwater.

Assurance of groundwater quality could be better provided by the installation of several properly located wells in a region under the supervision of the water boards and utilities.

We certainly appreciate the opportunity to comment on the draft underground tank regulations. For the reasons discussed we feel there are some serious problems still to be resolved, most especially those concerning groundwater assurance monitoring.

Thank you very much.

Sincerely,

Gregory P. Martin

Gregory P. Martin,
Environmental, Health &
Safety Coordinator

GPM:ss
cc: R. Poet
C.E. Sanford
Al Drew, SPI
Hank Martin, CMA

SILMAR
DIVISION OF SOHIO CHEMICAL CO.

HS

#64

Reliable Transportation, Inc.

Telephone (408) 244-2748

P. O. BOX 245 • SANTA CLARA, CALIFORNIA 95052

October 18, 1984

Mr. Harold Singer
Division of Technical Services
P.O. Box 100
Sacramento, Ca. 95801

Dear Mr. Singer:

I understand that there is a hearing scheduled for October 23, 1984 which will deal with regulations on owning or operating a storage tank used for storing fuel.

We operate a storage tank to service our diesel trucks which operate between San Francisco and Los Angeles.

I strongly urge you to recommend that the proposed regulations do not go beyond the jurisdiction granted to the Hazardous Substances Act. If the proposed regulations were implemented, they would financially bankrupt hundreds of small business. As proposed, they are discriminatory, unfair and confiscatory in nature.

Please consider our position and urge your constituents to consider the alternatives presented by CIOMA, WOGA and the California Manufactures Association.

Yours truly,
RELIABLE TRANSPORTATION, INC.

Arthur La Londe

Arthur F. La Londe

AL/b

Received DTS

OCT 22 1984

#65

J B DEWAR INCORPORATED
SINCE 1933
SERVICE IS OUR BEST PRODUCT

October 17, 1984

Harold Singer
Division of Technical Service
P.O. Box 100
Sacramento, California 95801

Gentlemen:

The recent passage of the Underground Storage of Hazardous Substance Act ("ACT") is of great concern both operational and financially as it effects me in owning and operating storage tanks used for the storing of fuel, solvent, and oil. Even more important are the proposed regulation (regs) prepared by the State Water Resources Control Board implementing this act. In my opinion and in the various association such as California Independent Oil Marketers Association (CIOMA) and Western Oil and Gas Association (WOGA) the proposed regs go far beyond the jurisdiction granted to the Board by the Act.

I will comment on some of the problems from my own individual business. I am responsible for some 72 tanks that we own and operate in our small Distriborship. These are Bulk Plants and Service Station tanks. The enormous expenditures threatens the servival of our company. What follows are but a very few of our concerns and most importantly what you can do to help combat the potentially immense cost that will incur.

To begin with, compliance must be accomplished by July 1, 1985, yet the fiscal impact study prepared by the State allows for a five-year implementation. The six-month time frame for compliance is unrealistic and does not allow for alternatives to be considered, let alone implemented.

One section of the proposed regs states that one of the objectives of the monitoring program is " to determine if unauthorized releases have occurred in the past". In another section, the proposed regs state, the soil-testing requirement is expressly designed "to determine if prior usage of the underground storage tank has resulted in an unauthorized release." In contrast, the main section in the Act relied upon by the Board as an authority in the proposed regs, speaks only of " a monitoring system capable of detecting unauthorized releases" of hazardous substances. Nothing is stated in the Act regarding past or historical unauthorized releases. The cost to clean up historical releases can easily run into the tens of thousands of dollars.

Received DTS
OCT 22 1984

DISTRIBUTOR OF PETROLEUM PRODUCTS
2947 SOUTH HIGUERA STREET • SAN LUIS OBISPO, CALIFORNIA 93401 • TELEPHONE (805) 543-0180

Continued:

The Act statute regarding monitoring of tanks installed prior to January 1, 1984 allows for "Alternative methods of monitoring the tank on a monthly or more frequent basis that may be required by the local agency." *However*, the proposed regs list a number of monitoring methods, all of which are required for existing tanks... again very expensive and clearly not what was intended by the statute. Examples such as these are throughout the proposed regs.

While none of us want to contaminate the underground water supply, the proposed regs go far beyond the jurisdiction granted to the Board by the Act. These regs impose unnecessary costs taht can threaten *the financial* survival of my business.

Thank you.

Yours very truly,

Jack Dewar

Jack Dewar
President

JD:jr

66

HS

Chevron

Poma Distributing Co., Inc.
Jobber, Chevron U.S.A. Inc. Products
571 West Slover Avenue, Bloomington, CA 92316 • Phone (714) 877-2441
Mail Address: P.O. Box 5728, San Bernardino, CA 92412

October 18, 1984

Mr. Harold Singer
State Water Resourses Control Board
PO Box 100
Sacramento, Ca 95801

Dear Mr. Singer,

This correspondence is in reference to the proposed regulations governing underground storage of hazardous substances, as outlined in Subchapter 16 of Chapter 3, Title 23, California Administrative Code.

I have no objection to the requirement that any person who owns an underground storage tank be required to have a permit to operate such a tank. Also, that each individual firm be responsible for the monitoring of their inventory and that an annual tank test be made to verify the condition of the tank.

In reviewing the "Draft" of this regulation, I could not believe that any agency would promulgate a regulation that would create a burden on the small business firms and taxpayers within the state of California of $500,000,000.00 to $1,000,000,000.00 per year. In my opinion, we might better spend these monies to find a cure for cancer and heart disease.

As a distributor of petroleum products in Southern California, I can tell you that this proposed legislation will put us out of business over the next five (5) years. There is no possible way a small business could conform to your guidelines and maintain a bulk underground storage tank for his business. Our customers, approx. 1400, would be forced to remove their facilities and purchase their products at the retail service station level. The retail service stations would be owned and operated by major oil companies, as they are, in my opinion, the only ones that could afford to meet your proposed regulations.

I urge that this regulation not be approved as written and that it go back to committee for further study.

Very truly yours,

G. S. Poma

Received DTS

OCT 22 1984

cc: Mr. William Leonard
Mr. C. M. Riley

#67 HS

PENCE PETROLEUM CO.

920 EAST TRUXTUN AVENUE (805) 327-4373
BAKERSFIELD, CALIFORNIA 93305

October 19, 1984

Mr. Harold Singer
Division of Technical Services
PO Box 100
Sacramento, CA 95801

RE: Adoption of Proposed Regulations Governing Underground Storage of Hazardous Substances

Dear Mr. Singer,

I would like to offer the following comments for consideration on my concern of the proposed regulations prepared by the State Water Resources Control Board.

While none of us want to contaminate the underground water supply, the proposed regulations are not simple and appear to go far beyond the jurisdiction granted to the Board by the Underground Storage of Hazardous Substances Act.

Nothing is stated in the Act regarding past or historical unauthorized releases, while in contrast one section of the regulations states that one of the objectives of the monitoring program is "to determine if unauthorized releases have occured in the past." the cost to clean up historical releases could easily run into the hundreds of thousands of dollars. this cost would be very devastating, not only to my business, but to the vast majority of the businesses owning and operating tanks in this state.

The compliance date must be accomplished by July 1, 1985, yet the fiscal impact study prepared by the State allows for a five year implementation. The six-month time frame for compliance is unrealistic and does not allow for alternatives to be considered.

In closing, I can only emphasize the importance of the Board's consideration of the analysis and alternatives presented by others. We must work together in implementation of this Act in order to control the potentially immense costs that will incur.

Sincerely,

PENCE PETROLEUM CO.

Charles Pence

Charles Pence
President

Received DTS
OCT 22 1984

HS

#68

ENGINE RESEARCH CO.

Dynamometer Development
Air Flow Testing
Racing Gasolines - Gasohol
Methanol - Performance Additives
Engines - Components

Water Resources Control Board
PO Box 100
Sacramento, Calif. 95801
ATTN: Harold Singer

October 12,1984
page 1

Ladies and Gentlemen of the Board,

I am submitting this letter as pertinent comment and information related to the pending review of hazardous materials stprage regulations which have been proposed as a function of the Sher Act.

I am the owner of a small powerplant development and specialty motor fuels firm in San Lorenzo, Calif. I have had over 20 years experience with a variety of automotive development projects ranging from high-tech hard parts development to alternative fuels research. I believe that my technical background and my exposure to empirical scenarios qualifies my comments.

I should also mention that I have long been concerned with air and water quality and the potential environmental dangers resulting from improper storage, dispensing and use of hazardous materials.

I am specifically concerned that well-intentioned individual elements of upcoming Sher Act regulations will pose extreme hardship and will achieve little net public good. The elements provoking my concern are those related to underground tank storage of motor fuels. I am fearful that underground tank storage regulations will be imposed state-wide which are similar to those recently enacted in many municipalities. These municipal and local regulations, which I believe to be not in the true public interest, have required double-wall underground tank construction and, in some cases, supplemental elaborate monitoring well installations. I believe that, at this point in time, a careful rethink of regulations such as these is in order.

I would suggest to the board that other, effective measures could be implemented which would equally protect the environment and serve the public good. Steel, single wall tankage, epoxy sealed with cathodic protection has already proven effective and is purchasable for approximately 1/2 the cost of double wall tanks. But most importantly, this type of construction effectively shields the tank structure and contents from ground moisture, soil chemicals and electrolytic erosion.

The financial impact of a severe, new regulation mandating double wall tankage would be enormous and would impact most negatively on the typically under capitalized small businessman. For illustration, please consider that a 12,000 gallon, single wall, epoxy coated, cathode protected tank sells for approximately $5950.00. A double wall steel tank, with the same specifications, sells for over $13,000.00. More than double !

OCT 22 1984

It doesn't seem speculative to say that initially increased cash outlays on this order would effectively discourage, if not totally stifle, small entrepeneurs.

Additionally, the monitoring and soil sampling requirements as written into the proposed regulations would place an intolerable financial burden on the businesses and individuals who have storage with small throughputs on the order of 5000 gallons per month.

In closing, let me ask you to carefully consider the full financial impact of new regulations on those who would have to struggle the hardest to comply. I would suggest that you carefully examine the effectiveness/cost ratio of new tankage systems with an eye to maintaining the viability of the small motor fuels entrepeneur. Lastly, I would ask you to be wary of developing expensive, overkill remedies when air and water quality can be well protected with more affordable solutions.

Thank you very much for allowing me to submit this information. Additionally, if I can be of any assistance to the Board on this matter, please don't hesitate to request it. I would be happy to help.

Sincerely,

Richard F. Gold

Richard F. Gold
Engine Research Co.

cc: file

RECEIVED
JAN 10 1985
DIVISION OF WATER QUALITY

68-B HS

ERC
ENGINE RESEARCH CO.

Dynamometer Development
Air Flow Testing
Racing Gasolines - Gasohol
Methanol - Performance Additives
Engines - Components

State Water Resources Control Board
Paul R. Bonderson Bldg.
Division of Water Quality
P.O. Box 100
Sacramento, Calif. 95801-0100

1/4/85
(page 1)

Members of the Board,

This letter is intended as pertinent comment related to the adoption of regulations governing underground storage of hazardous substances to be codified in Subchapter 16 of Chapter 3 of Title 23 of the California Administrative Code. This letter was composed and dispatched pursuant to your notice soliciting comment on these matters which was received in early January.

At present I would like to offer the suggestion to the Board that double containment storage tanks and/or membrane liners not be required in situations where only motor vehicle fuels are stored. It seems patently unneccessary and excessively costly to require these expensive tanks and/or liners when single wall steel, cathodically protected and electrically isolated (epoxy clad or fiberglass clad) storage tanks are available. Steel single wall, cathodically protected and electrically isolated storage tanks are available with 30 year guarantees at a cost equal to 1/3 to 1/2 the cost of couble wall containers. Obviously this cost reduction, while still providing secure, corrosion resistant containment, greatly reduces the financial burden on the small businesses least able to afford ultra-expensive double wall tankage.

Additionally, I would suggest that secondary containment membranes not be required in cases of motor fuel storage; and that, instead, rigorous,conventional inventory control procedures (i.e. tank"sticking", dispensing meter reconciliation and delivery tanker compartment volume notation) be used to detect losses of product from storage tanks. My 20 plus years of experience with these procedures and questions shows me that these above mentioned measures and systems, consistently applied and consistently performed, will detect even minute product losses. As well as accurately detecting potential product losses, systems such as these will save small businesses millions of dollars over time.

Also, it would seem that the application of rigorous, accurate inventory control procedures and the installation of simple, conventional monitoring well systems, as opposed to elaborate, electronic monitoring well hardware, will guarantee product loss recognition and again reduce small business burden immensely.

Essentially, I am pleading with the Board to adopt simple, cost-effective regulations which facilitate enforcement and recognize the

Received DTS
JAN 11 1985

68-B

ENGINE RESEARCH CO.

Dynamometer Development
Air Flow Testing
Racing Gasolines - Gasohol
Methanol - Performance Additives
Engines - Components

effective technology which presently exists. I urge you to please be aware of the immense financial impact of stringent, costly regulations on small businesses.

Thank you for your time and attention to this letter. I sincerely appreciate being given this opportunity to submit this comment.

Sincerely,

Richard F. Gold
Engine Research Co.

584 East Lewelling Boulevard · San Lorenzo, California 94580 · (415) 278-3571

#69 HS

TAXICAB PARATRANSIT
TPAC
ASSOCIATION of CALIFORNIA

1005 EIGHTH STREET, SUITE 205
SACRAMENTO, CALIFORNIA 95814
(916) 441-0393

October 22, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
901 P Street
Sacramento, CA 95801

Re: Proposed Regulations Governing Underground Storage of Hazardous Substances

Dear Mr. Singer,

This letter is to inform you that the Taxicab Paratransit Association of California is concerned with the magnitude of the proposed regulations governing underground storage of hazardous substances, to be codified in Subchapter 16 of Chapter 3, Title 23, California Administrative Code.

Our members are, generally speaking, very active in transportation - but they are small businesses. The proposed regulations appear to be too onerous to the small business entity by requiring a very high capital investment.

We ask that, in reviewing these proposed regulations, the board keep in mind the small businesses that will be affected and the substantial cost of complying with the regulations.

If you have any questions about the concerns of the Taxicab Paratransit Association of California with the proposed regulations, please call our legislative advocate in Sacramento, Gerald J. Desmond, Sr., at (916) 441-4166.

Sincerely,

Jim Steele

Jim Steele
President

JS:sm

#70 HS

Kenneth R. Henneman, Consulting Engineer
3142 Montpelier Court
Pleasanton, CA 94566
(415) 846-4450

October 17, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Re: Proposed Underground Tanks Regulations

Dear Mr. Singer:

At the ASCE symposium last week you indicated I should write down primary concerns with the proposed regulations relating to drilling monitoring wells. The SWRCB staff geologist said the same thing when I talked briefly with him.

As I understand regulation sections 4.16 to 4.30, you will require exploratory borings, vadose zone monitoring wells, groundwater leak detection wells, and assurance monitoring wells. Some of these can be the same hole. On pages 11 through 19 (article 4) of the Fiscal Impact Statement, you propose three deep wells dug into the aquifer for alternatives 1, 2, 3, and 4, and four shallow wells (to tank fill bottom) for alternatives 2, 3, 4, and 5. The cost is $2 billion for the 200,000 tanks, or $10,000 per tank. The result of this expenditure is 600,000 wells directly connecting hazardous waste tanks with the groundwater! I have a problem with this. I am concerned.

In the past, we tried to prevent connecting pollution sources with the groundwater. In the 1950s and 1960s the state water agencies were very concerned about sea water intrusion and shallow pollution from septic tanks, and from the ground surface. State well standards were developed and, sometimes, county standards were written. Key problems these standards deal with are wells located too close to pollution sources and wells allowing polluted (or contaminated) water to flow down the well (page 4 of Bulletin 74-81, State Well Standards). Solvents move through most soils; they could move faster along a well casing or well seal, and they would certainly move faster down a well. Detecting a 0.05 gallon per hour (200 gallons in six months) gas leak would be easier with a well, since the gas would probably get to the water faster. You accomplish detecting the leak, but it might be a better water pollution prevention strategy to risk not finding small leaks right away, than to risk polluting the groundwater. Without the well, the natural soil could retard or prevent downward movement of the material and prevent pollution of main groundwater zones.

The tradeoffs should be considered. Some monitoring guidelines recognize the problem. Los Angeles County guidelines do not normally require drilling over 40 feet down, or through a clay lense over 5 feet thick. Likewise, Alameda County Water District guidelines recommend stopping at a competent aquitard, or 45 feet, but require that professional judgment be used. The number of wells required in the different guidelines

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OCT 22 1984

vary, as does the number of vadose wells relative to the number of groundwater wells. The more wells, the greater the potential for a problem. The number of wells required in the different guidelines vary, as does the number of vadose wells relative to the number of groundwater wells. I know you and other SWRCB staff are concerned about detecting leaks. Daily product monitoring and tank integrity tests are not completely dependable. But perhaps, by considering tank types, age, and use; groundwater location, use and depth, and vadose zone characteristics; and with careful inspection and more frequent integrity testing, etc.; the number of wells could be reduced significantly, and even eliminated in many cases.

I have talked with several groundwater experts who have not reviewed your guidelines. Perhaps a review panel would help attract their attention to the problem. Consideration should be given to evaluating the risk created by drilling with the risk of failure of other types of monitoring; and to the resulting problem and its effect on groundwater degradation, groundwater supply, and public health. Risks, costs, methods, and the value of expensive wells and monitoring equipment could be examined. A committee composed of state experts in groundwater resource pollution problems, groundwater management, well construction, underground tanks, and in monitoring devices perhaps could address the problem before a $2 billion program was initiated. With so many groundwater problems in the state, care should be taken before embarking on such a large expenditure without considerable discussion among the public and the water interest to make sure it is the most productive way to protect the public from water polluted by leaking tanks.

I appreciate the opportunity to be able to comment on the proposed guidelines. Please call if I can be of help in any way.

Sincerely yours,

Ken Henneman

Kenneth R. Henneman

kk

#70 B

Kenneth R. Henneman
Consulting Engineer
3142 Montpelier Court
Pleasanton, California 94566
(415) 846-4450

Received DTS
NOV 21 1984

November 19, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

RE: Proposed Underground Tank Regulations

Dear Mr. Singer:

Since I complained about the original draft regulations, it is only fair to tell you the revised ones are much better. Thanks for changing them. I know how much effort it is to write new regulations, and appreciate your work.

Sincerely,

Ken Henneman
Kenneth R. Henneman

cho

cc: Mr. Robert Ford

Original Comments 71-80

Index to Rulemaking File Underground Storage Tank Regulations Title 23, Waters Division 3, Water Resources Control Board Chapter 16, Underground Storage Tank Regulations **1985**

#71 ~~HS~~

california fuels

October 17, 1984

Harold Singer
Division of Technical Services
P O Box 100
Sacramento, CA 95801

Dear Sir:

I wish to comment on the proposed Underground Storage of Hazardous Substances Act implementation regulations.

The intent of the legislation is beneficial and is surely worth while.

With any program that is new, far reaching, and direction changing, the start is the key to its downstream success.

San Diego County along with the Air Resources Board discovered that by banning emissions from fueling at the 100% level, the county never did get their air quality program off of the ground. Delay followed delay; litigation compounded with administrative stalling crippled what was a well intentioned objective.

It appears that the tank leak rules are being directed to monitor the ecosystem not the tank. The "historical" aspects of the site were not part of the original legislation. Holes will be punched into the earth with abandon. Money costs and the impact on business is verbally recognized but not really understood. The whole program seems to be taking on a life of its own.

Specifically, we "operate" 20 tanks. Cost estimates published in the proposals were $20,000 over the first five years for each tank yet the same proposals mandate compliance by July 1985 compressing the costs into a six month span not five years.

Using State figures, the costs for compliance on my 20 tanks will be $400,000, a number that is nearly double the net worth of my company. If I were able to borrow this sum, the payback at current bank rates and times (15.75%-60 months) would be $9,672 per month or $116,074 a year. Our firm has never earned an operating income nearly that large. A great inhibiting cloud has been thrown over an industry that is generally innocent of pollution.

Received DTS
OCT 22 1984

3005 Navy Drive • P.O. Box 1207
Stockton, California 95201
(209) 466-5921

P.O. Box M
Woodbridge, California 95258
(209) 333-1011

In adopting legislation we ask that they be imposed on a phase-in that recognizes the financial impact on small business. Don't put too much store in Small Business Administration loans as they are not geared or priced for this type of a nonproductive expenditure. Don't assume that scientific staff is dealing from a full deck when facing real problems and costly solutions. Don't assume that resources such as geologists, hydrologists, drillers, soil chemists, program administrators, and other support people are in infinite supply and can be mustered in reasonable fashion to provide an efficient compliance to an arbitrary solution-of-problem date.

You are asking me to mortgage my life's work on the basis of serious problems at one end and at the other a third assistant administrator who can interpret the "rules" without regard of the difficulty of compliance, the degree of compliance or degree of the local problem.

I ask that you don't put the small gasoline and diesel marketer on an impossible fast track, that the rules be reasonable considering the full chain of distribution and documentation and that you do not set goals that are soluable only by big government and big business.

We want clean pure water too, so let us be a healthy part of the solution.

Very truly yours,

L. J. Atwater
President California Fuels
Past-President California Independent Oil Marketers
Past-General Chairman of the Pacific Oil Conference

#71-b

california fuels

Water Resource Board
Paul R. Bonderson Building
901 P. St. P.O. BOX 100
Sacramento, CA 95801

Date: January 15, 1985

Re: Underground tank regulations

Dear Gentlemen and Ladies:

Thank you for your numerous hearings on this important subject. I am writing to you because of the tremendous impact these proposed rules will have on my small company and on my customers. Many of these customers will simply go out of the gasoline business because of the prohibitive costs involved in complying with these rules. I would like to point out several areas I feel need re-working and/or elimination.

1) 2640 (b) States that unauthorized releases are to be detected before ground water is affected. The next sentence contradicts the previous statement, and says that "ground water monitoring may be utilized as a primary means of monitoring...". By the time a leak can be detected the ground water is already contaminated. The last part of the sentence is even more rediculous "...when the ground water does not have actual or potential beneficial uses." In a state that is digging trenches, canals, wells and building dams like mad and according to literature publised by your own department most of the underground tanks in California are located in area where there is potential or beneficial use for the water around or under those tanks.

Statement: This rules out most ground water monitoring as a monitoring alternative.

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JAN 17 1985

3005 Navy Drive • P.O. Box 1207
Stockton, California 95201
(209) 466-5921

P.O. Box M
Woodbridge, California 95258
(209) 333-1011

2) 2641 (c) (1) Using currently apporved and available technology, tank testing will cost $300.00 to $400.00 per tank per month, which means $10,000.00 to $14,500.00 per year for a typical 3 tank station. This will drive most independent or small mom and pop dealers out of business.

Statement: Can you call loss of ones job an alternative?

3) 2641 (c) (6) This "monitoring alternative" is supposed to be for motor vehicle fuel storage tanks. The reasons for all the superfluous overlap of monitoring devices is unknown. Why should someone use this alternative when alternatives 2, 3, or 4 meet the requirements without being overly duplicative. This obviously is a false bone that has been thrown out in the hopes of shutting up the opposition to these rules in general.

Statement: This is basically option 2641 (c) (5) with minimum 2 more back ups to further inflate the cost of stopping leaks.

4) 2641 (c) (3 and 4) These "options" are in direct contradiction to their own requirements. Both alternatives say that ground water under tanks must not have any actual or potential beneficial uses (municipal, domestic, industrial, or agricultural supply) and not hydraulically connected to other useful water. As stated earlier in this letter according to D.W.R. (Department of Water Resources) literature and looking at the locations of most tanks ground water in the areas would disqualify both of these alternatives in all but a few locations in the STATE!

Statement: Two more non-alternatives offered by the state to business which supports this state.

5) 2641 (c) (5) This might be a workable alternative except for the fact that the daily tank stick triggers are totally unnecessary. Businesspersons cannot afford to lose gallons into the ground and most do reconcilliations now; plus

5) Cont'd 2461 (c) (5) the annual tank test works as a backup. If a station owner or operator overlooks a leak it just means clean up will be harder and more expensive later, and not in their best interest.

Statement: This law should be in the best interest of everyone. People and environment first, business second, bureaucrats last. As the alternative exists now all it will create are a bunch of cheaters.

6) 2635 (b) (4) Why must an F.R.P. coated tank also have cathodic protection? Maybe with all their resources the staff neglected to consult a qualified corrosion engineer.

Statement: When in doubt be superfluous it does not cost the state any money.

7) I would like to make a proposal offered as alternative 8. This includes pipeline leak detectors, inventory reconcilliation with no gallonage triggers, annual tank tightness tests and a seven year phase in of dual containment which is obviously the ultimate goal of not only the station owner/operator but of the D.W.R. as well. This would accomodate small business and large to commit to dual containment one seventh of their tanks each year until dual containment is complete.

In conclusion, any alternative or "great answer" which punches holes in the ground creating a possible ground water disaster situation lacks foresight, which is the key to answering any large problem. The next key is working with the business community that keeps the tax dollars rolling in and the public employed. Thanking you in advance for your consideration.

Respectfully submitted,

David B. Atwater

David B. Atwater
Vice-President Marketing

DBA/cmw

SERVE YOURSELF & MULTIPLE PUMP ASSOCIATION, INC.
3960 WILSHIRE BOULEVARD SUITE 401A
LOS ANGELES, CALIFORNIA 90010

LOS ANGELES, CA
PM
19 OCT
1984

State Water Resources Control Board
P.O.Box 100
Sacramento, CA 95801

ATTN: Carole A. Onorato

#72 HS

EXXON

REDDING OIL COMPANY

PHONE 916—243-1217 P. O. BOX 280
REDDING, CALIFORNIA 96099

October 17, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Dear Mr. Singer:

I have reviewed your draft regulations to establish standards and procedures for permit programs for underground storage of hazardous substances, including gasoline, diesel, and drain oil. I am most concerned about the possible economic impact the proposed regulations could have not only on our business, but on the businesses of our seventy-six customers with underground petroleum storage tanks.

We always have counselled our customers to maintain strict control over their underground tank inventories, since no one wants to contaminate underground water supplies. However, the economic return we and our customers are earning from these 135 tanks would in no way justify complicated and expensive monitoring and tank testing costs, let alone within such a short time frame as July 1, 1985.

We also are concerned that we may be liable for catastrophic expenses to mitigate leaks which might have occurred before we even owned the land or tanks involved.

We thus ask that you simplify and delay compliance requirements until monitoring and testing technology is available at a more reasonable economic cost. We also ask that your regulations include provisions for minor historical releases which may be detected but which pose no danger to groundwater.

Regards,

Jack Reiser

Jack Reiser

Received DTS

OCT 22 1984

H5

#73

cressey
beverage distributing

Oct. 16, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
P.O. Box 100
Sacramento, Calif. 95801

Dear Mr. Singer,

The purpose of this letter is to express my concearn, as a small Business owner, as to the financial ramifications of the purposed regulations that may be eztablished for underground storage of hazardous substances.

We feel that the present method of controling the inventories by a physical count is more than adequate to detect any leaks that might develop in our tanks. The added costs of monitoring devices and the upkeep of this equipment would offset the small savings in fuel costs that we have realized with the installation of our tanks. As I am sure you are aware, it is difficult enough for a small business to keep the "bottom line" out of the "Red" and we feel that such proposals would only add to all of our costs with little benefit to anyone except the people that produce the monitoring devices.

Please consider the small business man when these important regulations are brought up in the near future.

Sincerely,

Gary R. Cressey

Gary R. Cressey
Owner
Cressey Beverage Distributing

Received DTS
OCT 22 1984

GRC/jrw

4948 caterpillar road • p.o. box 524 • redding, california 96099 • (916) 241-4932

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Cc - Bd
Auton
Delay

SERVE YOURSELF & MULTIPLE PUMP ASSOCIATION, INC.

3960 WILSHIRE BOULEVARD
SUITE 401A
LOS ANGELES, CALIFORNIA 90010
(213) 387-3114

SERVE YOURSELF & MULTIPLE PUMP ASSOCIATION INC. CERTIFIED SAVE MEMBER

October 17, 1984

State Water Resources Control Board
P.O.Box 100
Sacramento, CA 95801
ATTN: Carole A. Onorato

Dear Ms. Onorato:

The Proposed regulations for underground storage of hazardous material by the State Water Resources Board is, as proposed, devastating to the small (and large as well) independent service station operators.

To enumerate our concern one by one: the limited time it allows us to evaluate and plan our action, perhaps even to find a better and less expensive way to comply with the necessary end result. Time limits our ability to explore alternative methods.

Next our objection to explore so-called Historical Contaminations (if any): since any service station older than a very few years must have been exposed to spills of gasoline that may have permeated the concrete and contaminated the ground several inches below the surface and perhaps hundreds of feet above the water table and perhaps as much as 500 feet above the equifer. Any expert can swear to this.

Even though we expect the regulations to be observed by everyone, for the small independent it will mean bankruptcy. The majors easily recover the cost, whatever it may be, by adding the cost to the dealer's price or raise the rent. The dealer can increase his retail price and the people of California eventually will be paying for the entire project. Not so with the small dealers, who own their stations and who will not be able to recover the cost, who can't even stay in business with the estimated costs of up to $25,000 or more in some instances.

We want clean water and are willing to work for it, but putting us out of business will not help.

We urge the Control Board to revise all submitted objections and adjust the regulations to a sane and attainable level, that all concerned can wholeheartedly support.

We aim to work with you to achieve a reasonable goal-but remember, you will not succeed by putting us out of business and have the people of California pay for unnecessary expense by knocking out the only competitive force in the market place, namely the independent operators.

Ms. Onorato, I trust you will see that logic and common sense will prevail and will do what's needed to eliminate the unnecessary difficulties for everyone concerned.

Yours truly,

Paul T. Erdos

Paul T. Erdos
Executive Director

cc: Harold Singer
PTE:ee

#15 HS

ARMOUR OIL COMPANY

October 17, 1984

State Water Resources Control Board
Division of Technical Services
P.O. Box 100
Sacramento CA 95801-0100

Dear SWRCB:

Unless we get some more specific and definitive guidelines for underground storage of hazardous material soon, we will be unable to comply by the January 1st deadline. It's not that we don't want to or are in any way being uncooperative, it is merely the logistics involved.

Is there now or will there soon be available a guide specifically for the petroleum retailer? That would help insure that all are appraised of their responsibilities and eliminate having to interpret so many legal and engineering terms. Yes, we have read and reread all of the various drafts and find they pose more questions (for us) than they answer. Even our consultants, who presumably employ trained engineers, are having trouble with the proposed regulations. We know your task is not an easy one, with literally hundreds of details to be attended to. We can be patient with the process, if we know you will be patient with us if compliance does not occur overnight!

Sincerely yours,

R E Andrews

R. E. Andrews

REA/ls

Rec'd

OCT 2

POST OFFICE BOX 85302 • SAN DIEGO, CA 92138-5302 • TELEPHONE (619) 291-1000

#16 10/22 - org Austin
cc - BA
WGP
Richards

Regional Council of Rural Counties

1121 "L" Street
Suite 508-A
Sacramento, California
95814
(916) 447-4806

October Twenty-Second
Nineteen Eighty-Four

Ms. Carole A. Onorato, Chairwoman
and Members, Water Resources
Control Board
901 P Street
Sacramento, California 95814

Attention Harold Singer
Division of Technical Services

Dear Madam Chair and Members:

At a recent meeting of the Board of Directors of the Regional Council of Rural Counties (RCRC), the Supervisors considered the impact of Chapter 1046, Statutes of 1983 (AB 1362 Sher) and the proposed Subchapter 16 regulations dealing with underground tanks and concurred with the Modoc Board of Supervisors' contention that the compliance with such laws would be prohibitively expensive to the tank owners and not cost-effective as to enforcement by the rural counties (letter - Modoc County attached).

As you know, rural interests are difficult to represent, not only because of their remoteness, but also because of their complex diversity. In the past the rural counties have often felt both politically and geographically isolated. In many instances, such as AB 1362, legislative solutions designed to solve problems confronting county government address themselves primarily to urban and metropolitan areas. Conceivably, such actions might prove to be unrealistic, inconsistent, and inappropriate for the health, safety, environmental and economic welfare of the rural areas.

What we are asking is that the Water Resources Control Board recognize and support efforts planned by RCRC to secure the required approval by the Legislature and the Governor to allow the rural counties flexibility and selected local options whenever feasible and consistent with the overall public policies embodied in the enabling legislation. We intend to seek financial assistance/incentives to address the dire economic implications imposed by the present regulatory and statutory requirements.

Madam Chair and Members, the tank owners, county officials and the residents of the rural areas are concerned and most anxious that you and your colleagues, as well as the involved legislators, be absolutely certain that the new law and regulations do not impose unfair and unnecessary burdens on individuals or the rural economy as a whole. RCRC believes that the proposed program will have a very negative economic and social impact with a disproportionate private and public cost demand and other severe technical difficulties due to lack of financial and human resources needed for compliance.

There is more that unites rural areas than divides us.. In the spirit of fostering continued progress and reasonable standards, a workable implementation process and methods to allow industry or rural local government to vary from strict interpretation of the new law, we call upon all state decision-makers to support efforts by RCRC to inspire the Legislature to instill fairness and equity as overriding considerations in the rural areas. We believe further that everyone should pay his fair share of the burden, and, hopefully, modifications to the new law will also guarantee equality of sacrifice.

RCRC pledges its very best efforts in working with you toward the stated goal to protect human health and the environment as this is our best hope to influence the future destinies of rural California.

Thank you for allowing RCRC the opportunity to submit these brief views and for your consideration of our concerns that the economic well-being of the rural areas and the State's environmental health benefit from a recognition that these interests are shared, not disputed.

Warm personal regards,

LES H. COHEN

LHC:lam

Enclosure: Letter from Modoc County, 5/18/84

cc: The Honorable Suzanne Kuehl, President, RCRC
The Honorable Lesley J. Chace, Supervisor, County of Modoc
The Honorable Byron Sher, Member of the State Assembly

JOHN B. LAXAGUE
Cedarville
MELVIN "Andy" ANDERSON
Alturas
LESLEY CHACE
Alturas
M W "Mickey" JONES
Alturas
JOHN L. COULSON
Tulelake

MODOC COUNTY

Board of Supervisors

MAXINE MADISON
County Clerk
and
Clerk of the
BOARD OF SUPERVISORS
Box 131
ALTURAS, CALIFORNIA 96101
(916) 233-2215

May 18, 1984

Member Counties
Northern California Supervisors Ass'n.
P.O. Box 463
Redding, CA 96099

Dear Supervisors;

AB 1362 (Underground Storage of Hazardous Substances) has caused much discussion in the rural counties in the past few weeks. There is some confusion and uncertainty, and inconsistency in who should be appointed as the designated agency and how to implement this legislation.

I am very concerned about this State mandated local program and the ability for our county to cover all program costs with the permit fee. Initial evaluation shows that with our very limited number of underground storage tanks and the unreasonable amount of money we would need to charge it would still be impossible for us to recover all program costs.

Modoc County Board of Supervisors have not taken any action yet regarding this, however this is an agenda item for our May 21st Board meeting to request some assistance from our legislators.

I have already discussed AB 1362 and the several other Assembly-Senate bills with Assemblyman Stan Statham and Senator Ray Johnson and expressed my concerns.

I will propose to the Modoc County Board of Supervisors that we request the legislature to consider an exemption from implementation of this program in the rural counties until the guidelines have been clearly outlined and programs are well established in the larger counties where significant problems occur with the storage of hazardous substances.

Secondly, I feel that there is a need for some subvention funding (in a similar way to the Air Pollution subvention funding) to help the rural counties implement their programs. To substantiate this request, we will send a cost analysis for our program to our legislators.

Enclosed is a staff analysis of these bills, supplied to me by Senator Ray Johnson's office.

I am asking that your Board of Supervisors support our request for any assistance that you feel necessary in implementation of this program.

Assemblyman Statham indicated his willingness in co-operating with rural counties on this issue and needs information regarding your counties costs as soon as possible.

Sincerely,

Lesley J Chace

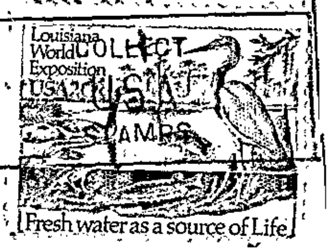
Lesley J. Chace, Supervisor
Modoc County Board of Supervisors

Enc.

cc: Nor Cal Supervisors Association
Butte County Board of Supervisors
Glenn County Board of Supervisors
Lassen County Board of Supervisors
Plumas County Board of Supervisors
Shasta County Board of Supervisors
Siskiyou County Board of Supervisors
Tehama County Board of Supervisors
Trinity County Board of Supervisors
Assemblyman Stan Statham
Senator Ray Johnson
Senator Jim Nielson
CSAC
RCRC

TOM HAMILTON, CHAIRMAN
BOARD OF SUPERVISORS
COUNTY OF SAN DIEGO
1600 PACIFIC HIGHWAY, ROOM 335
SAN DIEGO, CALIFORNIA 92101-2470

SAN DIEGO, CA 921
PM
19 OCT
1984



Ms. Carol Onorato, Chairwoman
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

#77 10/22 - Org WGP
cc - Bd

COUNTY OF SAN DIEGO

BOARD OF SUPERVISORS

1600 PACIFIC HIGHWAY, ROOM 335 • SAN DIEGO, CALIFORNIA 92101-2470

(619) 236-2249

TOM HAMILTON
CHAIRMAN
BOARD OF SUPERVISORS

October 19, 1984

Ms. Carol Onorato, Chairwoman
State Water Resources Control Board
901 "P" Street
P.O. Box 100
Sacramento, CA 95801

Dear Chairwoman Onorato:

On behalf of the Board of Supervisors of the County of San Diego, I request that you take the attached staff report and recommendations under advisement in adopting the regulations governing underground storage of hazardous substances.

If you have questions, or would like further clarification on this matter, please feel free to contact Donald G. Ramras, M.D., Health Officer, at (619) 236-2237.

Sincerely yours,

Tom Hamilton

TOM HAMILTON, Chairman
Board of Supervisors

Attachment

cc: *Gordon Duffy*, Secretary of
Environmental Affairs
Donald G. Ramras, M.D.,
Health Officer

COUNTY OF SAN DIEGO
DEPARTMENT OF HEALTH SERVICES
DIVISION OF ENVIRONMENTAL HEALTH PROTECTION
HAZARDOUS MATERIALS MANAGEMENT UNIT

STAFF REPORT: Proposed State Regulations Governing Underground Storage of Hazardous Substances.

BACKGROUND

AB 1362 (Sher), Underground Storage of Hazardous Substances, added provisions to the California Health and Safety Code which require local jurisdictions to regulate underground tanks by establishing permit and inspection programs. The need for the law became apparent when it was discovered that hazardous substances from leaky underground storage tanks had contaminated groundwater supplies in several California locations. To accomplish the goal of protecting groundwater resources, the new law establishes design, construction, and monitoring standards for all new underground storage tanks, and establishes monitoring systems requirements for all existing tanks. A significant requirement of the law is that all new tank systems must have secondary containment. The law, passed in September 1983, requires that the State Water Resources Control Board (SWRCB) promulgate regulations to implement the law and that law and the regulations be administered and enforced by a designated local agency.

On January 3, 1984, the San Diego County Board of Supervisors designated the Department of Health Services as the local agency responsible for implementing the provisions of AB 1362 in San Diego County. Ordinance #6753 was adopted by the Board of Supervisors on April 3, 1984 formally establishing the underground tank program and a fee structure for required permits.

The State Water Resources Control Board has developed the proposed regulations governing underground storage, pursuant to Section 25288.2(a) of the law, (Attachment C). The proposed regulations outline the standards for the design, construction and monitoring of new tanks; detail the monitoring requirements and methods for all existing tanks; specify recording and reporting requirements for unauthorized releases from tanks; outline procedures for repair of tanks; establish procedures for issuing categorical and site specific variances from the standards established for both new and old tanks; and set procedures for State Board approval of local design and construction standards more stringent than those set forth in the Health and Safety Code. The public comment period for the draft regulations extends to October 23, 1984. By law, the regulations must be adopted by January 1, 1985. As the designated local agency, the Department of Health Services will enforce the regulations as they are eventually adopted.

AB 3781 (Sher and Cortese, Chapter 1584, Stats 1984), was adopted September 29, 1984. This bill amended the provision of the law regarding the regulations that the State Water Resources Control Board must develop regarding monitoring existing underground tanks. AB 3781 provides that the State Water Resources Control Board must develop regulations specifying monitoring alternatives. It also gives the local agency certain flexibility in approving monitoring systems. The proposed regulations now available for public comment were developed prior to the adoption of AB 3781, and do not present viable alternative monitoring methods nor specify significant local flexibility.

ANALYSIS AND COMMENT

This Department endorses the primary purpose of the Sher Bill and the draft regulations, which is to protect groundwater resources. We have experienced problems from leaky underground tanks in San Diego County and firmly support routine tank testing and monitoring for all tanks. We endorse the law's requirement of secondary containment for all new underground storage tanks. We further support the concept of encouraging owners of existing tanks to carefully evaluate their underground storage needs in view of their new responsibilities under the law and regulations. Many tank owners, we feel, will choose to either replace their existing single walled tanks with new secondary containment systems or abandon underground storage altogether.

Our major area of concern in the draft regulations is Article 4, "Existing Underground Storage Tank Monitoring Criteria". This article requires a very comprehensive, multi-faceted monitoring program for every existing underground tank, regardless of the existing or potential future uses of the groundwater or the specific hazardous material stored. This article does not provide any real alternative monitoring methods, as now required in recent amendments to the law (AB 3781), but requires the installation of essentially one multi-faceted monitoring program for all existing tanks. Further, the proposed regulations do not allow the local agency any flexibility in determining the type and extent of monitoring required for a given tank. While we strongly support the need for routine monitoring of all existing tanks, we do not believe that the high level of monitoring required in the proposed regulations is appropriate in all cases nor is it required by the law, as amended in AB 3781. To be adequate under the proposed regulations, the monitoring system must be capable of detecting active and past unauthorized releases, as well as releases that may occur in the future before groundwater is affected, and must be capable of measuring the groundwater quality directly. Each of the following monitoring methods must be implemented for every existing tank, with very limited exceptions: groundwater monitoring, vadose (unsaturated) zone well monitoring, soils testing and exploratory boring, inventory control, and tank testing. The monitoring system required is thus designed to give a very high level of confidence in detecting past, present and future leaks. This ambitious monitoring program outlined in the draft regulations is being imposed on tank owners that, for the most part, have never before been asked to monitor their tanks in any way. Tank ownership under these regulations is very expensive even when there may be no useable groundwater to protect. The State's Fiscal Impact Statement that accompanies the draft regulations provides estimates of the dollar costs to implement the regulations. (Attachment D). For existing underground storage tanks, the initial cost to the owner to comply with the proposed monitoring requirement is estimated to range from $3,600 to $14,700 per tank. Estimated annual operating costs range from $3,200 to $6,160 per tank.

An issue that needs to be addressed is the costs versus the benefits of implementing the monitoring program proposed in the draft regulations. The cost of monitoring appears to be unjustified in situations where there is no usable groundwater or where the substance stored is relatively harmless. On the other hand, the cost of monitoring may be very slight compared to the cost of cleaning up a leak from an underground tank or contaminating a water supply. Clean up costs can easily exceed $100,000 in many cases. When the tank owner is not financially able to afford the cost of clean up, the cost may be borne by the public. When a site clean up is required, however, the extent of the clean up is at least in part related to the existing and potential uses of the groundwater and the specific hazardous substance stored, whereas the monitoring systems proposed in the draft regulations are independent of groundwater quality and the hazardous substance stored.

<u>The Comprehensive Water Quality Control Plan Report, San Diego Region</u>* was developed by the San Diego Region Water Quality Control Board and approved by the State Water Resources Control Board. The report, commonly referred to as the Basin Plan, identifies the various beneficial uses of the region's water resources and establishes water quality objectives to protect those beneficial uses. The Basin Plan is presently used to some extent to determine the relative significance of a leak from an underground storage tank. In San Diego County, there are some areas where no existing nor potential future uses of the groundwater have been identified in the Basin Plan, and there are other areas with only limited uses identified. While we strongly agree that every existing tank must be monitored and that a reasonable level of confidence in the monitoring program must exist, we submit that the cost to obtain the very high level of confidence in leak detection afforded by the monitoring program proposed may not be justifiable in all areas of the County or for all materials defined as hazardous substances. The variance procedures outlined in the regulations offer the only mechanism for approval of a less comprehensive monitoring program. To apply for a variance, a tank owner must appeal directly to either the State Water Resources Control Board (for a categorical variance) or the Regional Water Quality Control Board (for a site specific variance). With a proposed processing fee of $26,000 for a categorical variance and $7,750 for a site specific variance, however, the variance procedure offers little relief for most small businesses.

Another significant point of concern with the draft regulations is contained in Section 2633 of Article 3 which details construction standards for new underground tanks storing motor vehicle fuel. The point is a technical one, but it represents a significant philosophical departure from the intent of both the law and the rest of the proposed regulations. The regulations allow that pressurized piping associated with an underground motor vehicle fuel tank equipped

* State Water Resources Control Board, San Diego Region, <u>Comprehensive Water Quality Control Plan Report</u>, March 1979.

with an automatic pressure loss detector and flow restriction device is exempt from the secondary containment standards that apply to all other systems. It has been our experience that a significant portion of leaks from underground storage systems occur in that piping. The leak detectors presently available do not prohibit flow in the event of a leak but merely reduce the flow of fuel. The fuel can still escape into the surrounding environment. Further, it is our impression that leak detectors are not very reliable and are easily altered. It, therefore, seems inconsistent that the overall intent of the law and draft regulations is to provide maximum protection of groundwater resources, and yet a significant potential source of leaks, i.e., pressurized product line, is allowed to be installed with relatively little safeguard. We recommend that the regulations be strengthened to require more stringent performance standards for the leak detection system before the piping would qualify for an exemption from secondary containment. The regulations might include a requirement that the leak detector act to terminate all product flow in the event of a leak, and/or specify actions that the operator must take when the leak detector is activated.

RECOMMENDATIONS

Staff of the Department of Health Services offer the following general recommendations on the regulations with respect to monitoring underground storage tanks. Specific technical comments on the components of the monitoring systems and on the other sections of the regulations will be addressed to the State Water Resources Control Board in a subsequent staff letter.

1) Establish monitoring requirements for existing tanks based on the existing and potential future uses of the groundwater as identified in the Basin Plan and based on the type of hazardous substances stored. We suggest that a matrix be developed with groundwater uses and categories of hazardous substances as the variables considered in determining the type of monitoring system required for a given tank.

2) Develop monitoring alternatives in compliance with Section 25292(c) of the law, as amended by AB 3781.

3) Allow the local jurisdictions, in compliance with regulations developed by the State, to approve the installation and maintenance of an interim monitoring system for an existing tank in cases where the tank owner plans and specifically commits to remove the tank(s) within a specified period of time (one to two years, for example).

4) Restructure the variance procedures and fees to allow "minor" variances from the regulations, with reduced processing fees, to be issued by the local jurisdictions and the Regional Water Quality Control Board.

5) Amend Section 2633(f) of Article 3 of the regulations to require more stringent performance standards for leak detection systems on new pressurized pipelines in order for the system to qualify for an exemption from secondary containment. The regulations should include a requirement that the leak detector act to terminate all product flow in the event of a leak and/or specify actions the operator must take when the leak detector is activated.

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/H. [illegible]

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November 16, 1984

Ms. Carole A. Onorato
Chair
State Water Resources Control Board
901 P Street
Sacramento, CA 95814

Dear Madam Chair:

On behalf of two environmental protection companies, Hunter Environmental Services, Inc., and Mallory Capacitor Company, I wish to raise several objections to the proposed regulations (Subchapter 16 of Chapter 3, Title 23, California Administrative Code) relating to underground storage of hazardous substances which are now before the Board for consideration. Our comments include three concerns: great potential for confusion amongst those who must comply with the regulations, legal interpretation, and some of the requirements themselves.

Confusion

The proposed regulations are being promulgated in accordance with the provisions of Assembly Bill 1362 (1983). However, two bills (AB 3565 and AB 3781) were enacted into law this year which substantially and materially amend AB 1362. While we understand that California state law prohibits the adoption of regulations in specific response to the two new bills until after January 1 when the new laws become effective, we believe that the Board was granted sufficient flexibility by the provisions of AB 1362 that you now have the authority to enact regulations which would conform to most of the provisions of the law as it will be amended on January 1. Would it not be far better with respect to enforcement, Board credibility, and cost efficiencies if the Borad were to anticipate the new amendments in its new regulations now than have to drastically revise them shortly after adoption? Our observations of the testimony presented by many tank owners and operators at the Board's workshop and previous hearing lead us to believe that many tank owners and operators are confused, if not angered, by the pending regulations and most seem to be completely unaware that the recent legislation will cause further regulatory changes. While we and many responsible owners and operators recognize the need for regulations which are adequate to protect California's groundwater, we also believe that the regulations should be as understandable as possible in order to achieve optimum and even enforcement. If the proposed regulations become effective in early 1985 and then are quickly amended to reflect the AB 3565 and AB 3781 amendments, considerable confusion and possible noncompliance will characterize many of those who are obliged to comply with the regulations.

If the Board, nonetheless, adopts the proposed regulations in their present form, we respectfully suggest that you consider advising all recipients of the new regulations that the regulations will soon be amended and include in that notice a description of which sections are subject to the AB 3565 and AB 3781 amendments. We believe most tank owners and operators are desirous to comply with the regulations and this action would, at least, help to minimize the confusion which will otherwise exist.

Legal Interpretation

AB 1362 does not specifically call for the use of "continuous monitoring" in any circumstances, although the law, as it will be amended by AB 3781, does. We are therefore concerned about the inclusion of an erroneous definition of "continuous monitoring" in the proposed regulations. The proposed language defines it as "a system using automatic equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout each day." As used in AB 3781, however, "continuous monitoring" refers to a "continuous leak detection and alarm system..." and, furthermore, Black's Law Dictionary (the standard reference work for legal definitions) defines "continuous" to be "uninterrupted; unbroken; not intermittent or occasional; so persistently repeated at short intervals as to constitute virtually an unbroken series. Connected, extended, or prolonged without cessation or interruption of sequence." Thus, the proposed regulation is contrary to both the requirements of AB 3781 and the standard legal definition. It does not call for an alarm nor does it necessarily require monitoring more frequently than several times per day. We think this definition will certainly need to be changed once AB 3781 becomes effective and, to avoid confusion throughout the industry, should be changed now.

Additionally, we disagree with the interpretation given some of the language of subsection (b), Section 25284.1 of AB 1362. That subsection states in part that "Alternative methods of monitoring the tank on a monthly or more frequent basis may be required by the local agency, consistent with the regulations of the board." The proposed regulations appear to interpret the "may" as "shall" inasmuch as one of the proposed alternatives calls for monthly tank testing. Although one of my clients, Hunter Environmental Services, Inc., is in the tank-testing business, we believe this alternative imposes a very costly and impractical option. We believe the Board has the authority to establish a tank-testing alternative at much less frequent intervals and respectfully suggest that as an amendment to the proposed regulations.

Requirements

We believe that the proposed monitoring alternatives are, in some instances, very specific with regard to some aspects of the law and, on the other hand, quite vague regarding others. For example, the proposed regulations are very unclear about what should be done in vadose zone monitoring while groundwater monitoring is overly specific. Quite frankly, we believe some of the monitoring alternatives detailed in the proposed regulations will place unnecessary cost burdens on tank owners and we believe that the adminstrative enforcement aspects of these regulations will be extremely cumbersome for the State. By way of example, properly installed continuous monitors around storage tanks do not necessitate the installation of groundwater monitors around these same tanks. The inclusion of groundwater monitors with source monitors is not only unnecessary for environmental protection but will also double or triple the cost of an effective installation. We have included two statements (Performance Profile of Continuous Electronic Leak Detection and Use of Monitoring Wells for Detection of Liquid Hazardous Materials) which better illustrate these points.

We believe that most of the monitoring alternatives outlined in the proposed regulations will provide suitable protection, but we also conclude that many of the combinations are more costly than necessary. In our opinion, the most cost-effective and surest method is to require initial testing of all tanks (using the standard which conforms to NFPA 329) to ensure that a tank is tight followed by the installation of a continuous monitoring system (as defined in AB 3781). This proven method is not even specified as one of the combinations of alternatives. Although we feel it should be specified as one, we believe that--in the very least--the final regulations should allow flexibility for the utilization of worthwhile existing and future technologies.

Conclusion

The intent of the Legislature and the Governor in enacting AB 1362 and its follow-up legislation has been to protect the waters of the State, the environment, and the public health. We recognize that the Board shares those goals and is attempting to adopt regulations consistent with those objectives. We therefore, urge you to:

1. Consider incorporating the provisions of AB 3565 and AB 3781 into the new regulations to the extent the law will allow,

2. Amend the regulations to correctly reflect the "continuous monitoring" provisions of AB 3781, and

3. Revise the monitoring alternatives to better represent available and future technologies.

We are hopeful you will agree that such actions best assure compliance with the intent of the new underground storage tank law.

Sincerely,

Frederick J. Taugher

Enclosures

cc: Warren D. Noteware, Vice-Chair, SWRCB
Edwin H. Finster, Member, SWRCB
Darlene Ruiz, Member, SWRCB
Kenneth W. Willis, Member, SWRCB

PERFORMANCE PROFILE OF

CONTINUOUS ELECTRONIC LEAK DETECTION

MALLORY COMPONENTS
DIVISION, EMHART INDUSTRIES, INC.

The understanding of the reliability of continuous electronic leak detection equipment has perhaps been misunderstood by legislators, regulators and users in as much as continuous detection is a relatively new concept. By way of background, the initial emphasis in the United States for continuous detection systems emulated from three different governmental agenices: The first being the United States Coast Guard which was concerned with detecting spills upon navigable waterways. Second was the National Oceanographic and Atmospheric Administration which was concerned with detecting maritime spills outside of their three mile limit. The third was the Environmental Protection Agency which was concerned with detecting visible spills on inland waterways. The attempt to establish reliable detectors for these applications has generally been considered to be a failure. What has transpired since these efforts took place, which was in the mid to late 1970's, can only be reflected through the eyes of this company and its efforts on behalf of establishing reliable leak detectors. However, I am certain that other companies within this industry will have similar stories to tell.

As a result of the unsuccessful attempts mentioned above, the Mallory Components Division of Emhart Industries, Inc. began a feasibility study regarding the development of underground leak detection systems. At that time (1978), very little was known about migration of underground toxic substances. However, through extensive testing, by acquiring inputs from various governmental agencies and by dealing with independent hydrologists and geologists, it was established that underground leaks could be reliably detected with properly configured equipment. Mallory tests in this regard substantiated this opinion. Accordingly, a full blown effort was launched to meet the needs of this industry. It is important to point out that the design of Mallory's equipment was from the direct inputs of the eventual users, i.e., major oil companies, chemical manufacturers and industrial corporations. Without detailing all of the background, it should be pointed out that since this effort has been launched, there have been literally thousands of successful installations made throughout the United States to a very broad cross-section of customers. In total, this company has now logged over 10 million hours of in-place operation for its leak detection equipment. In fairness, it must be mentioned at the outset of this effort that there were certain deficiences of product design which became apparent to this company. However, in every case these problems were dealt with quickly and correctly and are considered to be remedied within all present designs. Perhaps the best indication of these product improvements emulates from the fact that most of our customers continue to purchase our product on a routine and regular basis.

Over and above that, it is this corporation's policy to maintain continuing testing operations on all of its products in actual in-field conditions. Combining the total of in-field installations and company testing yields a failure mode of less than 1/10th of 1% of all products manufactured and installed. Installations of a more recent nature over the last year have exhibited a failure mode of less than 1/10th of 1%. While I cannot speak for other manufacturers of leak detection equipment, I think it important to point out that Mallory and its affiliated companies have been involved in the electronics business for over 60 years manufacturing products which manifest themselves in everything from radios to space shuttles, from automobiles to weapons systems and from computers to telecommunications systems. Accordingly, we are well positioned to understand what creates electrical and electronic failures and design accordingly.

Most instrumentation suffers from what is known as "infant mortality" which means that if the product is going to fail, in most cases it will fail early in its life cycle. Again, speaking only for this company, it should pointed out that every piece of instrumentation shipped has been tested under accelerated conditions for a minimum of 100 hours, thus weeding out the early failures which might occur. These tests are conducted in concert with required incoming, in-process and quality assurance checks which are conducted on a routine basis. In addition, all products are manufactured under controlled conditions to prevent static sensitive electronic devices from becoming damaged by electrostatic discharge. Of perhaps even more importance is the fact that this equipment has successfully detected leaks from underground storage facilities by a wide variety of users including oil companies, airports, trucking terminals, semiconductor houses, public utilities and the like. It should be pointed out that we would not always be informed of a leak in that this is not the type of information that most people are wanting to broadcast, however, throughout all of the millions of hours of in-field operation, we have never been informed that our equipment has ever failed to detect a leak or spill.

USE OF MONITORING WELLS

FOR DETECTION OF LIQUID HAZARDOUS MATERIALS

Prepared by

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Mallory Components Group
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USE OF MONITORING WELLS

FOR DETECTION OF LIQUID HAZARDOUS MATERIALS

SUMMARY

- Deep or shallow inspection wells can monitor for the presence of liquid hazardous materials.

- Monitoring wells for the groundwater table should be considered as a secondary means for hydrocarbon detection.

- Vadose zone monitoring wells are desireable as a primary monitoring method.

- Proper installation and site preparation guidelines can insure product detection in the vadose zone.

- Mathematical calculations or computer modeling can enhance the effectiveness of inspection wells.

- Hydraulic conductivity and soil compaction will enhance the effectiveness of monitoring wells.

USE OF MONITORING WELLS

FOR DETECTION OF LIQUID HAZARDOUS MATERIALS

Inspection or monitoring wells to detect the presence of liquid hazardous materials can be placed into 2 categories and analyzed accordingly:

1. Wells which extend below the level of the groundwater table.
2. Wells which do not extend to the groundwater table, but are in the unsaturated zone, sometimes referred to as the vadose zone.

The information contained herein has been provided by various authorities and is footnoted accordingly.

1. WELLS EXTENDING BELOW THE WATER TABLE (ACQUIFER)

The position of the water table at any one location is revealed by the level to which water rises in that particular well. The water table is usually an undulating surface that conforms in a general way to the topography of the land. The water table fluctuates seasonally, rising during rainy seasons and falling during dry periods.

"The movement of hydrocarbons downward to contact the water table usually is the most hazardous possible result of a spill on land. The degree of risk depends on the nature of the groundwater system and the extent to which it is used."[1]

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[1] The Migration of Petroleum Products in the Soil and Ground-Water, American Petroleum Institute Publication No. 4149, Washington, 1972, p. 9.

"When free hydrocarbon reaches the capillary fringe and if the volume is large enough, it first forms a layer of increasing thickness under the influence of further descending hydrocarbon. This exerts a hydrostatic pressure depressing the groundwater surface. Gravitational forces act to restore the initial water level and cause the oil pancake to move out laterally in the same direction as the groundwater (Figure 1). As shown in the inset circle, the thickness of product in the well is greater than in the adjacent formation."[2]

"This occurs because the layer of mobile product in the capillary zone is some distance above the water table. When this product encounters the open space in a well bore, it "pours" in and accumulates on the water surface. As it accumulates, its weight begins to depress the water surface. It continues to thicken until the top of the oil in the well is level with the top of the oil in the mobile layer in the acquifer. Consequently, any estimate of the total spill volume based on the oil thickness in wells will result in a considerable overestimate."[3]

A mathematical derivation of this phenomena is Shown in Figure 2, along with references. Because of this phenomena of magnification

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[2] Protection of Groundwater from Oil Pollution, CONCAWE Water Pollution Special Task Force No. 11, Publication No. 3/79, 1979, p. 15.

[3] Underground Spill Cleanup Manual, American Petroleum Equipment Institute Publication No. 1628, Washington, 1980, p. 11.

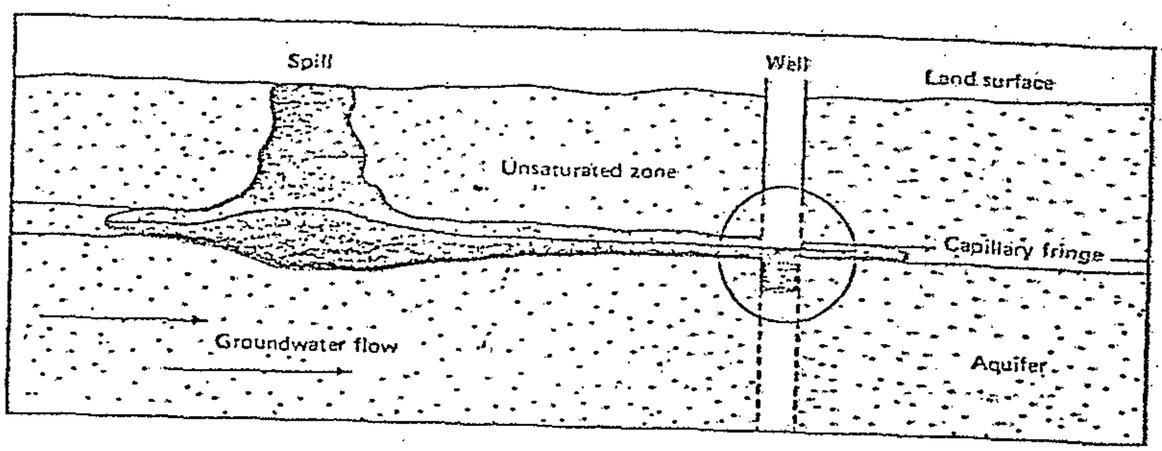
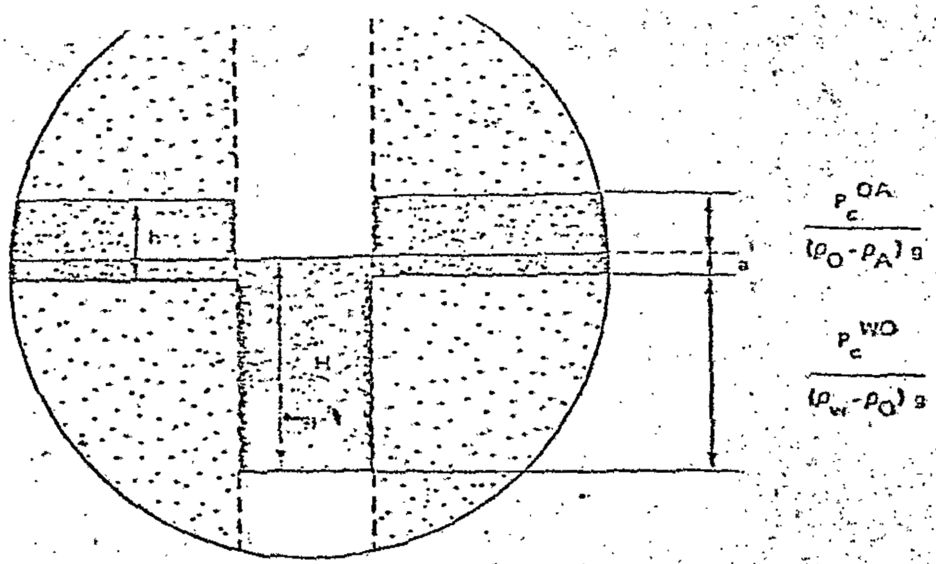

Spill
Well
Land surface
Unsaturated zone
Capillary fringe
Groundwater flow
Aquifer

Figure 1



Elementary considerations on the capillary pressures show that the oil layer thickness (H) measured in a borehole is generally different from the thickness (h) of the oil layer above the water table. For example, when the free oil layer (a) is relatively thin, but still continuous, it follows:

$$\frac{H}{h} \approx \frac{H-a}{h-a} = \frac{P_c^{WO}}{P_c^{OA}} \times \frac{(\rho O - \rho A)\,g}{(\rho W - \rho O)\,g} \approx 4\ \frac{P_c^{WO}}{P_c^{OA}}$$

in which P_c^{WO} and P_c^{OA} : pressure differences (capillary pressures) between water and oil and between oil and air respectively,

ρW, ρO, ρA : density of water, oil and air

g : acceleration due to gravity.

Although values of P_c^{WO} and P_c^{OA} can be determined by experiment or from published data (Reference 3), more often than not $P_c^{WO} \approx P_c^{OA}$ from which follows that H may be roughly four times h. Hence, any attempt to estimate the volume of oil spilled by multiplying the area of free oil on the water table by the thickness of the oil layer observed in a well will result in an overestimate being obtained.

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1. Williams, D.E. and Wilder, D.G. (1971). Gasoline Pollution of a groundwater Reservoir. A Case History. Groundwater, 9 (6), 50-56.
2. Zilliox, L. and Muntzer, P. (1975). Effect of Hydrodynamic Processes on the Development of Groundwater Pollution. Progress in Water Technology, 7, (3/4), 561-568.
3. Van Dam, J. (1967). The Migration of Hydrocarbons in a Water-bearing Struc In: The Joint Problems of the Oil and Water Industries, by Hepple, P., ed. Proc. Symposium, held at Brighton, 18-20 January 1967. The Institute of Petroleum, 55-96.

Figure 2

or amplification in the monitoring well, it is a good secondary approach for detection of hydrocarbons on the water table. As stated in Figure 1, the magnification of the oil in the groundwater well would be roughly four times the actual thickness floating on the water table.

Figure 3 shows how a groundwater monitoring well, down gradient from an underground tank, would detect a leak.

2. WELLS IN THE UNSATURATED ZONE (VADOSE ZONE)

The need to detect hydrocarbons before they reach the water table has drawn interest to vadose (unsaturated) zone monitoring. "The vadose zone is the geological profile from the ground surface to the upper surface of the principal water bearing strata. The water bearing strata is also referred to as groundwater or saturated zone. The term "vadose zone" is preferable to the often used term "unsaturated zone" for this region because saturated conditions are frequently present. The term "zone of aeration" is also often used as a synonym for vadose zone."[4]

Oil spilled on undisturbed ground will tend to simply move downward, under the force of gravity, while spreading laterally to some degree. The rate of movement depends on the viscosity of the hydrocarbon and the permeability of the soil. If the spill is a point

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[4] "Constraints and Categories of Vadose Zone Monitoring Devices," Groundwater Monitoring Review, Winter, 1984, p. 26.

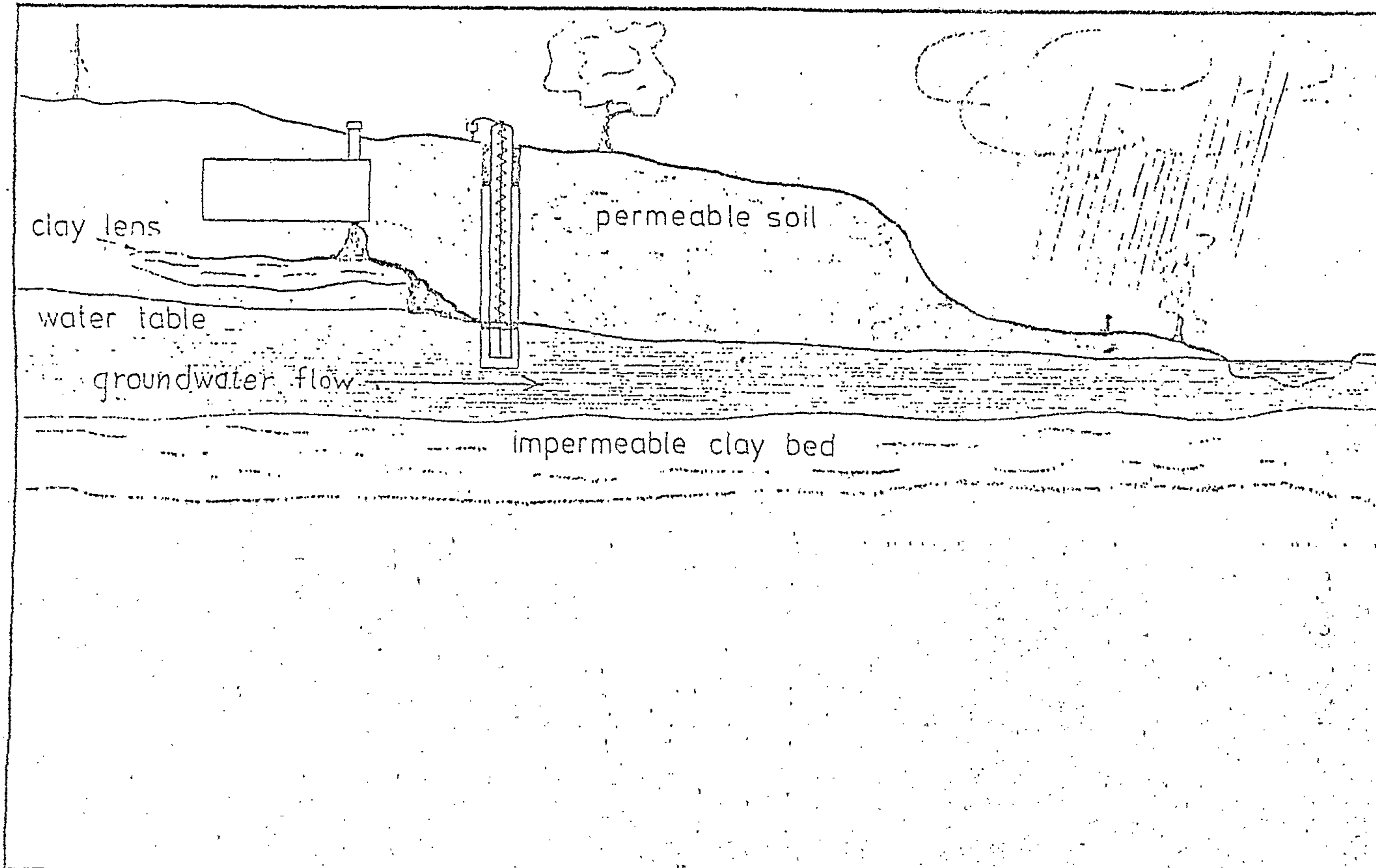
clay lens
water table
groundwater flow
permeable soil
impermeable clay bed

Figure 3

source, as in the case of a leaky underground tank, the general shape of the area of passage is a cone, modified by the nature of the soil layers the hydrocarbon passes through (Figure 4).

In the case of wells placed in the proximity of buried, underground storage tanks, the permeability of the surrounding soil must be taken into account. "In a highly permeable stratum, the penetration of the hydrocarbon is mainly vertical; in a less permeable stratum, the capillary forces play a much larger role and the penetration is more horizontal. The vertical progression may be arrested if an impermeable layer exists in the path of the hydrocarbon."[5]

An ideal way to monitor the sites of buried underground hydrocarbon storage tanks is to have the monitoring wells located in the same cavity or excavation in which the tanks were installed as shown in Figure 5. If a leak were to occur in one of the tanks, the product would move vertically until the concrete slab used for tiedowns is reached. The concrete slab can be considered an impermeable bed or lens, so that the product would have a tendency to spread laterally until it reaches immobile saturation, or if the leak continues, until it reaches and enters one of the monitoring wells.

If a concrete slab was not used in the installation, the product would still have a tendency to move laterally when the bottom of the excavation was reached, although some vertical penetration would

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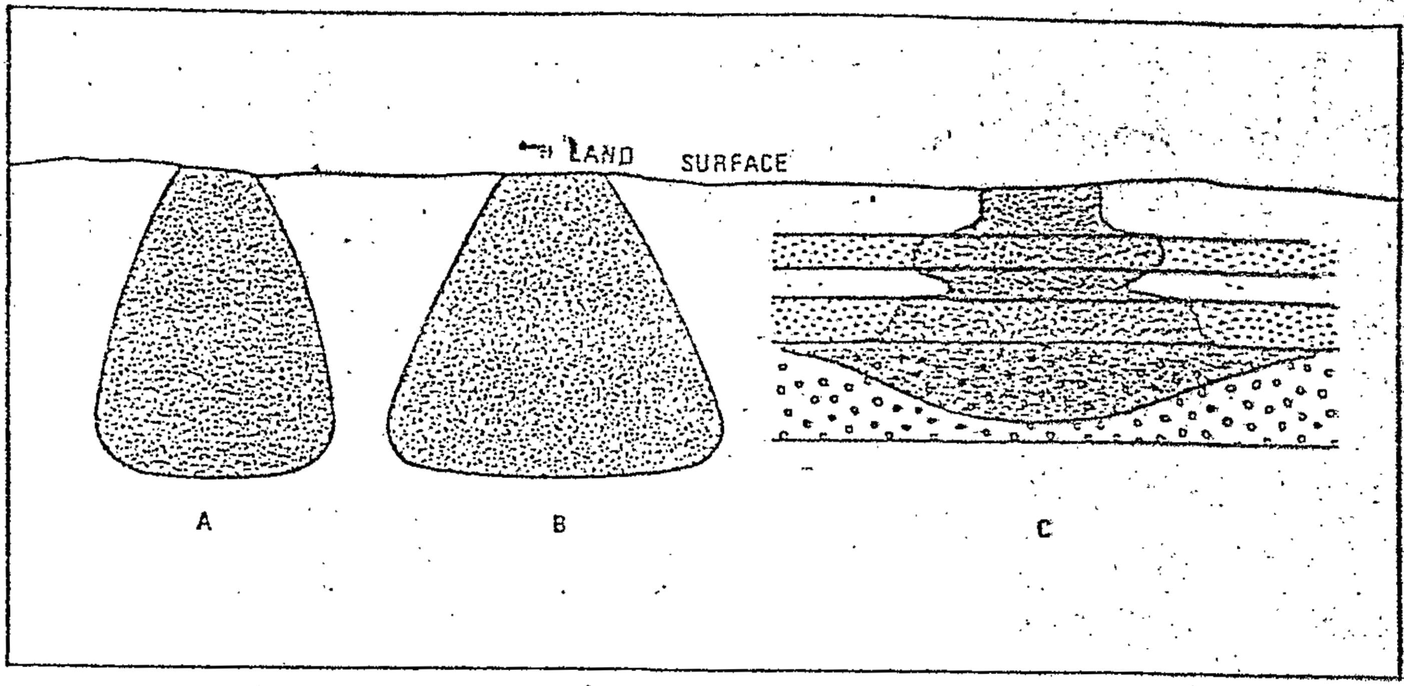
[5] Protection of Groundwater from Oil Pollution, CONCAWE Water Pollution Special Task Force No. 11, Publication No. 3/79, 1979, p. 15.



GENERALIZED SHAPES OF SPREADING CONES AT IMMOBILE SATURATION

A — HIGHLY PERMEABLE, HOMOGENEOUS SOIL
B — LESS PERMEABLE, HOMOGENEOUS SOIL
C — STRATIFIED SOIL WITH VARYING PERMEABILITY

REFERENCES

1. American Petroleum Institute (API) (1972). The Migration of Petroleum Products in the Soil and Groundwater. Principles and Countermeasures. API Publication No. 4149, p. 8.

2. CONCAWE Water Pollution Special Task Force No. 11. (1979). Protection of Groundwater from Oil Pollution. Report No. 3/79 p. 12.

Figure 4

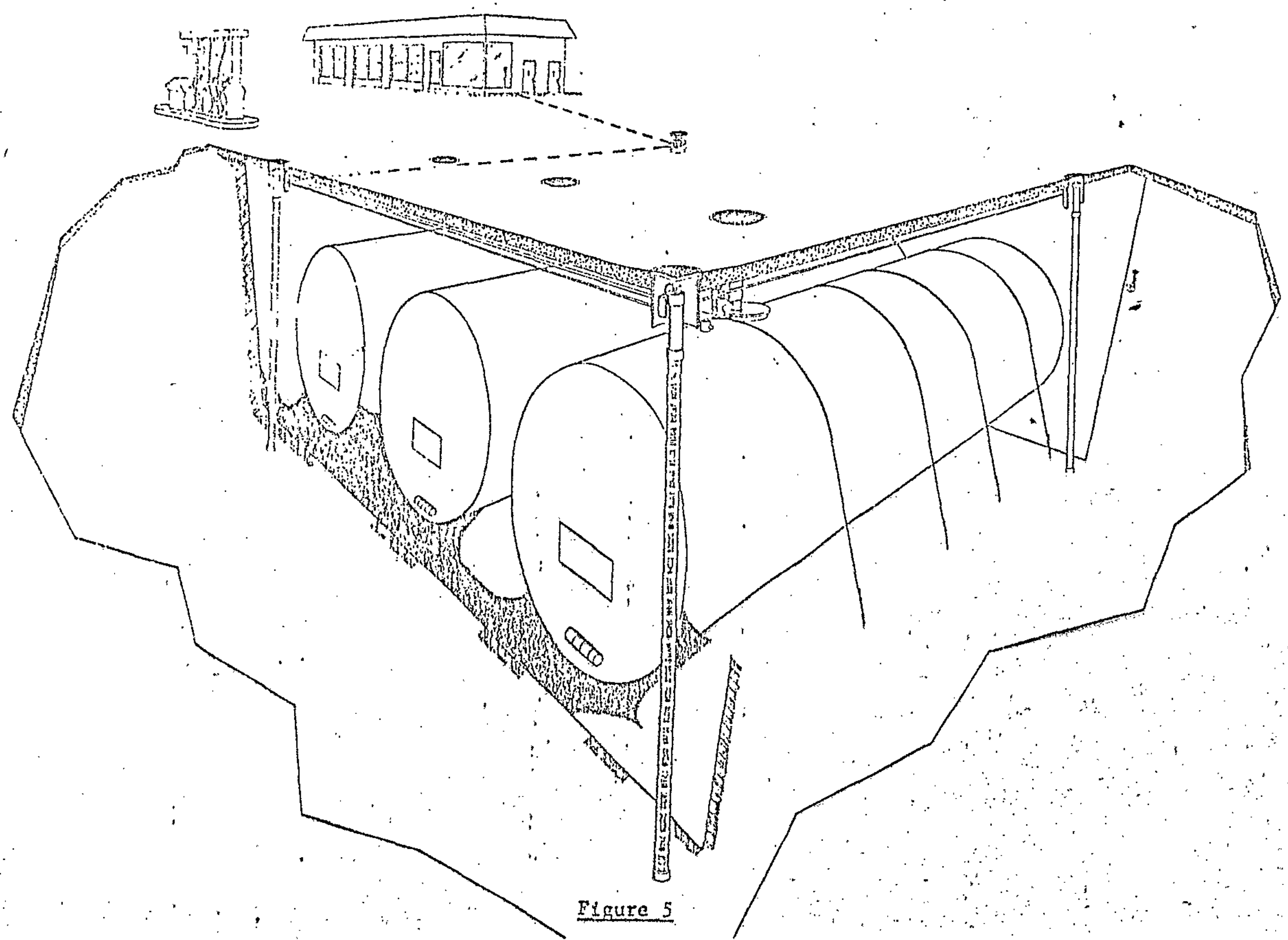


Figure 5

continue in this case. "SPILLED OIL COMMONLY MIGRATES ALONG ARTIFICIAL FILLS, SUCH AS PIPELINE TRENCHES, FOUNDATION FILLS, AND UTILITY CONDUITS, IN A MANNER SOMEWHAT RELATED TO ITS BEHAVIOR IN NATURAL SOILS. SUCH EXCAVATIONS OFTEN ARE BACKFILLED WITH MATERIAL MORE PERMEABLE THAN THAT REMOVED. THESE EXCAVATIONS CONSEQUENTLY OFFER A MIGRATION ROUTE OF MINIMUM RESISTANCE, AND ANY FLUID WILL TEND TO MOVE ALONG THEM MORE RAPIDLY THAN THROUGH NATURAL SOILS."[6]

These claims can be further substantiated by analyzing the industry standards when tanks are installed. "Backfill below, around and above tanks should be clean, noncorrosive porous material, such as clean washed sand or gravel for steel tanks and, for FRP (fiberglass reinforced plastic) tanks, must be in accordance with manufacturer's specification."[7]

"Fiberglass reinforced plastic (FRP) tanks should be installed using bedding and backfill of either pea gravel or stone/gravel crushings. If pea gravel is used, it must be clean naturally rounded aggregate with a mix of particle sizes with diameters not less than 1/8 of an inch or more than 3/4 of an inch. If stone/

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[6] The Migration of Petroleum Products in the Soil and Groundwater, American Petroleum Institute Publication No. 4149, Washington, 1972, p. 9.

[7] Installation of Underground Petroleum Storage Systems, American Petroleum Institute Publication No. 1615, Washington, 1979, p. 4.

gravel crushings are used, they should be washed and free flowing, with angular particle sizes not less than 1/8 of an inch nor more than 1/2 of an inch."[8]

With these facts in mind, please reference the tables in Figure 6, giving representative values of hydraulic conductivity (often refered to as permeability). The numbers show that the least resistance to the movement of liquids would be in coarse, medium or fine gravel. The best situation would be if the excavation were made in clay, as its permeability value would classify it as an impermeable lens, so that at the transition interface between the gravel and the clay, the only movement of leaking product would be in a lateral direction, towards the monitoring wells.

The next closest porous substance to gravel, as shown on the table, is sand. Sand has a permeability of 1/10 to 1/4 that of gravel, so that even in a gravel/sand interface, the lateral movement will be considerably greater in the gravel than the vertical movement in the sand. In the case of underground leaks, this would insure that the migrating product would reach the inspection well(s) located within the confines of the burial cavity. The product migration and penetration of spilled product into the soil is a function of the volume discharged. The vertical component is due to gravity while the horizontal component is due to capillarity. For

[8] Recommended Practices for Underground Storage of Petroleum, New York State Department of Environment Conservation, Albany, New York, 1984, p. 31.

Conductivity

(after Morris and Johnson, 1967)

Material	Hydraulic Conductivity, m/day ft/day	m/day	Type of Measurement[a]
Gravel, coarse	490	150	R
Gravel, medium	850	270	R
Gravel, fine	1,500	450	R
Sand, course	150	45	R
Sand, medium	40	12	R
Sand, fine	8.2	2.5	R
Silt	0.62	0.08	H
Clay	0.00066	0.0002	H
Sandstone, fine-grained	0.66	0.2	V
Sandstone, medium-grained	10	3.1	V
Limestone	3	0.94	V
Dolomite	0.0033	0.001	V
Dune sand	66	20	V
Loess	0.26	0.08	V
Peat	19	5.7	V
Schist	0.66	0.2	V
Slate	0.00026	0.00008	V
Till, predominantly sand	1.6	0.49	R
Till, predominantly gravel	100	30	R
Tuff	0.66	0.2	V
Basalt	0.033	0.01	V
Gabbro, weathered	0.66	0.2	V
Granite, weathered	4.6	1.4	V

[a]H is horizontal hydraulic conductivity, R is a repacked sample, and V is vertical hydraulic conductivity.

FIGURE 6

a major leak the capillary forces play a much larger role than gravity and the soil penetration is more horizontal. In a small leak this penetration will be more vertical.

While the mathematics of hydraulic conductivity prove that properly installed monitoring wells will contact and collect spilled product, it is recommended that good business practices be considered in areas where soil permeability is very high. For example, underground tanks should never be left to "free float" in sandy excavations as settling and other hydraulic pressures will cause the tank to shift and possibly rupture. Normally, tiedowns and concrete slabs are used to provide stability which further serves to channel spilled product towards the monitoring wells.

CONCLUSION

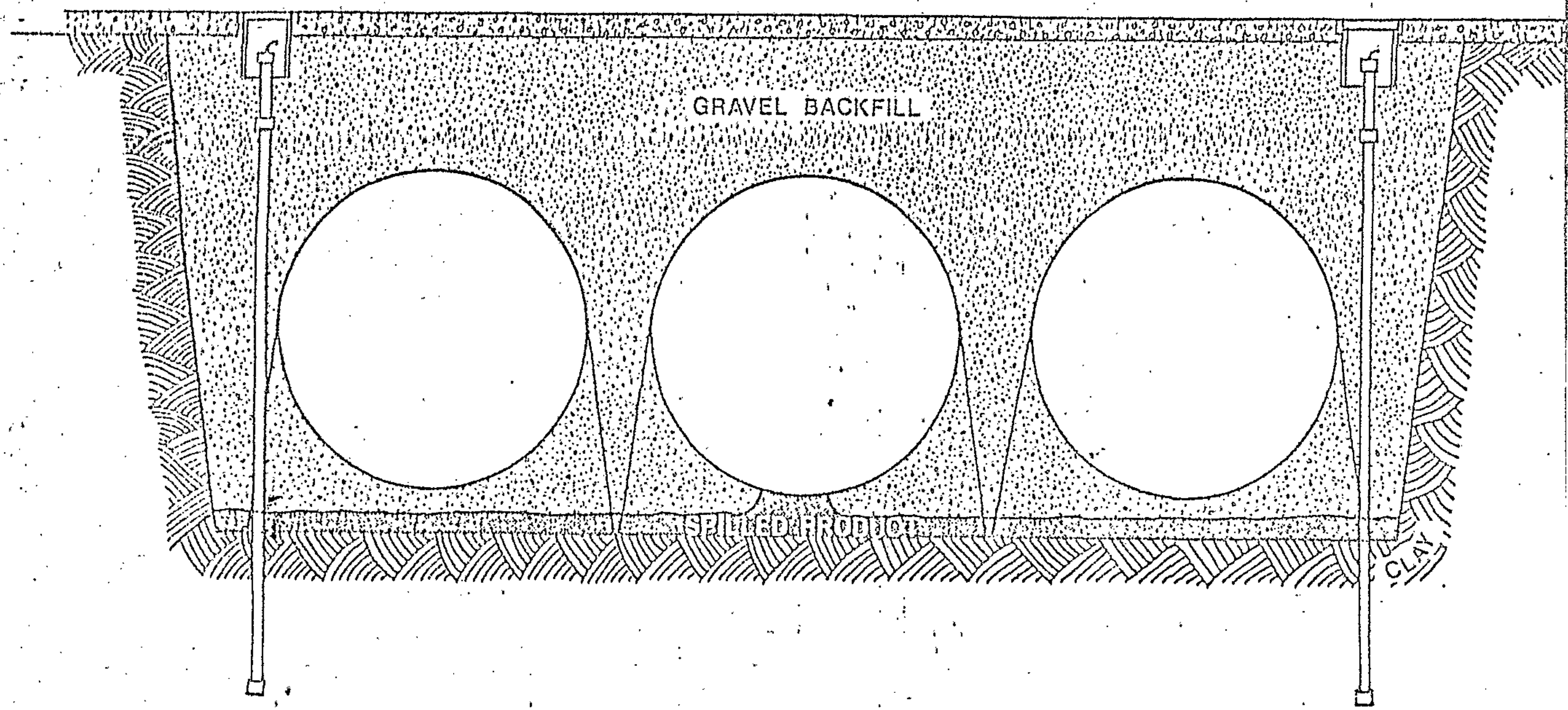
The use of wells to monitor for hydrocarbons on the water table should continue to be used as a secondary means to detect hydrocarbon leaks. Such wells would also serve double-duty as they could then be used with pumps to form cones of depression to contain the leaking product until recovery operations could be put into effect.

The primary methods of monitoring should be in the vadose zone in order to detect the hydrocarbon leak as close to the point source as possible. Monitoring in the vadose zone requires that each installation be evaluated individually, in a retrofit situation. When the geology of the area and the mechanics of the tank installation are considered, it will insure that the leaking products will find their way into the monitoring wells before they reach the water table.

If a concrete slab was used in the tank installation, it would act as an impermeable layer, inhibiting vertical movement and forcing lateral movement to the wells.

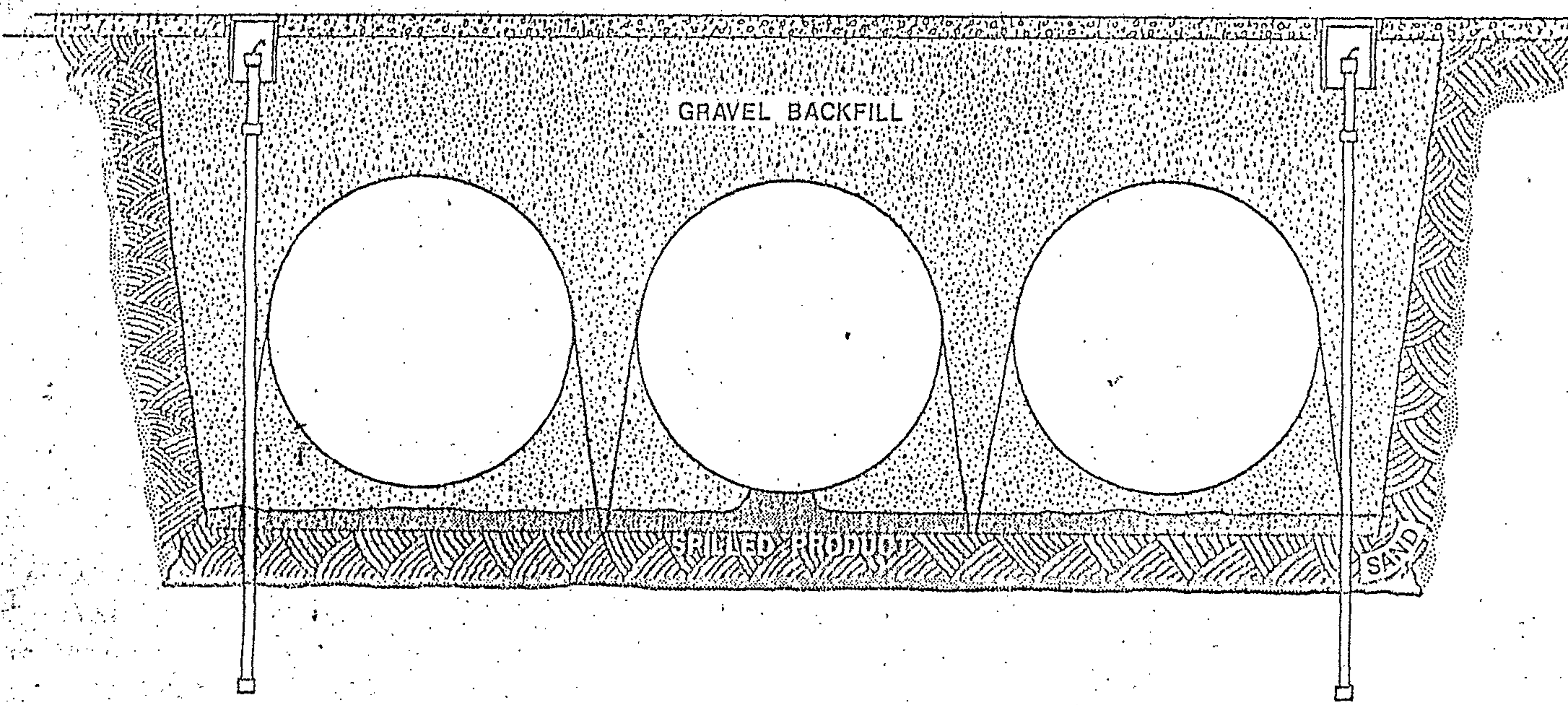
What if the installation did not use a concrete slab for the tank tiedowns? The next best situation is where the tank excavation is in a clay soil, and no concrete slab exists (Figure 7). Again, the monitoring wells extend several feet below the gravel/clay excavation interface. Using the values from the permeability table mentioned previously, the clay soil is considered to be a continuous impermeable layer, and again would inhibit vertical movement of the leaking hydrocarbon and force the lateral movement towards the wells.

The least desirable situation is shown in Figure 8. Here the excavation is in sandy soil and no concrete slab or other impervious barrier exists. Looking at the permeability values of gravel versus sand, the mobility of the hydrocarbon in the gravel backfill will be 3.5 to 10 times faster than in sand. Figure 8



CLAY SOIL, GRAVEL BACKFILL

FIGURE 7



SANDY SOIL, GRAVEL BACKFILL

FIGURE 8

depicts such a situation, where the vertical movement of the leaking product is moving laterally in the more permeable gravel backfill, towards the monitoring wells. Refering back to Figure 4, we see the same situation depicted in Example C, where product is passing through stratified soil with varying permeability.

Finally, one must address the detection time of monitoring wells. The rate of movement of leaking product will be a function of the size of the leak, and the residual saturation of the tank backfill.

The residual saturation is defined as the minimum content which a fluid has to attain in order to move in a porous medium (or alternatively, the threshold below which it is no longer able to move). It is a non-dimensional parameter, and can be expressed as retention capacity R. Figure 9 gives the mathematical formula for determining retention capacity, as well as typical values for various types of soil.

Let us take an example and plug in the values in the formula in Figure 9. Assume a leak rate of 2 gallons/day of gasoline:

Accumulation in 1 day = 2 gallons = 0.008 m^3

Accumulation in 1 week = 14 gallons = 0.053 m^3

Accumulation in 1 month = 420 gallons = 1.59 m^3

Accumulation in 1 year = 5040 gallons = 19.08 m^3

The above accumulations would be the volumes of infiltration (V). Assume an area of infiltration (A) of 1 m^2 (point source tank leak)

The maximum depth of penetration can be estimated from the following formula:

$$D = \frac{1000\ V}{A \times R \times k}$$

where D = Maximum depth of penetration, m
V = Volume of infiltration oil, m^3
A = Area of infiltration at surface, m^2
R = Retention capacity of soil, in litres per cubic metre (l/m^3)

"k" is an approximate correction factor for various oil viscosities

k = 0.5 for low viscosity petroleum products, e.g. gasoline
k = 1.0 for kerosine, gasoil and products with similar viscosities
k = 2 for more viscous oils such as light fuel oil.

Typical values for retention capacities of porous soils are given below:

Typical Values for Retention Capacities of Porous Soils are given below (ref. 9)

Soil	R Oil Retention Capacity l/m^3
Stone, coarse gravel	5
Gravel, coarse sand	8
Coarse sand, mdium sand	15
Medium sand, fine sand	25
Fine sand, silt	40

REFERENCES

1. CONCAWE (1974). Oil Spill Clean-up Manual. CONCAWE Rep. No. 4/74, The Hague.

Figure 9

and compare the penetration depth of soils composed of stones and course gravel against fine sand to silt type soils. Following are the calculated results:

DEPTH PENETRATION

Time Period	Stone, Coarse Gravel	Fine Sand, Silt
1 day	3.2 meters (10.5 ft.)	0.4 meters (1.3 ft.)
1 week	21.2 meters (69.6 ft.)	2.7 meters (8.7 ft.)
1 month	636 meters (2086.7 ft.)	79.5 meters (260.8 ft.
1 year	7632 meters (25,040.6 ft.)	954 meters (3130.1 ft.

Again, notice the large difference in depth of penetration, because of the increased mobility of product in gravel versus sand. These calculations show that when spilled product travels through gravel and hits sand, which is less porous, a form of barrier is created and increased horizontal migration will take place. The less permeable the barrier, the greater the horizontal movement.

The use of wells for monitoring for hazardous chemicals is fast becoming an accepted discipline. Combining geology, hydrology, and computer technology, several groups are attempting to carry the state-of-the-art one step further by mathematically defining the many variables involved in groundwater modeling. These basic coefficients are then measured in the field for a given geographical location and then inputted into a personal computer using special software. The software gives a two or three-dimensional display of the movement of hazardous products through the vadose zone and on the groundwater. Figures 10 and 11 show a two-dimensional display of a ficticious spill and the spread of the plume over a

```
///////////BASIC TRANSPORT COEFFICIENTS\\\\\\\\\\\

      TRANSMISSIVITY (GPD/FT) =  50000  GPD/FT
      STORAGE COEFFICIENT     =  .01
      HYDRAULIC CONDUCTIVITY =  1000  GPD/SQ.FT.
      POROSITY =  .2
      LONGITUDINAL DISPERSIVITY=  20
      TRANSVERSE DISPERSIVITY (FT)= 5
      RETARDATION COEFFICIENT =  1.2  FT
      REGIONAL X FLOW (FT/DAY) =  1
      REGIONAL Y FLOW (FT/DAY)=  1

/////////////////////////////\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\


//////////////////////////PARTICLES\\\\\\\\\\\\\\\\\\\\\\\


      PARTICLES IN A RECTANGLE
         COORDINATS:
         LOWER LEFT CORNER (X,Y) =  0 , 0  FT
         UPPER RIGHT CORNER (X,Y) =  100 , FT
         NUMBER OF PARTICLES =  10

   TOTAL SYSTEM PARTICLES =  10
  \\\\\\\\\\\\\\\\\\\\\\\\\/////////////////////////////
/////////////////////////PARTICLE MAPPING\\\\\\\\\\\\\\\\\\\\\\\\\
    MAP WINDOW LOCATION
  LOWER-LEFT COORDINATES =  0 , 0 FT
    UPPER-RIGHT COORDINATES =  100 , 100 FT
    CELL SIZE (CDX,CDY) = 100 , 100 FT

    SIMULATION TIME =  0  DAYS
          0
     ----:----:
 100:     4    6
   0:     0    0

     (-1:PUMPING WELL, -2:INJECTION WELL)

  \\\\\\\\\\\\\\\\\\\\\\\\\\///////////////////////////////
```

Figure 10

and compare the penetration depth of soils composed of stones and course gravel against fine sand to silt type soils. Following are the calculated results:

DEPTH PENETRATION

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					400		600		800		1000
1000	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	2	0	2	0	0	0
500	0	0	0	0	2	1	2	2	0	0	0
400	0	0	2	3	3	1	0	0	0	0	0
300	0	0	3	5	3	2	0	0	0	0	0
200	0	1	5	3	1	0	0	0	0	0	0
100	3	4	2	0	0	0	0	0	0	0	0
0	5	2	1	0	0	0	0	0	0	0	0

(-1:PUMPING WELL, -2:INJECTION WELL)

\\//////////////////////////////

PRESENT SIMULATION TIME = 600 DAYS
INCREMENTAL SIMULATION TIME = 120 DAYS

DMAX = 100 FT

NP= 60

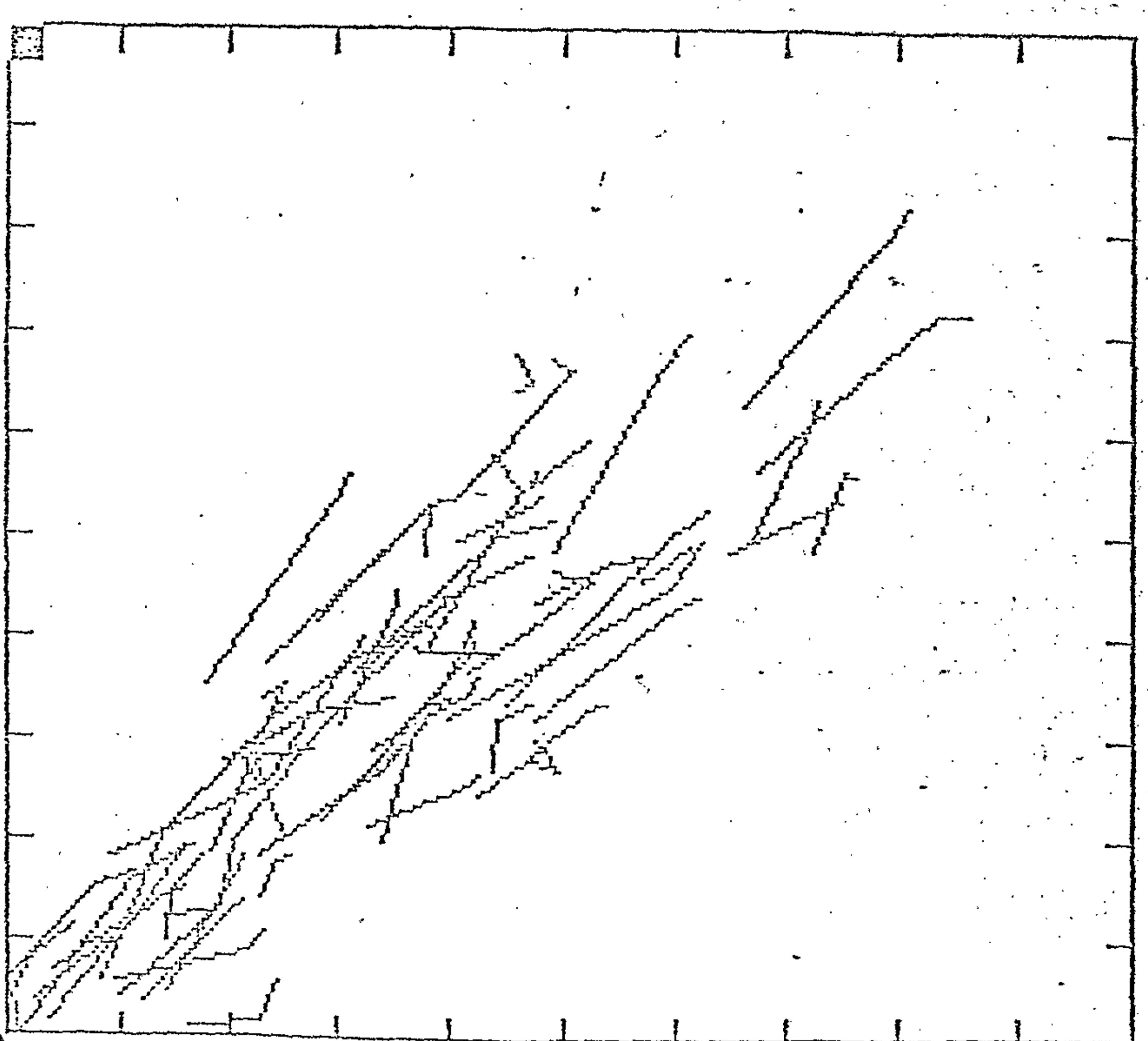

Figure 11

No.	Author(s)	Contact Address	Model Name (Last Update)	Model Description	Model Processes	IGWMC Key
1	S.W.Ahlstrom H.P.Foote R.J.Serne	J.F.Washburn Battelle Pacific NW Labs P.O. Box 999 Richland, WA 99352	MMT-DPRW (1976)	To predict transient, three-dimensional movement of radionuclides and other contaminants in saturated/unsaturated aquifer systems	advection dispersion diffusion adsorption decay chemical reactions ion exchange dissolution-precipitation	0750
2	R.G.Baca	Rockwell Hanford Operations P.O. Box 250 Richland, WA 99352	FECTRA (1977)	A two-dimensional, vertical model to simulate steady or unsteady transport for a given velocity field in saturated or unsaturated porous media	advection dispersion diffusion adsorption decay	0790
3	H.C.Burkholder M.O.Cloninger W.V.Demier G.Jansen P.J.Liddell J.F.Washburn	Natl. Energy Software Center* Argonne Natl. Laboratory 9700 S. Cass Avenue Argonne, IL 60439 Tel: 312/972-7250	GETOUT (1979)	To predict migration of radionuclides to biosphere using a steady-state, homogeneous, isotropic, saturated model of the geosphere	advection dispersion diffusion adsorption ion exchange decay	2080
4	L.A.Davis	Waste and Land Systems, Inc. 1501 Lemay Ave., Ste.207 Ft. Collins, CO 80524	SEEPV (1980)	A transient flow model to simulate vertical seepage from a tailings impoundment, including saturated/unsaturated modeling of impoundment with liner, and underlying aquifer	advection	2290
5	J.O.Duguid M.Reeves	G.T.Yeh Oak Ridge Natl. Lab. Environmental Sciences Division Oak Ridge, TN 37830 Tel: 615/574-7285	Dissolved Constituent Transport Code (1976)	Transient, two-dimensional model for calculation of vertical solute transport through porous media with given velocity field	advection dispersion diffusion adsorption decay	2590
6	G.R.Dutt M.J.Shaffer W.J.Moore	Bureau of Reclamation U.S. Dept. of Interior 715 S. Tyler, Suite 201 Amarillo, TX 79101	Salt Transport in Irrigated Soils (1976)	A transient one-dimensional, vertical simulation of solute transport in the unsaturated zone, coupled with a chemistry model	ion exchange reactions	2950
7	D.R.Friedrichs C.R.Cole R.C.Arnett	D.R.Friedrichs Battelle Pacific NW Labs P.O. Box 999 Richland, WA 99352 Tel: 509/376-8528/8451	PCP (1977)	An advective transport model which calculates times of travel and paths along an unconfined aquifer by given potential surface	advection	2110
8	S.K.Gupta K.K.Tanji J.N.Luthin	Univ. of California at Davis Land, Air & Water Resour. Water Science & Engineering Section Davis, CA 95616 Tel: 916/752-0453	DAVIS/FE3D (1975)	Three-dimensional, unsteady model for prediction of piezometric head and salt transport in large, natural, multi-aquifer basins	advection diffusion	1590

Figure 12

USE OF MONITORING WELLS

FOR DETECTION OF LIQUID HAZARDOUS MATERIALS

ACKNOWLEDGEMENTS

Figure 6 courtesy of Thomas A. Prickett and Associates, #8 Montclair, Urbana, IL 61806

Figure 10, 11 courtesy of Thomas A. Prickett and Associates

Figure 12 courtesy of the International Groundwater Modeling Center, Holcomb Research Institute, Butler University, Indianapolis, IN 46208

#18

PUBLIC POLICY ADVOCATES

FREDERICK J. TAUGHER

1100 11th Street, Suite 311
Sacramento, California 95814
Telephone 916 441 0702

October 22, 1984

HAND DELIVERED

Mr. Harold J. Singer
Division of Technical Services
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Subject: Comments on Proposed Regulations Governing Underground Storage of Hazardous Substances

Dear Mr. Singer:

These comments are being submitted on behalf of Hunter Environmental Services, Inc., and the Mallory Components Division of Emhart Industries, Inc. For your reference, Hunter provides underground tank testing services and Mallory manufactures continuous electronic monitoring equipment; each company has several years of experience in underground tank leak detection and monitoring.

Before addressing the proposed regulation as published August 23, 1984, we believe it is important to acknowledge the recent passage of new legislation, AB 3781 and AB 3565. As you know, these bills include changes to the sections of the existing law for which the Board is currently developing the subject regulations; these are also the sections on which we wish to comment.

The changes which are of specific interest are as follows:

- New Tank Construction and Monitoring Standards

  - An underground storage tank with a primary container constructed with a double complete shell shall be deemed to have met the reqirements for primary and secondary containment set forth if the outer shell is constructed primarily of non-earthen materials, including, but not limited to concrete, steel, and plastic, which provide structural support; a continuous leak detection system with alarm is located in the space between the shells; the system is capable of detecting the entry of hazardous substances from the inner container into the space; and the system is capable of detecting water intrusion into the space from the outer shell.

  - Before the underground storage tank is placed in service, the underground storage systems shall be tested in operating condition using a precision test as defined in National Fire Protection Association Pamphlet 329, "Recommended Practice for Handling Underground Leakage of

Flammable and Combustible Liquids,", as amended, proving the integrity of an underground storage tank.

- Existing Underground Storage Tank Monitoring Criteria

  The following monitoring methods are added to the included alternatives:

  - Precision Testing as defined in National Fire Protection Association Pamphlet 329, "Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids,", as amended, for proving the integrity of an underground storage tank and piping system at time intervals specified by the Board.

  - A continuous leak detection and alarm system which is located in monitoring wells adjacent to an underground storage tank and which is approved by the local agency.

  - For monitoring tanks containing motor vehicle fuels, daily gauging and inventory reconciliation by the operator, if all of the following requirements are met:

    (A) Inventory records are kept on file for one year and are reviewed quarterly.
    (B) The tank is tested, using the Precision Test as defined in National Fire Protection Association Pamphlet 329, "Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids,", as amended, for proving the integrity of an underground storage tank at time intervals specified by the Board and whenever there is a shortage greater than the amount which the Board shall specify by regulation.
    (C) If a pressurized pump system is connected to the tank system, the system has a leak detection device to monitor for leaks in the piping.

- Allowable Repairs

  - Before the tank is placed back into service following the repair, the tank is tested in the operating condition, using the Precision Test as defined in National Fire Protection Association Pamphlet 329, "Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids,", as amended, for proving the integrity of an underground storage tank.

  - The Board shall, by regulation, require that monitoring systems be installed when an allowable repair is made. "Monitoring System" shall refer to a continuous leak detection and alarm system which is located

PUBLIC POLICY ADVOCATES

in monitoring wells adjacent to an underground storage tank and which is approved by the Board.

As mentioned, the changes made with the recent legislation address many of the areas of concern on which we intend to comment; we will therefore, as applicable, refer back to the referenced areas in our subsequent comments. Since there are several sections in which we wish to comment, we will address them in numerical order as they appear in the proposed regulations:

Article 3. Section 2632(e)

It is felt that it is not necessary to differentiate between a secondary containment area which would normally contain water and one which would not. Technology is available to detect and differentiate water versus hazardous substances as well as "preset" for pre-existing levels. The language used in this section may be too restrictive to available technology. Please refer to the enclosed paper, "Underground Leak Detection of Petroleum Products, Gas Vapor Detection versus Pollulert".

Article 3. Section 2632(f)

As already stated, new law specifically addresses double wall tank construction and monitoring requirements. In addition, the reference to a "pressure sensor" may be too restrictive to other acceptable sensing devices not utilizing pressure for detection.

Article 3. Section 2633(f)

Specification of a pressure loss detection and flow restriction device may be too restrictive to other available technologies. NOTE: This comment would also apply to the following subsequent sections: 2634(a)4, 2642(h).

Article 3. Section 2634(a)(3)

Use of the term "hydrostatic" to describe the method of testing is not in agreement with the referenced new legislation. The method of testing referenced is the Precision Test as per NFPA 329. Please refer to the enclosed "Update of NFPA 329" and Pamphlet 329 which specifically exclude hydrostatic testing as a conclusive test method.

Article 3. Section 2634(d)

The published American Petroleum Institute guideline publication 1632 for inventory control specifies the generally accepted criterion for inventory control procedures and failure. The same comment applies to Section 2643 in its entirety.

PUBLIC POLICY ADVOCATES

Article 3. Section 2635(General)

The criterion required are very specific and may preclude some acceptable technology. It is suggested that language be added to allow "other methods acceptable to the local agency".

Article 3. Section 2635(3)

As previously stated, the use of the terms hydrostatic and pressure in describing proper test procedures are not consistent with the requirements of NFPA 329. If it is the intent of this subsection to require installation testing before the tank system is covered, enclosed or placed in service, then the proper reference would be Section 2-7 of NFPA 30.

Also, as previously stated, new legislation also requires NFPA 329 Precision Testing in the operating condition before the system is placed in service.

Article 4. (General)

As previously stated, new law specifies the alternative monitoring method of a continuous leak detection and alarm system which is located in monitoring wells adjacent to an underground storage tank and which is approved by the local agency.

We would be happy to provide detailed criterion in the format of Sections 2642-2646 with respect to the intent of this alternative. It is suggested that the alternative may best be considered as an option to Sections 2645 and 2646.

For your information, we have enclosed "Performance Profile of Continuous Electronic Leak Detection" to illustrate the state of the technology.

Article 4. Section 2642(b)(2)

The term "significant"is open to wide interpretation. In addition, it is suggested that since testing as per subsection(c) is the only conclusive way to determine tank integrity, whether or not excavation is required should be irrelevant.

Article 4. Section 2642(c)

Although the variables listed are generally accepted as the key variables in conducting a conclusive tank integrity test, it is suggested that the reference to the NFPA 329 Precision Test (as indicated in AB 3781) would be advisable in lieu of extraction of variables. The main purpose served by this reference would be the acknowledgement of the NFPA document and inclusion by

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reference of the detailed language in the document (which more substantially expresses the test criterion).

Article 6. (General)

As previously stated, new law makes extensive changes to the allowable repair requirements with respect to the determination of whether a repair can be allowed, whether the repair has been properly performed, whether the repaired tank is not leaking upon return to service and for future early leak detection once returned to service.

The two areas of concern referenced previously are inclusion of Precision Testing in the operating condition and the specification that the board develop regulations requiring continuous leak detection and alarm systems which are located in monitoring wells adjacent to an underground storage tank.

Article 6. Section 2663(a)

New law deletes the requirement for NFPA 30 installation testing because it is inappropriate since the tank system would have to be totally excavated in order to accomplish the testing.

Both Hunter and Mallory would be happy to discuss their comments in more detail at your convenience. If you have any questions or require any additional information, please do not hesitate to call me at (916) 441-0702 or Joyce A. Rizzo of Hunter at (800) 523-4370 with respect to testing, or Hugh M. Peters of Mallory at (317) 856-3857 with respect to monitoring.

Enclosures

- Underground Leak Detection of Petroleum Products, Gas Vapor Detection versus Pollulert.
- Update of NFPA 329
- NFPA 329 Pamphlet
- Peformance Profile of Continuous Electronic Leak Detection

Sincerely,

Frederick J. Taugher

Enclosures

cc: J.A. Rizzo, Hunter Environmental Services, Inc.
H.M. Peters, Mallory

UNDERGROUND LEAK DETECTION OF PETROLEUM PRODUCTS
GAS VAPOR DETECTION VS. POLLULERT

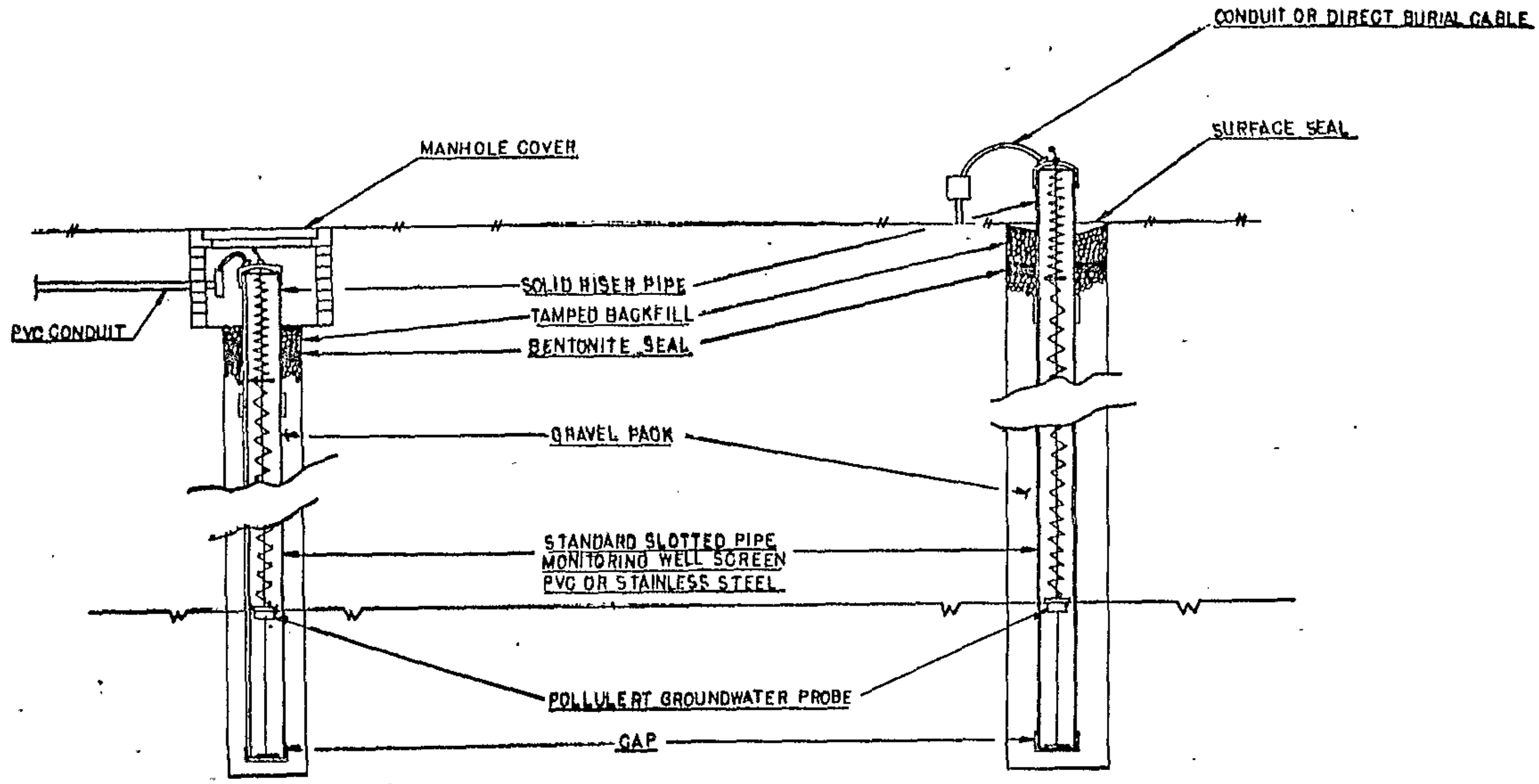
The Pollulert Underground Leak Detection System is a new technology developed to specifically address an application in a new market. That application is to continuously monitor underground as well as above-ground storage tanks for leaks and spills. Recently, there have been attempt to adapt an "old" technology, gas vapor detectors, to this new application; and this has created some confusion about the why and how of underground leak detection.

The Application - The Gasoline Service Station

The purpose in monitoring an underground storage facility is to sound an alarm or warning when the concentration (layer or thickness) of product exceeds some predetermined point in a monitoring well. The motivation is to take corrective action before major recovery is required or before the product gets off of the service station's property. Any facility which continuously stores product probably has some amount of product spilled or leaked into the ground around the storage area. The objective of underground leak detection in a service-station application is not if product has leaked, but how much has leaked and accumulating. The appearance of a sheen of product in a monitoring well might be normal, but a layer of 1/4 inch is an indicator of a real problem deserving maintenance attention.

In order to understand the concepts of underground monitoring, a thorough understanding of how a "typical test (monitoring) well" function is necessary.

NOTE: For proper well construction, please refer to API Publication 1628 or see drawing provided by Pollulert Systems on the next page.



UNDERGROUND INSTALLATION
(GASOLINE STATION)

ABOVE GROUND INSTALLATION

FIGURE 1

DO NOT SCALE DRAWING

TOLERANCE UNLESS OTHERWISE SPECIFIED:

NOTE: REMOVE ALL BURRS AND SHARP EDGES TO .010 MAX. RADIUS UNLESS OTHERWISE SPECIFIED.

POLLULERT SYSTEMS

MALLORY COMPONENTS GROUP, DIVISION OF EMHART INDUSTRIES, INC.
INDIANAPOLIS, INDIANA U.S.A.

TITLE: TYPICAL GROUNDWATER PROBE INSTALLATIONS

DRAWN BY R. PERRY	CHECKED - DATE	APPROVED - DATE
DATE 2-23-82	EQUIPMENT DRAWING NO.	
SCALE NONE		

The typical well depth is 25 feet. Two situations must be considered.

1) The first is that the water table is below the bottom of the well. In this case the monitoring well is a source monitor. As product leaks and continues to saturate soil in an ever-increasing, conical spread, it will encounter the monitoring well. The well will appear to the product as an area of relief, and the product will pour into the well. As previously mentioned, when the depth or layer of product reaches some predetermined level (Ex.: 1/4 inch), the responsible person should be automatically notified.
2) The second situation to be considered is that the bottom of the monitoring well is below the top of the water table. Water is constantly "standing" in the well. As product arrives at the well, it actually depresses the level of water in the well and accumulates in a far greater depth or layer than it is outside the well. Recent estimates are that there are four times the depth in the well than on the water's surface outside the well.

In the first of the above situations it is important to note that the environment in the well is one of a potentially changing water level. In both of the above situations, the well will be saturated with humidity. An underground well has a thermal effect; that is to say, moisture is continually being swept from the bottom of the well to the top. It is common when removing the well cap to see condensate running out of the cap.

In a properly constructed monitoring well, water level should not vary significantly; however, a variance of $\pm$ 4 feet should be anticipated.

To conclude, the monitoring well is an accumulator used as a source of a groundwater monitor. Detection is desired when the depth or layer of product in the well exceeds some predetermined point (Ex.P 1/4 inch). The environment inside the well is one of very high humidity and potentially changing water level.

Gas Vapor Detection for Continuous Monitoring in an Underground Monitoring Well

The first and most important fact that should be established is that combustible vapor concentrations and aromatics (smell) are two separate entities. The human nose is capable of detecting odors in the "parts per million" (or greater) range. However, the concentration of smell has no relevance to vapor concentration.

Example: A tea cup of gasoline spilled in the Houston Astro Dome would be hardly noticeable, while the same spill in a three-bedroom home would be extremely alarming, yet neither example would probably create a detectable explosive situation.

In general all vapor detectors are calibrated to some LEL (lower explosive level) standard. Most common methane (or Hexane) is used to calibrate to 1.4% vapor for 100% of LEL of gasoline. THIS SCALE OF MEASUREMENT HAS ABSOLUTELY NO INTERPRETABLE MEASUREMENT OF LAYER OF CONCENTRATION IN THE WELL.

The second factor is that a product such as gasoline, whose vapor pressure is heavier than air (vapor goes to ground level) must be detected as close to the source as possible. The inability of the gas vapor detector to "follow" the change in water depth renders it at best ineffective. If the detector is submerged in product or water, the gas vapor detector is incapacitated and usually must be replaced.

A third factor is the ability of the product to vaporize. Gasoline in a confined environment at 56^{0} generally is not creating tremendous evaporation of product. The vapor pressure is low.

Other considerations are humidity and sufficient oxygen for detection. Oxygen is necessary for most combustible elements to function. At this time, the amount of oxygen available in a monitoring well is not known; however, a minimum of 12% could be doubtful.

Gas Detection Sensor Types

1) Catalytic:

It is highly doubtful that any sintered[1] stainless flash arrestor around the detector elements could survive the continuous attack of humidity in a monitoring well. The clogging of these pores will render this system blind to vapors.

Tetraethyl lead and silicone vapors also coat the catalytic element rendering it "blind" to vapors. Tetraethyl lead is a component of regular gasoline commonly stored at service stations.

2) Solid-State:

Solid-state sensors are commonly constructed out of a water based metal oxide material positioned upon a slightly heated substrait material. This sensor in a normal application can detect parts per million of combustible vapors. The solid-state sensor historically has had problems with sensitivity related with humidity. As the humidity increases, the sensitivity increases. It is anticipated that this system's method of detection in a monitoring well (high humidity) would continually increase sensitivity creating false alarms to the point of total operator mistrust. This illustration is totally concurrent with existing applications in "confined space entry", which is also can be an underground application.

This paper has discussed the application as it is related to gasoline. Fuel oils and "heavier" products have been omitted because their vapor pressures are very low, and detectability in vapor form is highly doubtful.

(1) a pourous metal material

The Pollulert System for Continuously Monitoring in an Underground Well

The Pollulert is new technology and is designed to provide a warning when a significant amount of product appears in a "typical monitoring well" in a liquid phase. This liquid layer thickness of product represents a real problem.

The Pollulert utilizes a detector head assembly which fits on a standard 4 inch well pipe. After the "head" is fitted on the pipe, a detector assembly is lowered into the well. The detector assembly contains a flat with one or more sensors profiled at the liquid interface. The flat and sensors are designed to withstand the constant attack of product, moisture and/or water. It can "track" a change of water level in the well of ± 4 feet. The detector assembly can be ordered with sensors profiled at any depth from 1/4 inch to 2 inches for product detection.

The electrical wiring "runs" from the detector head to a control module which is capable of operating a total of four detection sensors.

The Pollulert System is designed specifically for underground, leak-detection monitoring.

Conclusion

1) Underground leak detection is a new technology in a new market.
2) The only acceptable method of detection is liquid phase detection. It is the only indicator of a real problem.
3) The gas vapor scale of measurement has absolutely no interpretable measurement of leakage or concentration in the well.
4) The only acceptable method of monitoring for leaks and spills in underground applications is Pollulert Systems.

For further information contact:

POLLULERT SYSTEMS
P.O. Box 706
Indianapolis, IN 46206
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Technology for the Storage of Hazardous Liquids, A State-of-the-Art Review, new York State Dept. of Environmental Conservation.

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UPDATE OF NFPA 329 NOW AVAILABLE

"RECOMMENDED PRACTICE FOR HANDLING UNDERGROUND LEAKAGE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS"

On June 9, 1983, the National Fire Protection Association, "NFPA", published major revisions and updates to NFPA 329. The original document was developed in 1964 and the last review was in 1977. With the growing concern for underground tank leak problems, extra effort was put into this 1983 update even to the extent that joint meetings were held with the American Petroleum Institute (API) Leak Task Force to solicit their input. The pamphlet covers everything from emergency safety procedures to be followed in the event of a spill, through testing of underground tanks, investigation and clean up. In addition, it is the most widely adopted language for establishing underground tank testing requirements.

FINAL TEST RENAMED AND DEFINED AS "PRECISION TEST"

Chapter IV of 329 specifically deals with the requirements for accurate testing of tanks for leakage. Obviously, there are many "quick and easy" ways to test; however, according to 329 in order to conclusively determine "tightness", a "Precision Test" must be conducted. In prior versions of 329, this test was referred to as the "Final Test", a term which over the years had become synonomous with the Kent-Moore Test Method (in the development of the original 329 document, API and NFPA had worked together to develop the Final Test Method which evolved as the Kent-Moore Procedure). The renaming of the procedure to the Precision Test eliminates any reference to the Kent-Moore test and allows unbiased acceptance of newer technologies; in addition, the following new definition was developed:

> **"Precision Test as used throughout this pamphlet means any test that takes into consideration the temperature coefficient of expansion of the product being tested as related to any temperature change during the test, and is capable of detecting a loss of 0.05 gallons per hour."**

The **HUNTER LEAK LOKATOR LD2000** underground tank testing technology meets all the requirements for Precision Testing.

leak lokator

Further elaboration on the specific criterion for a Precision Test is included in Chapter IV:

- Be capable of detecting leaks as small as 0.05 gallons per hour, adjusted for accepted variables.
- Test the complete underground storage and handling equipment.
- Temperature correction - new updated coefficient of expansion data is included for gasoline and fuel oil.
- Tank end deflection consideration.
- Water table consideration.

OTHER MAJOR CHANGES

- Pressure Testing with Air or Other Gases

  In addition to the elaboration and specification of the Precision Test as the only acceptable test method to ascertain tank system tightness, 329 further states the following with respect to pressure testing with air or other gases:

  > **"Pressure testing with air or other gases of tanks or piping containing flammable or combustible liquids is not recommended, should not be required by regulations or ordinances, and should be discouraged in practice. Such tests are not likely to detect a leak that is below the liquid level in the tank, and there is severe danger of causing a tank rupture, or expulsion of contained liquid through normal openings."**

  One of the greatest dangers of pressure testing is overpressure due to faulty or inaccurate gauges - tanks are not designed for high pressure. In addition, the test is highly inaccurate because of compression or expansion or the air/vapor due to temperature changes.

- The section on <u>Pipe Line Tests with Air</u> is deleted due to the fact that the test is considered <u>inconclusive</u>.
- The section on <u>Standpipe Testing</u> is deleted due to the fact that the test is considered <u>inconclusive</u>.
- <u>Chapter 5</u>, "Tracing Liquids Underground", and <u>Chapter 6</u>, "<u>Removal</u> and Disposal", include updated material from API 1628-1980 "Underground Spill Cleanup Manual".

For a complete copy of NFPA 329 contact:

National Fire Protection Association
Batterymarch Park
Quincy, Massachusetts 02269
(617) 328-9230

Price is $7.00 per copy.

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416 Airport Terminals
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703 Fire-Retardant Treatments of Bldg Mat'ls
704 Ident of Materials
801 Radioactive Mat'l Facil
802 Nuclear Research Reactors
803 Light Water Nuclear Power Plants
901 Uniform Coding for F P
902M Field Incident Manual
903M Property Survey Manual
904M Investigative Report Manual
907M Investigation of Fires of Elec. Origin
910 Libraries and Library Collections
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1002 Driver Prof Qual
1003 Airport Fire Fighter Prof Qual.
1021 Fire Officer Prof Qual
1031 Fire Inspector Prof Qual.
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1121L Model State Fireworks Law
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1973 Gloves for Structural Fire Fighters
1981 Self-Contained Breathing App
1982 Personal Alert Safety System for Fire Fighters

NFPA

329

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An American National Standard
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UNDERGROUND LEAKAGE OF FLAMMABLE & COMBUSTIBLE LIQUIDS 1983

NFPA®

NATIONAL FIRE PROTECTION ASSOCIATION, INC.
Batterymarch Park, Quincy, MA 02269

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Policy Adopted by NFPA Board of Directors on December 3, 1982

The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids

NFPA 329-1983

1983 Edition of NFPA 329

This edition of NFPA 329, *Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids*, was prepared by the Technical Committee on Tank Leakage and Repair Safeguards (released by the Correlating Committee on Flammable Liquids), and acted on by the National Fire Protection Association, Inc. on May 18, 1983 at its Annual Meeting in Kansas City, Missouri. It was issued by the Standards Council on June 9, 1983 with an effective date of June 29, 1983 and supersedes all previous editions.

The 1983 edition of this standard has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

Origin and Development of NFPA 329

This Recommended Practice is an update of the *Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids*, NFPA 329 — 1977 edition.

This Recommended Practice replaces the 1977, 1972, 1965 and 1964 editions and a manual on this subject issued in 1959. The manual was preceded by a report (NFPA 30B) on the same subject which was withdrawn from publication in 1950.

Committee on Flammable Liquids

Correlating Committee

Technical Committee on Tank Leakage and Repair Safeguards

Contents

Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids

NFPA 329-1983

Chapter 1 Introduction

The purpose of this Recommended Practice is to provide a guide for the safe and efficient handling of flammable and combustible liquids when, for whatever reason, they are found unconfined and unwanted. For the proper installation of underground tanks, see NFPA 30, *Flammable and Combustible Liquids Code*.

1-1 The Problem.

1-1.1 Flammable liquids [those having a flash point below 100°F (37.8°C)] and combustible liquids [those having a flash point at or above 100°F (37.8°C)] are used by the millions of gallons daily and, of necessity, are stored and handled in locations immediately adjacent to structures, facilities, and people. These liquids include chemicals, cleaning fluids, motor gasolines, diesel fuel and heating oils. Motor gasolines are the most widely used of these liquids and they are commonly stored underground at service stations.

1-1.2 In spite of constant effort to maintain and operate storage and transfer equipment properly, accidents do happen, equipment does fail, and people do make mistakes that sometimes permit the escape of these liquids. Leaks may develop from corrosion, or be caused by mechanical damage, or some liquid may be spilled during transfer. Generally, the amount of liquid lost is small and it is dissipated by evaporation or is otherwise assimilated before it creates a serious problem. However, it occasionally happens that some flammable or combustible liquid finds its way into an underground facility, such as a basement, utility conduit, sewer, or well. Whether or not it creates an immediate hazard will depend on many things, such as how much liquid or its vapor is involved, where it is found, how it is confined, possible sources of ignition, etc. But, because a flammable or combustible liquid unconfined in the ground can move from place to place, any indication that such liquids have escaped into the ground must be considered as a potential, if not immediate, hazard.

1-2 Cooperation and Responsibility.

1-2.1 The responsibility for proper handling of a suspected escape of flammable or combustible liquids, or a potential hazard from such an escape, will fall upon various individuals and organizations. The successful handling of these problems will depend upon the best possible cooperation between them.

1-2.2 One of the prime purposes of this guide is to provide a basis for this cooperation. Because of the almost infinite variables involved, it can't be a rule book in the strict sense of the word. It can, however, provide a definite course of cooperative action that will ensure the most effective use of skills and equipment, the fairest assessment of responsibility, and will result in the best possible protection of life and property. A positive, cooperative attitude of anyone potentially involved will benefit everyone, regardless of the final results. Lack of cooperation could result in inadequate protection of life and property.

1-2.3 Since leakage of flammable liquids, especially such liquids having low flash points, is a fire problem, necessary steps to be taken will normally be under the jurisdiction of the fire officials. It therefore becomes important for such officials to understand the many facets of the problem, and to secure the cooperation of interested groups as outlined above.

1-2.4 Recent developments, problems and attitudes have now also involved health and environmental officials. When dealing particularly with water pollution and the more persistent slow or nonevaporating combustible liquids, the concern of these officials may be paramount.

1-2.5 The location of leaks, testing of tanks and piping, removal of leaky tanks and removal of liquid in the earth will require equipment and facilities which may be more available to the industries involved than to the public authorities. In addition, much of the work is not the responsibility of the fire department or other agencies, but rather is the responsibility of the owner of the leakng equipment.

1-2.6 Regardless of the willingness of individuals or companies to cooperate with governmental agencies during an emergency, the agencies should recognize that they should officially request such cooperation.

1-2.7 When tanks are to be removed, or other work done on private equipment, or on private property, such as holes being dug, this work must be authorized by the owner. Such authorization generally is easy to secure if the work has been requested by officials. In some cases, these requests may of necessity be in the form of a written order. Regardless of conditions leadership and a close spirit of cooperation should be established by the responsible agency.

1-2.8 In addition, those in industry having special qualifications in dealing with leakage should be called upon for help and guidance. Their knowledge and experience should merit careful consideration.

1-2.9 This guide is intended for the information of all organizations and persons involved.

Chapter 2 Procedure When Life or Property May Be in Danger

2-1 General. The need for cooperative effort by many individuals and organizations is stressed in the introduction preceding this chapter. Good judgment must be used in assembling the various groups. Always seek assistance in the interests of safety, but avoid creating unnecessary alarm or unwarranted interruption of normal activities. Owners, operators or others becoming aware of a hazardous condition should notify the fire department, police, or other proper authority. However, make every reasonable effort to determine the degree of the problem. Excessive alarming, such as may be caused by unwarranted evacuation or publicity, can create more hazard than the original problem. Good judgment applied to the following step-by-step guide will materially improve the chances for successful results

2-2 Conditions. The potential that unconfined flammable or combustible liquids exist underground will normally become known by discovery of one of the following conditions.

2-2.1 Combustible or flammable liquids or their vapors are reported in:

(a) Normally inhabited subsurface structures such as basements, subways, and tunnels;

(b) Other subsurface structures such as sewers, utility conduits and observation wells near tanks;

(c) Groundwater such as drawn from wells, on or in surface water, or emerging from cuts or slopes in the earth.

2-2.2 User reports loss of stock or presence of water in the storage facility. *Each condition requires different handling:*

2-3 Condition 2-2.1(a) — Normally Inhabited Subsurface Structures such as Basements, Subways, and Tunnels.

2-3.1 General. This condition implies a strong potential hazard to life or property and immediate steps must be taken to protect the public from the danger of explosion and fire.

2-3.2 Eliminating Sources of Ignition.

2-3.2.1 Smoking or other sources of ignition should not be permitted in the suspected area. Lights and other electrical switches should not be turned on or off and extension cords should not be removed from outlets. Such action may create a spark capable of igniting flammable vapors. Use only those switches located well away from the contaminated area to cut off electrical power, which may require the electric utility to make a remote cutoff.

2-3.2.2 After the presence of flammable vapors has been verified, the electric and gas services to the building, where possible and feasible, should be disconnected or cut off outside the structure. The shutting off of the gas service outside of the building removes the fuel from pilot lights and gas burners, which may be sources of ignition.

2-3.2.3 No one should enter the contaminated area except as described in "Entering the Area." Where liquids or vapor within or above their flammable range are found in a building, the building should not be entered, and evacuation of building occupants, at least in areas exposed, should be ordered. Construction and layout as well as occupancy are factors to be considered in ordering evacuation. Traffic should be stopped through tunnels and subways until qualified personnel determine there is no danger of explosion or fire.

2-3.3 Entering the Area.

2-3.3.1 The presence of flammable vapors in a building is generally reported because of an odor. Most persons can detect gasoline vapor in concentrations as low as .005 percent. However, smell cannot be relied upon to determine the type of vapor or its concentration. The use of a combustible gas indicator is the only practical, positive method to determine the presence and extent of a flammable vapor concentration.

2-3.3.2 To enter an area in which there is an undetermined concentration of some unknown vapor is to risk the possibility of fire or explosion. Entry should not be made until the vapor concentration has been checked with a combustible gas indicator. Portable combustible gas indicators are reasonable in price and are recommended for use by all fire departments. If the fire department does not have such an indicator, arrangements should be made for securing one or more from utilities, oil companies or others who may have them available. A trained operator should use the combustible gas indicator, which must be well maintained.

2-3.3.3 Also an additional life hazard may exist because of toxic vapors or insufficient oxygen. If these conditions are suspected, instruments to detect toxic vapors or insufficient oxygen should be used.

2-3.3.4 Use the combustible gas indicator continuously to determine the range of vapor concentrations in the affected area. If areas of vapor concentration above 50 percent of the lower flammable limits (LEL on indicators) are exposed to a source of ignition, leave the area and evacuate everyone within the danger zone. Ventilate the area to remove or reduce the flammable vapors and thus reduce the fire or explosion hazard. As soon as the flammable vapor has been reduced below 50 percent of the lower flammable limit, entry may be made to locate and eliminate the source of vapor. Wear self-contained breathing apparatus when entering.

2-3.4 Ventilating the Area.

2-3.4.1 Natural ventilation by opening doors and windows may be adequate. Grounded mechanical exhaust ventilating equipment may be required to remove vapors from all areas, particularly from low, confined spaces. Use fans driven by motors approved for Class I, Group D locations, hand-driven fans, or air eductors to remove vapors. (*See Figure 1.*) Eliminate sources of ignition near the exhaust outlets. Provide openings for free entry of fresh air, but never force air into the area. A water hose with the nozzle set in a spray pattern may be used for ventilating the area when set in a window and discharging outwardly.

2-3.5 Locating Seepage into Building.

2-3.5.1 When the area has been made safe for entry, it may be examined to determine the source of the flammable vapors. If the place or places of entry of the liquid or vapors can be determined, appropriate steps should be taken to seal off such places. Untrapped drains, dry traps, pipes or other openings through floors or foundations are common sources of liquid or vapor entry into a building. Check any gas pipes in the area; the flammable vapor may be fuel gas. If this appears to be the source, call the gas company.

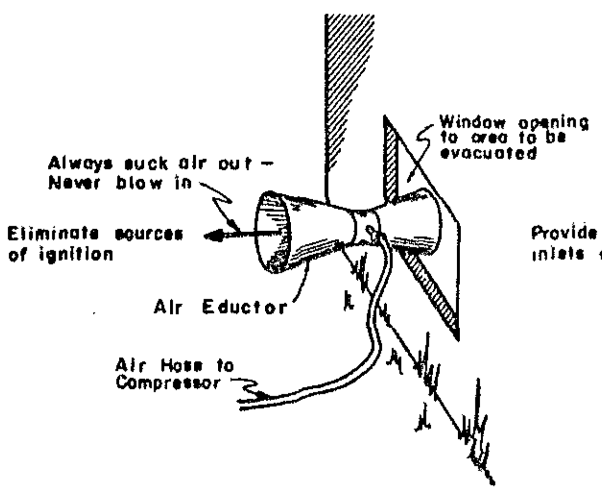


Figure 1 Exhaust Venting

2-3.6 Preventing Seepage into Buildings.

2-3.6.1 Entrance of vapors or liquids through drains, pipes, or other openings may be stopped by plugging such openings. Sewer pipes may be the source of entry. If only vapor is entering through a sewer pipe, it may be because the trap is dry. Filling the trap with water is an effective means of blocking further gas or vapor entry.

2-3.6.2 The nature of seepage may be such that it cannot be effectively stopped from the inside of the structure. In this case an intercepting hole or trench, holes for pumps, or well points may be used outside the contaminated structure, between it and the suspected source. (*See Chapter 6 for details.*)

2-4 Condition 2-2.1(b) — Other Subsurface Structures such as Sewers, Utility Conduits, and Observation Wells near Tanks.

2-4.1 Liquids or vapors in such structures imply a potential for explosion or fire but, generally, a low potential of hazard to life and property other than to the structure involved. If the detection of flammable or combustible liquids or their vapors indicates an unusual condition wherein vapors are escaping from the sewer or conduit into an area similar to Condition 2-2.1(a), or if the proximity to other structures or facilities is such that an explosion or fire would be relatively as serious as Condition 2-2.1(a), then proceed with the guides of 2-2.1(a) in addition to the following procedures.

2-4.1.1 Contact those directly responsible for the facility involved: the municipal sanitary department or highway or street department for sewers; for conduit, the electrical, telephone and gas companies' engineering departments. Normally, the maintenance and engineering departments of such organizations will be well equipped to take charge of the situation; police, if needed, may be asked to keep the public clear of the danger areas. The fire department may be needed to assist in fire control and purging. Those involved with the storage and handling facilities of flammable and combustible liquids that may be the source of the problem shoulld offer all possible assistance. (*See NFPA 328, Flammable Liquids and Gases in Manholes and Sewers, and Chapter 5 of this guide for further details.*)

2-4.2 Entering the Area.

2-4.2.1 Basically the same as for Condition 2-2.1(a); however, the flammable vapors in a sewer or conduit may not originate from flammable liquids. They may be vapors from overheated insulation, sewer-generated gases, fuel gases, or industrial gases. Consequently, special instruments, equipment and skills may be needed. The guidance of the utility owning and operating the facility should be solicited and followed.

2-4.3 Ventilating the Area.

2-4.3.1 Some type of grounded mechanical ventilating will normally be required. Use explosionproof equipment if the vapors are drawn out. Remove all sources of ignition from the vicinity of vapor exit.

2-4.3.2 It may be that water flushing is the better means of purging the area of flammable vapors. For example, the generation of sewer gas may be stopped or significantly reduced by this method. In a similar fashion, flammable and combustible liquids may be removed from the area.

2-4.3.3 In any case, follow the guidance of the owner or operator of the facility as he will be most familiar with its characteristics and the consequences of any action taken.

2-4.4 Locating the Seepage.

2-4.4.1 Assist the facility owner in any way practicable. See Chapter 5 for information on tracing liquids underground.

2-4.5 Preventing Continued Seepage.

2-4.5.1 When leakage is detected in a sewer, location of the source of the leak should be determined by backtracking with combustible gas indicators. If points of entry to the sewer system are limited in number, interception of the leak can be achieved by use of trenches, well holes, or well points. (*See API 1628-1980, Underground Spill Cleanup Manual, for additional information.*)

2-4.5.2 If entry of liquid or vapor into the conduit or sewer is to be stopped, and the inside of the facility is not accessible, probe or drill alongside the facility to determine the extent of its exposure to the saturated soil. Uncover the exposed area and caulk the facility from the outside.

2-5 Condition 2-2.1(c) — Groundwater such as Drawn from Wells, on or in Surface Water, or Emerging from Cuts or Slopes in the Earth.

2-5.1 General. These liquid seepages on water will often be more of a problem because of pollution than as an explosion or fire hazard. However, until the source of the flammable or combustible liquid is found and stopped and all liquid and vapor safely removed, there is a potential hazard of explosion or fire.

2-5.2 Wells.

2-5.2.1 When flammable or combustible liquids are found in well water, stop pumping and avoid any source of ignition around well houses and water storage tanks until vapor concentrations are checked. Turn power off outside any well house or similar trap that may collect vapors from the well or stored water.

2-5.2.2 If vapor concentrations are below 50 percent of the lower explosive limit, pumping may be resumed if desirable for purging. (*See Chapter 6 for details.*)

2-5.3 Surface Water.

2-5.3.1 When flammable or combustible liquids are found on surface water or water emerging from hillsides or cuts, concentrations may develop in ditches or collection points that may create an explosion or fire hazard. Normally, the amount of flammable or combustible liquid found on the surface water will be in such a thin layer that it does not create a fire hazard. This is the case when the liquid is dispersed into small bubbles or pools, or when only color patterns are visible on the surface of the water.

2-5.3.2 However, if the entire surface of the water is covered, or there are large pools in the order of 20 ft (6 m) or more across, a fire hazard does exist. If this occurs in an inhabited area or along a street or highway, and the police and fire department are not present, they should be called. Traffic should be stopped and the public kept away from the area. If large amounts of vapor are being generated, check the wind and remove all sources of ignition within at least 100 ft (30 m) downwind of the source. It is unlikely that vapors will be in the flammable range farther than 100 ft (30 m) away. However, if large amounts are involved, and the air is relatively still, a combustible gas indicator should be used to determine the extent of the hazardous area. Its use is desirable in any event if flammable liquids are involved.

2-5.3.3 Normally, the only effective means to stop further accumulation will be to find the source and stop it. (*See Chapters 5 and 6.*) It may be desirable to construct dikes or dams to prevent further spreading of the liquids or of contaminated water.

2-5.3.4 Floating booms can be used on flowing water to hold the contaminating liquid. (*See Chapter 6 for details.*)

2-5.3.5 Once the source of flammable or combustible liquids is stopped, evaporation or normal dispersal and dilution will often be the best means of removal. Collection with adsorbents or skimming devices or filtering devices may be necessary. (*See Chapter 6 for details.*)

2-6 Condition 2-2.2 — User Reports Loss of Product or Presence of Water in Storage Facility.

2-6.1 An inventory loss, or water in tanks, does not directly imply a hazard of fire and explosion. Check the immediate vicinity for any signs of escaping liquid; if any exist, apply Conditions 2-2.1(a), 2-2.1(b), or 2-2.1(c), as appropriate. Otherwise, proceed in accordance with Chapter 4, Testing for Underground Leaks.

Chapter 3 Primary Search for the Source

3-1 General.

3-1.1 Once all necessary precautions have been taken to protect life and property, the next most important step is to determine the source of the flammable or combustible liquid and prevent any further escape.

3-1.2 Generally, the source of a flammable or combustible liquid will be relatively near the location of the discovery of unconfined liquids or vapors. However, liquids can travel blocks or even miles underground through porous soil or rock, trenches filled with porous soil, alongside pipes or conduits, or in sewer pipes. Consequently, the area from which an escaped liquid could have come may be remote and extensive, and include many facilities storing and handling flammable or combustible liquids. If a check of potential sources (*see 3-2.2.1 for check list*) immediately adjacent to, or within a few hundred feet of, the discovery does not reveal an obvious or possible source, organize a general search of the area.

3-1.3 Efforts should be made to secure information on ground water flow from the local United States Geological Survey (USGS) office, public works departments, or equivalent agency and primary search efforts should be initiated upgradient of the leak.

3-1.4 Obtain (or sketch) a map of the area, mark each facility found on the map, and record all the information obtained in a notebook. Good data, well organized, will prove invaluable in subsequent efforts to solve the problem.

3-1.5 Organize teams of as many qualified persons as are needed and available to conduct the search. A very efficient method is to assign two-person teams (with one person representing the local public authority) to specific areas on the map. Begin with the nearest and most obvious potential sources and work out from the point of discovery, concentrating on moving uphill, upstream of underground water flow, or upstream of sewer or conduit flow.

3-1.6 Quite often the source can be found by inquiry or simple inspection. Begin with the "Primary Search." If this fails to discover an obvious or very likely source within the first few hours, it is advisable, while the Primary Search continues, to begin testing equipment for concealed leaks at the closest and most probable sources (*see Chapter 4*) and to take the first steps in tracing underground liquids (*see Chapter 5*).

3-2 Primary Search Procedure.

3-2.1 Flammable or combustible liquids will escape into the ground from one of two principal sources: (a) liquid has been spilled during transfer and has run into a sewer or soaked into porous soil; or (b) a leak has developed in storage, transporting or handling equipment.

Use the list below to check for spills or other possible sources by asking questions and by a careful inspection of premises and equipment. Unless an obvious source is found, substantial enough to account for the seepage, do not stop the search at the first sign of a potential source. First impressions can be misleading.

3-2.2 Liquids may travel slowly underground or may not move at all until the water table rises. As a result, there can be a considerable time lapse between the occurrence of a leak or spill and the report of finding liquid or vapor. Record all history or evidence of potential sources regardless of how long ago they occurred; do not eliminate any potential sources on the basis of time, until data is available and the analysis of that data justifies elimination.

3-2.2.1 Possible sources to check:

(a) Gasoline service stations.

(b) Automotive garages or agencies.

(c) Fleet operators such as taxicab companies, dairies, bakeries, municipal garages, etc.

(d) Contractors or equipment dealers who may store fuels on their premises.

(e) Fuel distributors that supply service stations or commercial users.

(f) Heating oil distributors.

(g) Cleaning establishments.

(h) Chemical companies.

(i) Industrial plants that may use and store flammable or combustible liquids.

(j) Airports and marinas.

(k) Check public records, make inquiries about any high-pressure petroleum or gas lines in the area. They may be marked with signs at street and railroad crossings.

(l) Any abandoned flammable or combustible liquid tanks.

(m) Any other properties on which flammable or combustible liquids may be stored.

3-2.2.2 Questions to ask:

(a) Has there been a spill during loading or unloading?

(b) Any storage or handling equipment leaking, or has there been a leak? Check for excavations that may have damaged underground facilities or give evidence of repairs.

(c) Has any maintenance work involved release of liquids from tanks, pipes, or equipment?

(d) Has there been any odor or sign of liquids where they should not be?

(e) Are inventory and use records kept?

(f) Has water been found in the storage facility?

(g) Is there any knowledge of an accident in the area that may have released liquid from tank trucks, barrels, or large fuel tanks? (A check with local police may be in order.)

(h) Ask about the age of underground facilities. If subsequent equipment checks are made, the older equipment is suspect as a leaking source because of corrosion.

(i) Have any pumping problems been experienced?

If inquiry fails to disclose any potential source, ask the owner or operator for his cooperation in checking the equipment and the area around the premises. If he refuses because he does not own the equipment, contact the owner for his cooperation. If necessary, governmental authority such as exercised by fire officials, may be used to obtain such cooperation.

3-2.2.3 Checking equipment:

(a) Check the area around fill pipes where liquid is transferred from truck to tank for signs of frequent spills. Saturated and darkened soil, stained concrete, or disintegrated asphalt indicates repeated spills that may accumulate underground.

(b) Check the area around aboveground tanks for similar signs that may indicate a leak or overfilling.

(c) Check any exposed piping for signs of leaks.

(d) Check pumping equipment for leaks. It is advisable to use a combustible gas indicator when checking pumps/dispensers of the type used in service stations. Open the cover of the unit just far enough to insert the indicator probe into the bottom area. Opening the cover wide may provide sufficient ventilation to give such a low reading as to indicate no leak. Also, check the hose and nozzle.

(e) If a remote pumping unit is used, check its housing or pit with a gas indicator before opening and then open for visual check for signs of leaks.

(f) Check automotive repair areas for signs of waste liquids being dumped into floor drains or sumps.

3-2.2.4 Checking the area:

3-2.2.4.1 If all equipment seems to be in order and there is no obvious sign of spilling or dumping into sumps or sewers, check around the grounds and adjoining areas.

(a) Look for signs of dumping waste liquids on the ground.

(b) Check nearby streams and bodies of water for signs of flammable or combustible liquids.

(c) Check vegetation in the area for any indication of damage by spillage, dumping or contaminated ground water.

(d) Using a combustible gas indicator, check sewers and other underground cavities such as telephone and utility conduit manholes for presence of vapors and make visual inspection for signs of foreign liquids on water surfaces.

(e) Check nearby excavations and steep cuts or natural slopes below the potential source for signs of liquid coming through the soil.

3-2.2.4.2 When leaks in equipment are discovered, ask the user and owner to stop use of the equipment until the leak is repaired. Pump out liquid in storage if it is still escaping through the leak.

3-2.2.4.3 If large spills have been reported or there are indications that there has been repeated dumping or spilling of flammable or combustible liquids into sewers or on the ground, ask those involved to modify their operations to prevent recurrence.

3-2.2.4.4 Be reasonable and fair; recognize that small spills may inadvertently occur and that a very small amount of petroleum liquid (just one cup of gasoline, for example) on a wet pavement will spread over a large area, appearing to be a more severe spill than it actually is. Spills on the surface that spread out will dissipate rapidly and are not likely sources of underground contamination. The significant spills are large spills that can flow to points of access to underground structures or areas of porous soil, or repeated smaller spills that immediately flow into structures or soak into soils and reach the water table.

3-2.2.4.5 If an obvious source, or one or more likely sources, has been found and further escape of liquids eliminated, further search may be temporarily suspended to determine if, in fact, the located

source(s) is the cause of the problem. While removal and protective measures are taken, monitor and record the flow of liquid, the amount of liquid, and the vapor concentration at those locations where the problem exists. If there is a distinct and continuous decrease it may be assumed that the source(s) has been found and further contamination eliminated. The decrease may not show up immediately; it may, in fact, require days or weeks to remove liquid that has accumulated underground or for it to dissipate. Refer to Chapter 5, Tracing Liquids Underground, to determine how much time may be required before a decrease at the monitoring point may be expected.

3-2.2.4.6 If, after a reasonable length of time as determined with the reference above, the supply of liquid to the threatened area does not stop or show definite decrease, further investigation should be conducted simultaneously along two paths. These two paths also should be followed if no source is found.

3-2.2.4.7 One is a test of flammable or combustible liquid storage and handling equipment in the vicinity of the contaminated area; the other is to trace the liquid underground from its point of discovery. Tracing is conducted to determine the extent of the contamination, the direction of flow, and any potential more remote source(s). Tests on underground equipment are performed to determine definitely whether or not they are a source. *(See Chapter 4, Testing for Undergound Leaks, and Chapter 5, Tracing Liquids Underground.)*

Chapter 4 Testing for Underground Leaks

4-1 General.

4-1.1 Tests to determine the tightness of underground liquid handling equipment will have to be conducted when:

1. The search procedures of Chapter 3 or the tracing procedures of Chapter 5 indicate a probable or likely leakage source, but the actual cause is not determined from surface observation;
2. There is a suspicion of a leak because of reported stock losses;
3. There is a report of the accumulation of water in a tank.

4-1.2 Review all data previously gathered to determine the most efficient method or methods of testing. There are several quick and simple tests described in this chapter that may reveal a leak under certain circumstances. If one of these preliminary tests does not reveal the source of a suspected leak, it cannot be concluded that the liquid-handling system is tight, but the possibility of quickly solving the problem will often warrant the limited effort involved before a precise Precision Test is undertaken. (*See 4-3.10.*)

4-1.3 One or more of these preliminary tests would be particularly desirable if precise final test equipment is not immediately available. If such equipment is available, time and labor costs may be reduced by immediately making a Precision Test.

4-1.4 Regardless of the testing procedure involved, keep in mind that liquid-handling equipment should be tested in a condition as close as possible to normal operating condition, particularly equipment which is underground or otherwise concealed. There are several important reasons for this.

4-1.4.1 Uncovering and exposing can very easily cause a leak which did not previously exist and its discovery might imply the problem is solved when, in fact, it is not.

4-1.4.2 Responsibility resulting from unconfined liquids or vapors underground might be falsely placed by a leak created by uncovering and removal activity.

4-1.4.3 Uncovering underground liquid-handling equipment is costly and time consuming and is not justified without valid reasons to suspect leakage.

4-1.4.4 Excessive pressures or tests by nonrepresentative liquids may indicate leaks where none existed or conceal leaks where one, in fact, exists.

4-2 Action Preliminary to Testing.

4-2.1 Before actual equipment testing is undertaken, review the results of the Primary Search in Chapter 3. This review may reveal information that will eliminate the need for further testing or this information will be useful in making further tests.

4-2.2 Ensure that spills or deliberate disposal are not the leakage source, keeping in mind the possible transit of liquids by trenches and underground water. (*See Chapter 5.*)

4-2.3 Recheck stock records for indications of loss; but do *not* jump to conclusions. Meters may be off calibration causing only a paper loss, not a physical loss.

4-2.4 Temperature change may falsely indicate a loss. The volume of petroleum products is highly sensitive to temperature change. A drop of one degree Fahrenheit will shrink 1000 gal (3785 L) of gasoline by 0.6 gal (2.2 L). This may at first seem small but consider a typical example. In the spring, the ground will still be relatively cool from the preceding cold weather, while liquids stored and transported aboveground may be relatively warm.

4-2.5 A typical underground storage tank may handle 20,000 gal (75-700-L) in one month. If, on the average, this liquid cooled 5°F (2.8°C) after delivery, stock records will show a loss of 5 × .6 × 20 = 60 gal (227 L). Ten degrees cooling would appear as a 120 gal (454 L) loss for 20,000 gal (75 700 L) handled, and 240 gal (908 L) loss for 40,000 gal (151 400 L) handled. Obviously, a temperature increase would have the opposite effect and could actually conceal a physical loss.

4-2.6 Finally, theft may be the cause of reported stock loss.

4-2.7 Consequently, further checking must be performed before a facility is implicated on book stock losses alone. Check meters for calibration. Check relative temperature of delivered and stored product during the period in question. Check for the possibility of theft.

4-3 Checking Inventory Records.

4-3.1 A careful check of inventory records will be very helpful in determining the course of further investigation.

4-3.1.1 If the reason for the check is a report of loss of inventory but no liquid or vapor has been reported in unexpected locations:

(a) Loss due to meters out of correct calibration, loss by contraction due to lower temperatures, or theft would indicate that a hazard need not be expected. Further testing is not necessary;

(b) If not solved as in (a), evidence of an inventory loss requires further testing to determine the cause. It also indicates that a potential hazard may develop from the escaped liquids and a check of the surrounding area should be made for signs of contamination. (*See 3-2.2.4 — 3-2.2.4.7.*)

4-3.1.2 If the reason for the check is discovery of escaped liquids or vapors found underground:

(a) Evidence of inventory loss strongly implies the source has been found but subsequent checks to determine how the loss has occurred must be made before definite conclusions can be drawn;

(b) Loss partially or totally explained by off-calibration meters, temperature shrinkage or theft cannot be considered as conclusive evidence that the site in question is not a source. Records are often incorrect or inadequate; unless another source is found and considered to be a satisfactory solution to the problem, other tests must be performed to draw definite conclusions.

4-3.1.3 When a review of the Primary Search Procedure (*see Section 3-2*) fails to reveal a probable source, any leak that may exist is probably underground, and testing of the liquid-handling equipment is required.

4-3.1.4 Many methods have been devised to test for leakage. Recent extensive studies and experience have clarified their effectiveness and limitations.

4-3.2 Pressure Testing with Air or Other Gases.

4-3.2.1 Pressure testing, with air or other gases, of tanks or piping containing flammable or combustible liquids is not recommended, should not be required by regulations or ordinances, and should be discouraged in practice. Such tests are not likely to detect a leak that is below the liquid level in the tank, and there is severe danger of causing a tank rupture, or expulsion of contained liquid through normal openings.

NOTE: There are systems that use unique gases that are not dependent on pressure for detection of leaks.

4-3.3 Testing Underground Facilities.

4-3.3.1 Using the information gained from the Primary Search Procedure (*see Section 3-2*), use the following tests in a logical process of elimination. For example, if water is reported as entering a tank, or if the tanks are old and corrosion is known to exist in the area, make the preliminary checks on the tanks first. On the other hand, if pumping troubles are reported, the piping is suspected and preliminary tests should be performed on underground piping first.

4-3.3.2 The tests described on the following pages are listed in approximate order of ease of performance, the easiest being first. The sequence should be varied to fit the circumstances, as noted in the preceding paragraph.

4-3.4 Checking Underground Pipe.

4-3.4.1 Check for:

(a) Recent digging, driveway repair, or other work in the area which may have damaged underground lines.

(b) Any recent repairs that may have been made indicating a previous leak or perhaps creating a leak due to faulty work.

(c) Any evidence of shifting ground, such as frost heave, which may have damaged lines.

(d) Soft spots in asphalt paving indicating solvent action of liquids or vapor.

4-3.4.2 If information on the location of liquid underground has been compiled by methods described in Chapter 5, Tracing Liquids Underground, review this information for possible patterns that may indicate a specific pipe is likely to be the source. It may be advisable to drive or drill additional holes to define more definitely where the liquids are and how they are flowing. (Review in particular the information in connection with Figure 11 in Chapter 5.)

4-3.4.3 The test to be used on piping will depend on the method used to move or pump the stored liquid.

4-3.5 Suction Line Testing.

4-3.5.1 If the pump used in moving the liquid is above ground the supply pipe operates under vacuum or suction and certain pumping characteristics indicate either a leaking check valve or a leaking pipe. If there is a leak, air will enter the pipe as liquid drains back into the tank through the check valve or through a pipe leak into the ground. The presence of air will be indicated by the action of the pump in the first few seconds of operation after an idle period. If the pump is equipped with a meter and cost/quantity display device such as is found in a gasoline service station, pumping of air is indicated by the display wheels skipping or jumping. Other indications of air in the suction line are:

(a) The pump is running but not pumping liquid.

(b) The pump seems to overspeed when first turned on and then slow down as it begins to pump liquid.

(c) A rattling sound in the pump and erratic liquid flow indicates air and liquid are mixed.

4-3.5.2 If any of the preceding conditions indicate a leak in the suction line, the check valve should be inspected first. Some check valves are located close to the pump inlet, others are mounted in the underground pipe just above the tank, and some may be on the end of the suction stub inside the tank. Some of those valves located in the pipe above the tank can be inspected and repaired from the surface of the ground through a special extractor mechanism installed with the valve. If not, or if the valve is inside the tank, it may be necessary to dig down to the tank to check the valve or disconnect and seal off the pipe for a hydrostatic pressure test. (*See 4-3.6.*)

4-3.5.3 Generally, digging down to the check valve or tank should be delayed until other more easily performed surface tests have failed to reveal the leak. If there is any doubt that the check valve seats tightly, repair it, replace it or seal it off. Then repeat the pumping test and, if air is still entering the suction line, it may be assumed the pipe is leaking underground and it should be exposed for inspection. Dig carefully to avoid damage to the pipe which might make it impossible to verify whether a leak actually existed prior to uncovering.

4-3.5.4 If the pumps do not exhibit the symptoms of a leak as described above but there is still reason to suspect a pipe leak; or, if a complete system check has been performed and it is now necessary to isolate and check the piping system, individual pipe runs may be isolated and hydrostatic pressure tested.

4-3.6 Hydrostatic Test of Piping.

4-3.6.1 Isolate the piping and conduct a hydrostatic pressure test at 50 psi (2600 mm Hg) or greater. If the pressure drops more than 5 psi (260 mm Hg) per minute, it indicates the probability of a leak in the line. Repeat the test at least once to ensure against compression of entrained air. Any pressure drop less than 5 psi (260 mm Hg) per minute is inconclusive as it may be caused by cooling. If the test continues to indicate a leak, appropriate action must be taken.

4-3.7 Discharge Pipe Line Testing (pipe under pressure from remote pump).

4-3.7.1 Quite often pumps are located in the tank, or, on some rare occasions, just above the tank but remote from the dispensing devices. In such cases, the pipe to the dispensing equipment operates under pressure. A leak in this line will cause rapid loss of pressure after the pump is turned off. This can be checked in the following manner.

4-3.7.2 At the dispenser end of the pipe, close the emergency shutoff valve at the base of the dispensers or close any valve upstream of any hose to hold pressure at the dispenser end. The pump end can be sealed off by setting the check and relief valves in the head of the pump. The check valve is readily accessible in the manhole over the pump, and most are equipped with a screw or bolt supplied for the specific purpose of positively seating these valves for line checking. Install a pressure gage in the line [a minimum 3 in. (76 mm) dial with maximum 60 psi (3100 mm Hg) range should be used to clearly show graduations of 1 psi (51.72 mm Hg)]. Generally, the best location for the gage is in the emergency shutoff valve under the dispenser where ¼ in. or other small size plugs are installed for this purpose. Start the pump, note the maximum pressure [generally 25 to 35 psi (1290-1760 mm Hg)], seat the check valve, turn off the pump and observe any pressure drop. If the pressure drops more than 5 psi (260 mm Hg) per minute, it indicates the probability of a leak in the line. Repeat the test at least once to ensure against compression of entrained air. Any pressure drop less than 5 psi (260 mm Hg) per minute is inconclusive as it may be caused by cooling or a small valve leak. If the test continues to indicate a leak, appropriate action must be taken.

4-3.7.3 If the preceding tests do not reveal a leak, they should not be considered as conclusive and undergound piping must be included in the Precision Test described in 4-3.10.

4-3.8 Checking Underground Tanks.

4-3.8.1 Review the information obtained from the Primary Search described in Chapter 3. Ask about, observe, and note in particular:

(a) Method of filling tanks - damaged fill pipes, poorly maintained tight-fill connections or hose couplings, driver carelessness, or even overemphasis on full deliveries may cause some of the product to be spilled around the pipe when a delivery is made. Particularly, check fill pipes installed under manhole covers. On night deliveries in which the tank is filled into the fill pipe a warmer underground product temperature can cause considerable overflow due to expansion before dispensing begins the following day;

(b) Any evidence of ground settlement around tanks and any sign of work that may have damaged the tank or its fittings;

(c) History of past or recent work on the tanks or attached piping;

(d) The presence of excessive amounts of water in the tank and any history of past water removal. (Use water-finding paste on the gage stick.) Ascertain, if possible, if the water increases during periods of heavy rainfall and remains constant or diminishes during dry spells. Also, if possible, ascertain the depth of the water table, i.e., the static level of the ground water, by using an easily drilled, probed or excavated area close to the tank(s) or some existing undrained opening;

(e) The age of the tank; in particular, as it relates to the history of corrosion in the vicinity;

(f) The location and flow of liquid found underground by gas sensors or visual inspection. It may be advantageous to drive or drill additional holes to develop more detailed information.

4-3.8.2 Use this information to guide subsequent inspection and testing.

4-3.9 When Water is Reported to be Entering a Tank.

4-3.9.1 Check the fill pipe to ensure that water is not entering through a loose fill cap.

4-3.9.2 Check the surface area around vent lines for evidence that water may be entering by this route. Standing water over vent lines may be the source. Note this possibility for future use.

4-3.9.3 If no explanation, except a possible leak, is found for water in the tank, carefully record the depth of water by water-finding paste, and tightly close and lock the fill cap. After 8 to 12 hours, remove the cap and again check for water. If the rise in 12 hours exceeds ½ in., close and lock the cap and check for another 8 to 12 hours. If the rise in the second period closely matches that of the first period, a leak is probable. A rise of less than ¼ in. in 8 hours is inconclusive due to the inability to measure the water level closer than to within ¼ in. Longer test periods will have to be used to determine definitely if a leak does, in fact, exist. Best results will be obtained if the water depth is less than 3 in. (75 mm) at the beginning of the test.

4-3.9.4 The above tests are not conclusive if the water table is above the top of the tank, as water could be entering around pipe connections into the tank top or through unused plugged or capped openings in the top of the tank which are not watertight. Also, if water is entering the tank at these top openings it is not significant from the standpoint of tank leakage. Likewise, these tests are not conclusive if the tank is full, or substantially full, of product.

4-3.9.5 In fact, water may not enter the tank if the level of product is at or above the level of the water table outside the tank. These tests are relatively effective if the tank is practically empty and the water table is high but still below the tank top. A tank partially below the water table can have water enter, or lose product, through the same leak depending on the relative levels of the ground water and the product in the tank.

4-3.9.6 If a leak is indicated by the above test, take appropriate action.

4-3.10 Precision Test.

4-3.10.1 Precision Test, as used throughout this pamphlet, means any test that takes into consideration the temperature coefficient of expansion of the product being tested as related to any temperature change during the test, and is capable of detecting a loss of 0.05 gal (190 ml) per hour.

4-3.10.2 A test should be used which is chosen from currently available technology to reasonably determine whether or not an underground liquid storage and handling system is leaking. Any testing device used for the Precision Test must be capable of detecting leaks as small as 0.05 gal (190 ml) in one hour, adjusted for variables, a limiting criterion widely accepted by most authorities.

4-3.10.3 The test procedure should measure the amount of liquid lost based upon fundamentally sound principles. It should detect a leak anywhere in the complete underground storage and handling equipment. If the net change exceeds 0.05 gal (190 ml) per hour or equivalent criterion established for the technology employed, a leak is likely to exist, and appropriate corrective action is necessary.

4-3.10.4 The Precision Test should account for all the variables which will affect the determination of the leak rate. An understanding of what these variables are and how they are handled is essential to effective performance of the test. Following is a discussion of some of those variables and how they affect the measurement.

4-3.11 The Effect of Temperature.

4-3.11.1 Liquids expand with an increase in temperature and contract with a decrease in temperature. Figure 2 lists the thermal coefficient of expansion for some of the more common flammable and combustible liquids.

Thermal Expansion of Liquids	Volumetric Coefficient of Expansion per Degree
Acetone	0.00085
Amyl acetate	0 00068
Benzol (benzene)	0 00071
Carbon disulfide	0 00070
Ethyl ether	0 00098
Ethyl acetate	0 00079
Ethyl alcohol	0 00062
*Fuel Oil #1 - Kerosene	0 0005
*Fuel Oil #2 - Diesel	0 00045
*Gasoline	0 0007
Methyl alcohol	0 00072
Toluol (toluene)	0 00063
Water - at 68°F	0.000115

Figure 2

*These are typical coefficients of expansion but may vary depending on components of the mixture and on the temperature. See ASTM D 1250 80 Petroleum Measurement Tables, for further information.

4-3.11.2 Note that a temperature decrease of only .02°F (.056°C) in one hour in a 6,000 gal (22 710 L) tank containing gasoline would cause a volumetric decrease of .02° (.056°C) × .0007 × 6,000 gal (22 710 L) = .084 gal (318 ml) which exceeds the .05 gal (190 ml) considered to indicate a leak. If this temperature change was not detected and accounted for in a test, a leak would be assumed where none existed. And in a like manner, if the temperature increased, a leak could be concealed by volumetric expansion if the temperature change was not detected.

4-3.11.3 It is sometimes proposed that this problem can be overcome by filling the tank 10 or 12 hours before a test run; on the assumption that the product temperature will stabilize. Extensive tests have shown that this is seldom if ever true. When liquid is added to fill a tank for testing, it will often require several days for the liquid to stabilize to ground temperature, which in itself is constantly changing. The rate of temperature change in the first day or two will generally be in the range of .02°F (0.56°C) per hour to .25°F (0.7°C) per hour. Obviously, the test must be capable of detecting any very small temperature changes if it is to be conducted in a reasonable length of time.

4-3.11.4 Another temperature effect that must be recognized and accounted for is temperature stratification or temperature "layering." Figure 3 illustrates how temperature may vary in a typical underground tank after cool product has been added to warmer product already in the tank.

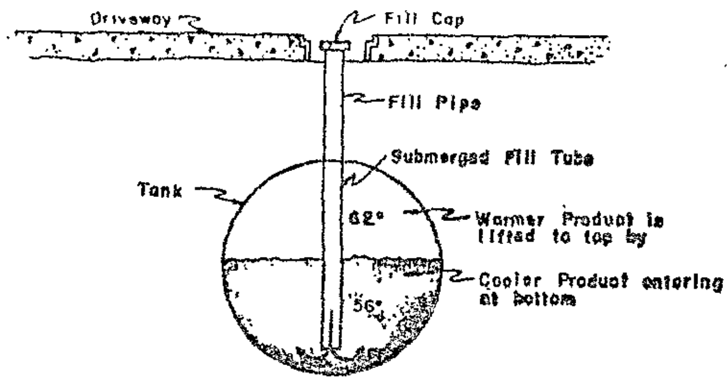


Figure 3

4-3.11.5 Temperature measurement must include a method for averaging any differences in temperature because the rate of change will not be the same. If the product in the ground prior to filling is at or close to ground temperature [62°F (16.7°C) in Figure 3] its rate of change will be nil. However, the temperature of the liquid added to fill the facility will immediately begin to change toward the temperature of the ground [56°F to 62°F (13.3°C to 16.7°C) in Figure 3]. The rate of temperature change in this case would probably average about .12°F (0.3°C) per hour. If a 4,000 gal (15 140 L) tank was half full prior to filling for the test, this would mean an average change of .06°F (0.17°C) per hour or a volume expansion of .06°F (0 17°C) × .0007 × 4,000 gal (15 140 L) = 1.68 gal (6.4 L) per hour· almost 33 times the minimum leak criteria. In this case, a leak of 1.68 gal (6.4 L) per hour or 40 gal (150 L) per day would be concealed by temperature rise.

4-3.12 **The Effect of Pressure.**

4-3.12.1 Measuring very small volumetric changes in a storage facility requires the filling of that facility to a point abovegrade where volumetric measuring equipment can be used. This increase in height of liquid increases the pressure inside the underground tank over the normal operating pressure. This is illustrated in Figure 4.

4-3.12.2 In a 6 ft (1.8 m) diameter tank the average pressure on the end or "head" of a tank full of typical gasoline is .98 psi (50 mm Hg). If the tank is buried 3 ft (1 m) under the driveway (typical for most gasoline tanks), the average pressure on the head will increase to approximately 2.95 psi (153 mm Hg) when the fill pipe and standpipe are filled to 3 ft (1 m) abovegrade. The increase of approximately 1.95 psi (100 mm Hg) in the average pressure exerts an additional force on the end or "head" of the tank of about 8,000 pounds, or 4 tons.

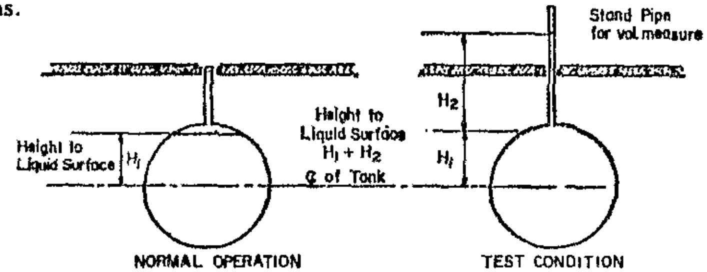


Figure 4

4-3.12.3 Most tank ends[1] of the type normally used underground are made of ¼ in. thick steel plate and will deflect outward as pressure inside the tank increases. (*See Figure 5.*)

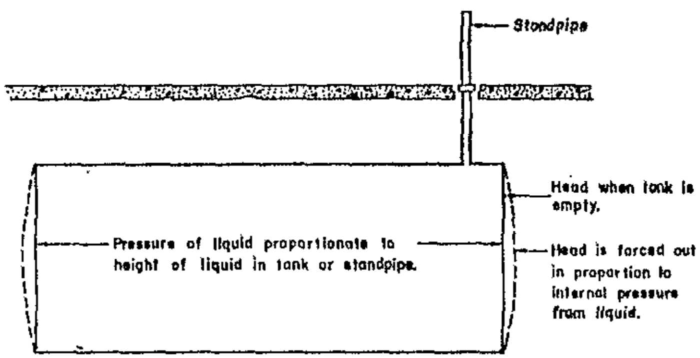


Figure 5 Tank End Deflection

[1]Although most fiberglass tanks have oval or spherical ends, the same phenomenon of expansion will occur due to flexure between the ribs on the sides of the tank.

4-3.12.4 If the tank is located aboveground and the heads are not supported in any way, it is possible to predict the amount of movement that will result from any given change in pressure and, when the amount of movement is known, the resulting increase in volume of the tank can be calculated. However, when tanks are located underground they are subject to an infinite variation in support from the surrounding soil, and it is not possible to predict how much movement will take place. Very solid soil may provide close to full support, but normally soils will consolidate to some degree, particularly if they are wet, thereby allowing tank expansion and end deflection.

4-3.12.5 Extensive study and testing have revealed that in almost all cases tank movement significant to the test for leaks will occur. It will not occur suddenly because of the time required to consolidate the soil. Under a constant increased pressure it will normally take several hours for the tank to stabilize. The table in Figure 6 shows the volume increase as a result of various degrees of movement in the tank ends. The figures underlined are the maximum normally encountered with underground steel tanks; the last figure in each horizontal row is the maximum possible for the tank size in that row.[1]

Apparent Loss of Liquid Volume in Gallons
Due to Increased Pressure in a Tank

Outward Deflection at Center of Head in Inches

Tank Dia. Inches	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
48	.49	.98	1.47	1.96	2.44	2.93	3.42					
64	.87	1.74	2.61	3.48	4.35	5.22	6.10	6.97				
72	1.10	2.20	3.31	4.41	5.51	6.62	7.72	8.82	11.0			
84	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00	15.0	18.0	21.0	
96	1.96	3.91	5.87	7.82	9.77	11.75	13.70	15.65	19.6	23.5	27.4	31.3
102	2.21	4.42	6.65	8.85	11.06	13.30	15.50	17.70	22.0	26.6	31.0	35.4
120	3.06	6.12	9.18	12.25	15.30	18.4	21.4	24.5	30.6	36.7	42.8	49.0

Figure 6

4-3.12.6 In summary, three major factors must be accounted for in the Precision Test to determine the presence or absence of a leak in an underground liquid storage facility.

1. The gross volume change in a given period of time.
2. The temperature change of the liquid in that period of time.
3. The movement of tank ends as pressure is increased.

[1]Compatible figures are not yet available for fiberglass tanks. Latest data indicates that expansion due to side flexure may exceed that for flexure of steel tanks.

4-3.13 Water Testing.

4-3.13.1 Tests involving the addition of water to a tank may be useful when tanks are empty. Water is difficult to use in cold weather. It will not detect leaks of less viscous liquids, and contamination of the storage and dispensing system can be a major problem.

Chapter 5 Tracing Liquids Underground

5-1 General. The "Underground," as referred to in this recommended practice, consists of an almost infinite variety of rocks and soils, tunneled, pierced and trenched by man-made structures and pipes. All these provide paths for movement of liquid underground. Flow of liquid in tunnels, sewer pipes, and open trenches is obvious and relatively easy to trace by observation and vapor testing. Flow in soil and rocks is a complicated matter. A few basic principles will provide an understanding that will often prove sufficient to solve many problems of tracing the source of unconfined liquids. Even though such basic understanding may prove inadequate for a particular problem, it is essential to select and coordinate the particular expert skills necessary to solve the more complex problems.

5-2 Background.

5-2.1 The principal characteristic that permits liquids to enter, and accumulate or flow through soil or rock is porosity or, simply, the space or "voids" between the particles that make up the soil or rock. The size of the voids in soil will vary from large in gravel, through small in sand and top soil, to essentially zero in fine, dense clay. Rock almost never has large voids but sandstones and limestones have voids similar to a fine sand.

5-2.2 Rate of flow through soils and rocks depends largely on the size of the voids; with large voids (gravel) the flow can be several feet per minute; medium voids (sand) will provide several feet per hour; and fine voids (shale or sandstone) may be as slow as one foot per day.

5-2.3 The term used to express this rate of flow is "pervious." A very pervious soil will permit fast liquid flow; a relatively "impervious" soil will permit only very slow flow. When the word impervious is used alone, it implies no flow; thus glass is impervious to the flow of water.

5-2.4 Porosity does not insure a pervious condition. If the pores of a rock are not interconnected, the rock will be impervious.

5-2.5 Crystalline rocks, such as granite and marble, are essentially impervious in their solid state but these rocks often have fractures or cracks that do permit flow. Rate of flow through rock fractures will vary from large continuous cracks which will act like a pipe, to very small irregular cracks which may result in flows similar to fine sand.

5-2.6 Almost all flammable and combustible liquids are lighter than water and consequently they will float on water unless they are water soluble. When these liquids escape into the ground they will normally flow down to the water in the ground and there move with that water. An understanding of groundwater flow is essential to trace flammable and combustible liquids underground.

5-2.7 Water is almost universally found underground at some level in soil or rock. It may be in very limited quantities and only "dampen" the soil. But when it fills all the voids and "saturates" the soil or rock up to a certain level, it becomes similar to water in a pail and establishes a definite top, referred to as the water table.

5-2.8 *Figure 7 illustrates that this ground water may occur in several layers underground. A porous layer between two nonporous layers may be completely filled or it may be only partially filled and have its own water table. The primary concern with unconfined flammable and combustible liquids is with the uppermost layer and its water table. However, other layers must be recognized because even though they may be very deep at one location, they may be near the surface and hence the top layer at other locations. (*See Figure 8.*)

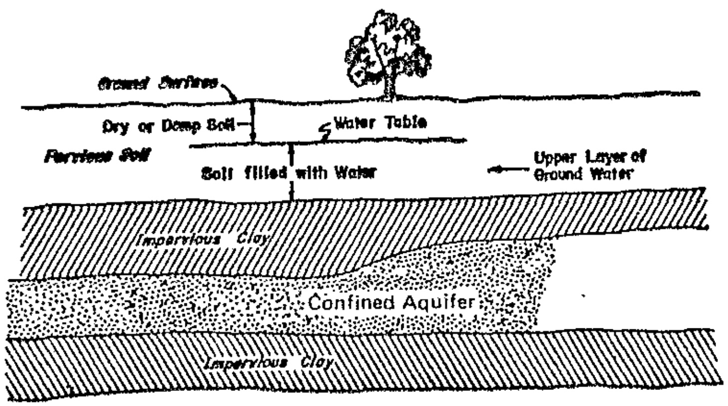


Figure 7

5-2.9 All groundwater, with the exception of narrow bands along the seacoasts, comes from rain or snow falling on the surface and flowing down into the soil. Figure 8 shows that, at any given location, the water may have come from rain or snow on the surface immediately above; or it may have flowed underground for long distances through pervious soil or rock from a point where the pervious layer "outcrops" or comes to the surface. Water from rain and snow may also flow to lakes and rivers and then into underground layers.

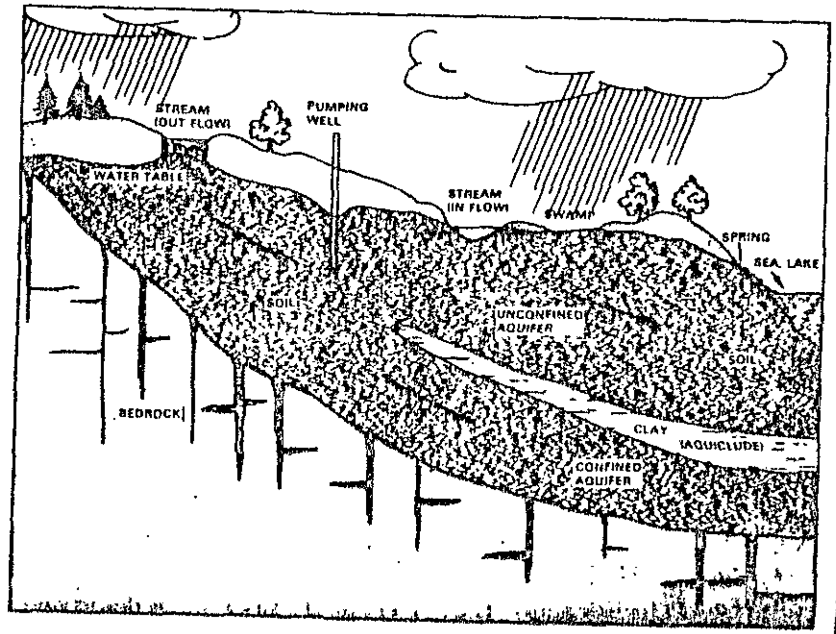


Figure 8 Hypothetical Groundwater System

5-2.10 Water tends to seek its own level underground just as it does on the surface as it flows through the soil. However water flowing underground will not flow as fast as water on the surface because of the interference or resistance of the particles in the soil. This has the effect of steepening the slope of the water table because the water does not move through the soil to lower levels as fast as it fills the soil at the higher elevation. The same effect is shown where the lake is supplying water to the pervious soil. Expressed in another way, pressure is required to overcome the resistance to flow, and the increase in elevation of the water table provides the necessary pressure.

5-2.11 The height or elevation of the water table will not only depend on how fast the water flows out of the strata, but also on how fast it is fed into the strata by rain or melting snow. When no water is being added, the water table will drop as water flows out at springs and is taken out by wells, or "wicks," through dry soil to eventually evaporate into the air. When water is being added faster than it flows out, the water table will rise. This rise and fall can be several feet in a few days as the weather changes from wet to dry, or from dry to wet.

5-2.12 In summary, the principal factors important to tracing unconfined liquids underground are:

1. Most flammable and combustible liquids float on water.

2. When unconfined in the ground, these liquids will float on the top or water table of the groundwater and move with that water.

3. Groundwater will flow through pervious soil or rock toward lower elevations. Flow rate will vary from several feet per minute to only one or two feet per day.

4. Groundwater may be trapped underground and be stationary as if in a lake.

5. The top or water table will be level with no flow but slope down in the direction of flow when flow occurs.

6. The water table will rise and fall (in some cases several feet in a few days) depending on supply by rain or melting snow.

5-2.13 The following examples illustrate how these principles are applied to tracing flammable and combustible liquids.

5-2.13.1 Figure 9 shows the effect of the slope of underground strata on the direction of flow of liquids. A and B show identical surface conditions. A four story apartment building is approximately midway in the block, between two streets 400 ft (122 m) apart. The surface of the ground slopes up from left to right at a 5 percent grade, placing the elevation of the upper street (on the right) 20 ft (6 m) higher than the lower street.

5-2.13.2 In Figure 9-A, the underground strata follows the general slope of the surface and groundwater in the sand and gravel layer flows from right to left. Under these circumstances, if gasoline in liquid or vapor form was discovered in the subbasement of the apartment building, the source of that gasoline would most likely be from the service station on the right at the higher elevation, or from other tanks farther up the hill.

5-2.13.3 However, Figure 9-B shows an underground strata condition in which the station downhill is the most probable source. In this case, the water-bearing strata of sand and gravel slopes down from left to right, opposite that of the surface of the ground. Groundwater flow would also be from left to right and would carry gasoline escaping from the lower station to the basement of the apartment building.

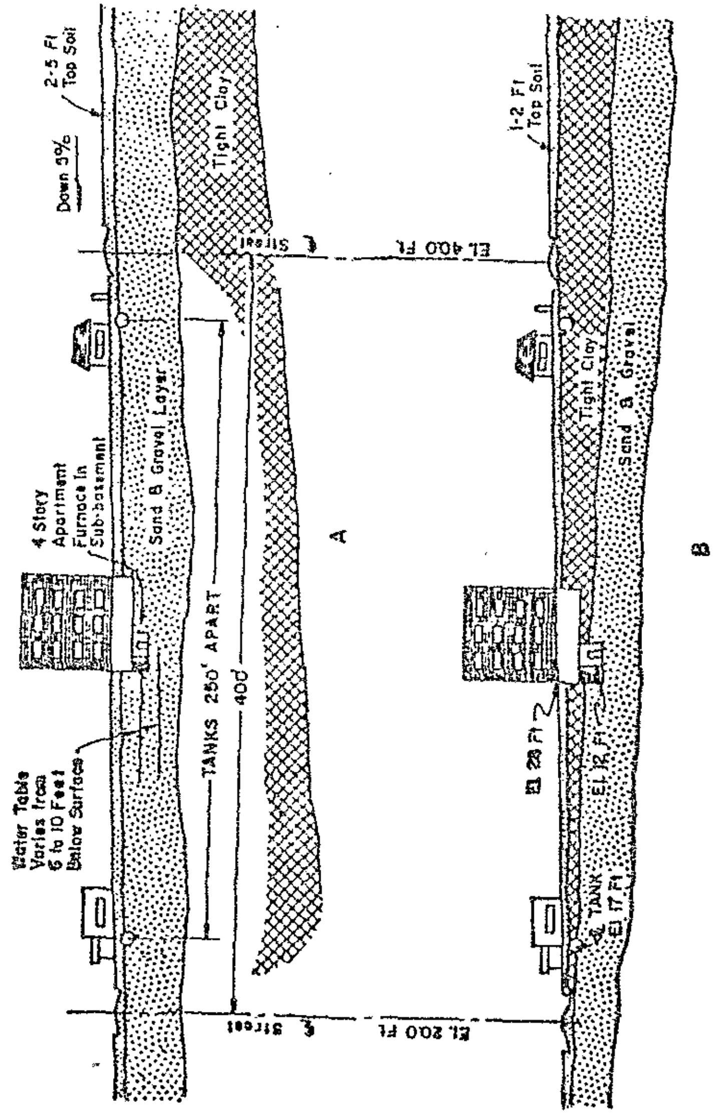


Figure 9

5-2.13.4 One other condition illustrated in Figure 9-A is the effect of a rising and falling water table. During the dry season, when the water table is below the subbasement floor of the apartment building, gasoline on the water table would not be discovered. But when the water table rises the gasoline will be lifted above the subbasement floor. There have been many cases where this was the cause of alternating discovery and disappearance of escaped gasoline due to a significant rise in the water table with each significant rain.

5-2.13.5 Figure 10 illustrates another example of how underground water flow can be contrary to the surface slope of the ground. In this case, flammable liquids are stored in an underground tank a few hundred feet from, and 30 or 40 ft (9 or 12 m) above, a small lake. From the surface, it would appear that an escape of liquids from this tank would show up in the lake. But, because the tank is in a pervious water-bearing layer that slopes away from the lake, wells at houses high above the service station are contaminated by the gasoline that has escaped.

Figure 10

Note also that if an underground leak existed unknown for a long period of time and there were no wells in the strata to discover contamination, the first discovery of escaped flammable or combustible liquids could occur in the telephone cable conduit on the other side of the hill from the service station, possibly several miles distant.

5-2.13.6 Figure 11 illustrates other important effects of a rising and falling water table and the ability of trenches dug in relatively impervious soil but filled with sand or other porous material to act like interconnected piping. Figure 11-A is a phantom view of a tank containing gasoline installed in a hole dug in clay and backfilled with sand. The suction and vent lines are likewise in trenches dug in clay and backfilled with sand.

5-2.13.7 Figure 11-B is a plan showing the layout of a tank installed next to a building with a basement. A water line to the building on the left is also a trench backfilled with sand as is the city water main and sewer. And, finally, a low area between the buildings was filled with sand and gravel during construction.

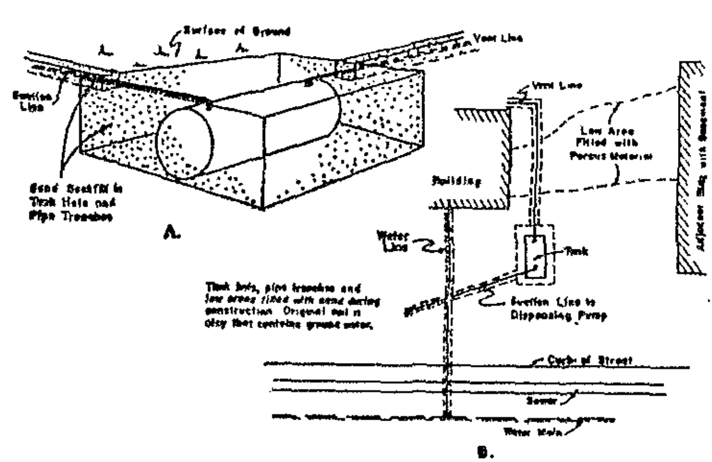


Figure 11

5-2.13.8 The "parent" or original soil is clay. A water table exists in the clay but has very little horizontal movement because of the resistance of the clay to flow. As a consequence, the water table rises and falls in direct response to supply of water from rain. During wet periods the water table will be within a foot of the surface and during dry periods will drop to or below the bottom of the tank hole.

5-2.13.9 It is easy to see how a leak in this tank could cause a collection of gasoline on a low water table in this hole much as if it were in an open square tank. Then, if rainfall raised the water table above the bottom of the pipe trenches, water with gasoline on top could flow along the sand-filled trenches much as it would through a pipe. At points where the trenches intersected other trenches or the sand and gravel fill between the buildings, the flow could find its way to the building or to the sewer or water main in the street.

5-2.13.10 Note that it will not necessarily enter the sewer pipe in the street. The water and gasoline may flow along the outside of the sewer or water pipe in the porous backfill of those pipe trenches and not appear until it comes to some point where it could leak into a manhole or sewer inlet.

5-2.13.11 Another condition illustrated by Figure 11 is the potential for a flammable or combustible liquid to move without the aid of groundwater. If a severe leak occurred in the suction line, pure gasoline could flow along the trenches.

5-2.13.12 The principles and concepts discussed in the preceding pages point up the importance of knowledge about underground soil conditions and underground facilities when tracing the source of escaped liquids. It will not always be possible to obtain all the data desired but the effort should be made.

5-3 Test to Determine Underground Flow.

5-3.1 The sequence of what to inspect and what test to use will depend to considerable degree on the circumstances of the problem, information gained from the Primary Search, and previous tests. Consequently, the following methods are not necessarily in the proper sequence for all conditions. They are, however, in an approximate descending order of importance. Tools are noted as they are needed.

5-3.1.1 On a sketch of the local area (Scale from 1 in. = 100 ft) note underground facilities as illustrated in Figure 11-B and any geological data available. Be sure to include abandoned ditches and streambeds that have been filled and covered. Sources of information are:

(a) Surface observation of manholes, fill pipes, pumps, vent risers, etc.

(b) City engineer; sewer, water and street departments; highway engineer; city, state, and federal geological departments.

(c) Utility companies.

(d) Owners of the facilities and local residents. Do not overlook the old-timer who may have valuable knowledge of the area before it was built up

(e) Metal detectors can be used to locate steel pipe if conditions warrant.

5-3.1.2 Information gathered to this point and plotted on the sketch may indicate that a certain nearby facility is a very likely source. If so, proceed with a test for leaks as described in Chapter 4. If not:

5-3.1.3 Check potential paths for liquid flow by:

(a) Visual check in manholes, inlet boxes, wells, open trenches, exposed slopes or cuts, etc. Put samples of water in a glass bottle for close inspection to determine the possible presence of flammable liquids.

(b) Use a combustible gas indicator to determine presence of vapors. To check underground porous backfill or pervious strata use a bar (¾ in. to 1 in.) and a sledge hammer to drive a hole to the level to be checked. A small hand-operated earth auger is very useful for this purpose. A larger auger, as used for power posthole digging, is also good and has the added advantage of providing a visual check and the opportunity to obtain both liquid and soil samples. This equipment is usually available from a state highway department. Maintain an accurate log of soil samples, and, in particular, note the top and bottom depths at which any soil samples have an odor indicating contamination. Retain representative samples of soil in vapor-tight containers.

(c) Use a rod or stick with water-finding paste and a paste sensitive to the contaminating liquid to determine the water table elevation. Note these elevations on the sketch and determine the probable direction of flow.

5-3.1.4 If the potential of natural or sewer gas still exists at this point in the search, make particular note of indications by the combustible gas indicator relative to the location of sewer and gas lines.

5-3.1.5 When this testing has determined the probable direction from which the contamination is coming, extend the search upstream using these same methods to determine the next most likely source. Check on both sides of the direction of flow to determine its width.

5-3.1.6 There is new technology to determine ground water flow direction without the need for drilling numerous test wells.

5-3.1.7 As the area of search extends beyond the original sketch, obtain a smaller scale map or sketch, plot and record all data. As the area becomes larger, the data becomes more important to the search and subsequent disposal of contamination.

5-3.1.8 If the initial efforts, approximately one day's checking, fail to establish a clearly defined problem, additional expert help should be engaged. Ask industry for the assistance of experts who have had experience with these problems; and, whenever possible, obtain help from a local geologist familiar with local geology.

5-3.1.9 It is beyond the scope of this recommended practice to cover the problem in all its potential complexities; that is the purpose of seeking the assistance of experts. However, it will probably be advisable for those originally in charge to maintain control while the experts act as consultants and advisors. The following information will be helpful in understanding, appraising and coordinating the expanded effort.

5-3.1.10 When the investigation fails to locate an active source of seepage, it is possible that the product could be a residual accumulation from some previous equipment failure, spill, or improper disposal of petroleum product. Experience has indicated that many such residual deposits have existed and remained undetected over a long period of time before they became sufficiently large to make their presence known.

5-3.1.11 As the problem becomes more complex, other methods of testing and tracing may be helpful or suggested. However, both the advantages and disadvantages of these tests must be recognized if valid conclusions are to be reached.

5-4 Other Tracing Test Methods.

5-4.1 Dye.

5-4.1.1 The use of dye is often suggested as a means of tracing. The method is to add a strong dye to the stored liquid suspected of being the source and see if it shows up at the point of discovery. This is seldom successful for several reasons.

(a) Dye may cause pollution of underground water supplies.

(b) If only vapor is found at the discovery point, dye will be useless.

(c) The dye may be leeched out or bleached by chemicals in the soil before it reaches the point of discovery.

(d) If underground flow is very slow, too much time will be consumed in the tests.

(e) It may very likely make the liquid tested unusable.

(f) If it is used but does not appear at the point of discovery, it is not conclusive because of item c. It would be of benefit only if it did appear.

5-4.1.2 Dye is not a recommended method of tracing but may be used as one possible source of information in special cases.

5-5 Chromatographic and Spectrographic Identification of Components.

5-5.1 The chromatograph and spectrograph are instruments capable of detecting traces of elements in almost any compound. They can, for example, detect a trace of some element unique to a particular method of manufacture and therefore identify where the liquid originated. They can also detect the amount of an element involved. They are relatively inexpensive tests and only involve a sample of the product found at the point of discovery. These tests should be used in complex cases of products as a possible source of additional information. However, they may not be conclusive because some identifying element may be lost in the ground, or an element not in the original liquid may be picked up from the ground or from contact with buried materials.

5-6 Other Chemical Analysis.

5-6.1 Any other chemical analysis is essentially the same as the chromatographic test and the same comments apply to both. One significant factor that may be determined by chemical analysis is the age of the contaminant.

Chapter 6 Removal and Disposal

6-1 The presence of unconfined flammable and combustible liquids will continue to be a potential hazard until the contamination has been reduced to a safe level. While methods by which this can be accomplished depend upon the physical circumstances of the polluted areas, the most effective results are obtained when the efforts of all interested parties are coordinated under the direction of the fire marshal's office or other enforcing authority. It is their inherent authority to recommend compliance in all phases of the cleanup operation, and it is their recognized responsibility to the public to exercise this jurisdiction from the moment that migration of flammable liquid or vapors in sizable volume is reported until safety is assured.

6-2 Removal and disposal methods will depend on the liquid involved and the area contaminated.

6-3 The characteristics of liquids significant to methods of removal and disposal are:

1. Liquids that rapidly vaporize at ambient temperatures and leave little or no residue. Typical examples are solvents and gasolines. These are referred to as "volatile" liquids.

2. Liquids that do not readily vaporize. Typical examples are heating oils and food processing oils. These are referred to as nonvolatile liquids.

6-4 In general, purging a facility of volatile liquids is primarily a matter of ventilation, while nonvolatile liquids must be collected and picked up.

6-5 The principal categories of area relating to methods of removal are:

6-5.1 Normally inhabited subsurface structures.

(a) Basements and similarly confined areas.

(b) Subways, tunnels and mines.

6-5.2 Normally uninhabited substructures (*see NFPA 328, Control of Flammable and Combustible Liquids and Gases in Manholes, Sewers, and Similar Underground Structures*).

(a) Utility conduits.

(b) Sewers.

6-5.3 Water surfaces.

6-5.4 The soil.

(a) Surface.

(b) Subsurface.

6-6 Basements.

6-6.1 With very few exceptions, the quantity of liquids found in basements will be relatively small, as detection will normally occur before significant quantities can accumulate and further flow will be quickly stopped. When volatile liquids and their vapors are involved, the primary removal and disposal action is ventilation as described in 2-3.4. Small amounts of liquid not evaporated can be picked up with rags or commercial absorbents.

6-6.2 Be sure to put contaminated rags or absorbents in covered metal containers to prevent further spread of vapors. Final cleanup is accomplished by flushing out basement sumps and floor drains with water and washing down contaminated surfaces. Only water is necessary for flushing volatile liquids from drains; biodegradable detergents may be used on surfaces. *Maintain ventilation and checks for vapor throughout the cleaning period.*

6-6.3 In those rare cases involving relatively large volumes of volatile liquids, ventilation may not be able to sufficiently reduce the vapor concentration to a safe level due to continuing evaporation from the liquid. In such cases, bail or pump the liquid into barrels, drums or tank trucks, and dig holes outside the structure to prevent further contamination (*see Section 6-11*).

6-6.4 When nonvolatile liquids (fuel oils, etc.) are involved, ventilation will not be an effective method of removal. Use absorbents for thin films or solid surfaces. Whenever possible, pick up liquids with pumps or by bailing. Put water mixtures into barrels or drums for separation by settling. Siphon off the water and carry the contaminating liquid to a disposal facility (*see Figure 12*). If final cleanup requires flushing sumps and drains and washing surfaces, check with local sanitation and pollution authorities before flushing such liquids into sewers.

6-7 Subways, Tunnels and Mines.

6-7.1 If only small amounts of volatile liquid are involved, ventilation may be adequate to permit entry and possibly even continued use of the facility. In such cases, the same removal and disposal methods as described previously for basements may be used. However, additional precautions must be employed because of

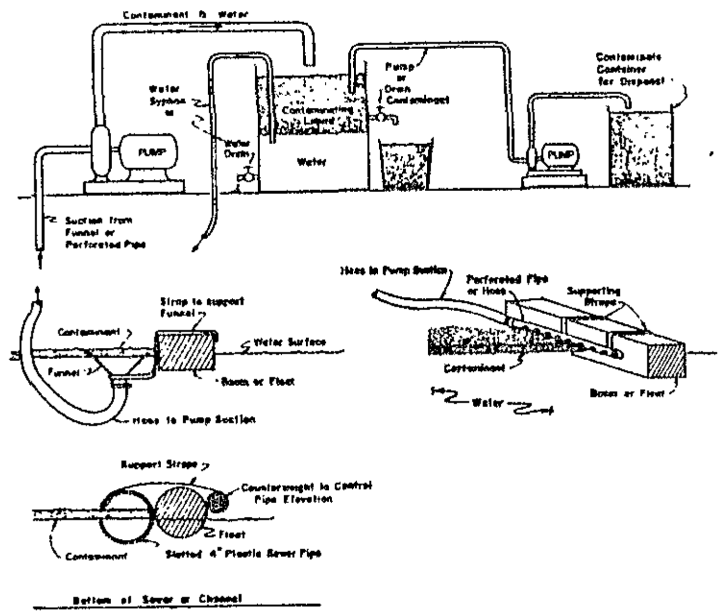


Figure 12

greater exposure to the public and, normally, more exposure to sources of ignition. The authority responsible for the facility, the fire department, and police must effect a cooperative effort for maximum safety.

Subways, tunnels and mines will normally have much greater exposure to underground seepage than other substructures such as basements. Consequently, even though entry of a flammable liquid is thought to have been stopped, monitoring with a combustible gas indicator must be continued for an extended subsequent period to ensure against recurrence. Maintain a constant check for at least 24 hours after cleanup.

6-7.2 If results are negative, extend check periods to 8, 12, or 24 hours depending on use of the facility. Subsequent checks should be continued to include extreme conditions of groundwater changes. Significant rainfall and rising groundwater may carry additional liquids from the soil.

6-7.3 If relatively large amounts of volatile liquids are involved or leakage continues, it may be necessary to close the facility to the public and suspend normal operations. Maintain ventilation, and

provide a pumping point, and pump liquids out with explosion-proof equipment. Use a drum or tank for separating water by settling; transfer the volatile liquids to drums or tanks for transport to disposal facilities (*see Figure 12*). Consult with the authority operating the facility to determine the degree to which flushing and cleanup is necessary. Normally, once further entry of volatile liquids has been stopped, such facilities can be adequately purged of volatile liquids with reasonable periods of ventilation.

6-7.4 When nonvolatile liquids are involved, the potential for fire or explosion is greatly reduced. However, make sure that continued use or operation does not present a potential ignition source; for example, it may be necessary to deactivate high power electric lines and tracks if they are anywhere near the contaminating liquid.

6-7.5 Absorb, bail or pump the liquid as appropriate, using drums or tanks for separation by settling, and remove the nonvolatile liquid for transport to disposal facilities. Consult with the authority operating the facility to determine the acceptability of using detergents, dispersants or coagulants for final flushing and cleaning. As with volatile liquids, periodic monitoring must be performed to detect any possible recurrence. Use the same time periods and groundwater changes as described above for volatile liquids.

6-8 Utility Conduits.

6-8.1 Removal and disposal methods for these facilities are different from the other substructures previously covered for three principal reasons:

1. Normally, concentrations of contaminating liquids will be much higher because early discovery and preventive measures are unlikely.

2. Access to entry points and contaminated areas is usually from manholes but in some cases such access is not available.

3. Exposure and danger to the public are greatly reduced. The utility operator must be consulted on all details of the proposed purging procedures; his special knowledge is essential in such work and normally he will select the exact procedures and techniques used.

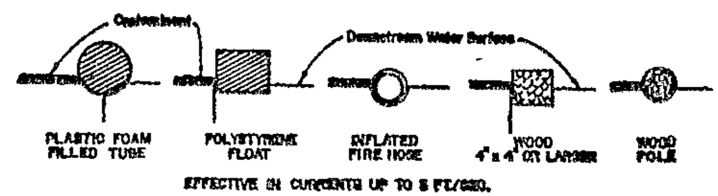
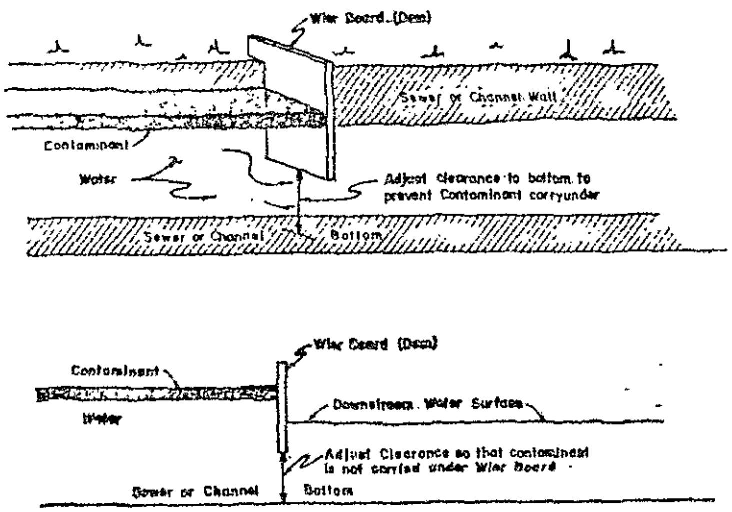


Figure 13

6-8.2 Where water is mixed with the contaminating liquid, it is preferable to separate the two by settling in drums or tanks to avoid contamination of downstream drainage facilities.

6-9 Sewers.

6-9.1 Sewers, on occasion, may collect flammable or combustible liquids from a surrounding contaminated area, and it is seldom practical to effectively seal off all entry points. Consequently, removal of contaminating liquids will normally be a continuing effort until the entire area is purged. When relatively large amounts of the contaminating liquid are involved, every reasonable effort should be made to divert the affected sewer flow to a separator where water and contaminant can be separated by gravity. If this is not practical, it may be possible to set up a skimming facility somewhere on the stream flow. One method is to throw a floating boom of polyurethane foam or an inflated tube such as a fire hose across the stream flow. If the contaminant is mostly on top of the water and surface flow is not turbulent, significant amounts of the contaminated liquid can be trapped behind the boom and removed with skimmer pumps and/or absorbent materials (*see Figures 12 and 13*). Weir boards can be used in the same way by raising them to permit water flow underneath and should be used whenever possible because of their greater efficiency, particularly when flow rates exceed 3 ft (1 m) per second (*see Figure 14*).



When current flow exceeds 3 ft/sec, Contaminates can be trapped by creating a difference in upstream and downstream surface with a Baffle or Weir Board.

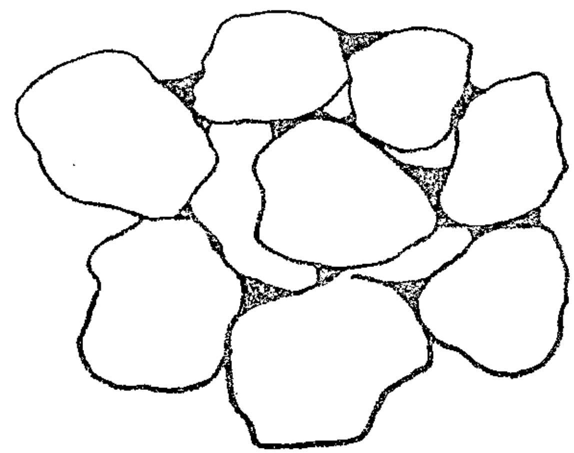
Figure 14

6-9.2 When relatively small amounts of liquid are involved, or the contaminating liquid is mixed with the water, settling tanks or basins must be used for separation by gravity (sewage treatment plants may have such facilities).

6-9.3 Water surfaces, as referred to in this chapter, are those on top of the ground exposed to the open air. When such contamination exists, the problem should be referred to the proper water pollution authority. Water surfaces underground, such as in sewers, are covered in Sections 6-8 and 6-9.

6-10 Underground Soil Contamination.

6-10.1 A knowledge of the local geology is basic to effective removal of flammable and combustible liquids from subsurface areas. Consequently, a geologist, familiar with the area, should be consulted whenever possible.



After a liquid has passed through a porous soil each particle will be coated with a thin film of that liquid and surface tension will hold small amounts of that liquid in corners of the voids as shown here in the dark areas.

Figure 15

6-10.2 The removal of flammable or combustible liquids from underground will involve gathering of the liquid in some pooling point, generally from the top of groundwater, or mixed in with that groundwater. However, the liquid will often be present above the water table as well as on it, and removal and disposal is not complete until this liquid is also purged. Some concept of how this occurs is essential to an understanding of methods of removal. Reference to the discussion on geology in Chapter 5 will be helpful. When a liquid is released into a porous soil or rock, gravity will pull it downward through the pores or cracks. As it moves, some will be left behind on the surface of each particle that it contacts and some will be suspended by surface tension between two surfaces that are nearly in contact (*see Figure 15*).

6-10.3 The liquid will continue to move downward until the supply is exhausted by the coating action and by retention in the corners of the voids or until it reaches a barrier such as an impervious layer of soil or rock or the water table. If the supply of liquid continues after the barrier has been reached, the lower portion of the porous layer will begin to fill (*see Figure 16*).

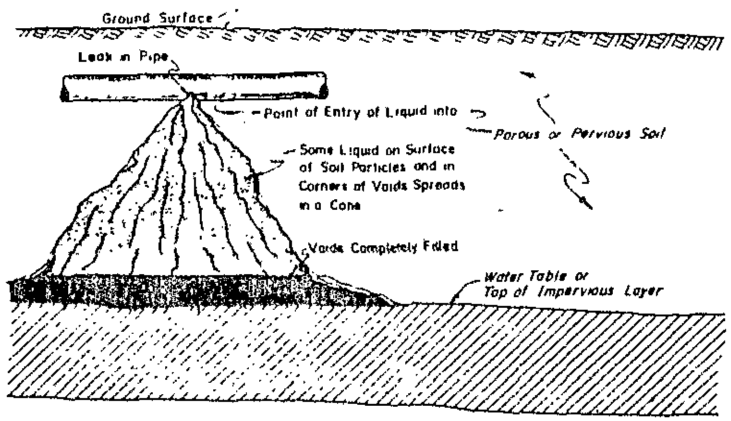


Figure 16

6-10.4 If the barrier is the water table and the groundwater is moving, the contaminating liquid will tend to move with it. However, most of the contaminating liquid that has remained up in the porous soil above the water table will stay there until it is washed down by subsequent rainfall or other water flowing down through the contaminated soil.

6-11 Removal of Liquids.

6-11.1 Trenches.

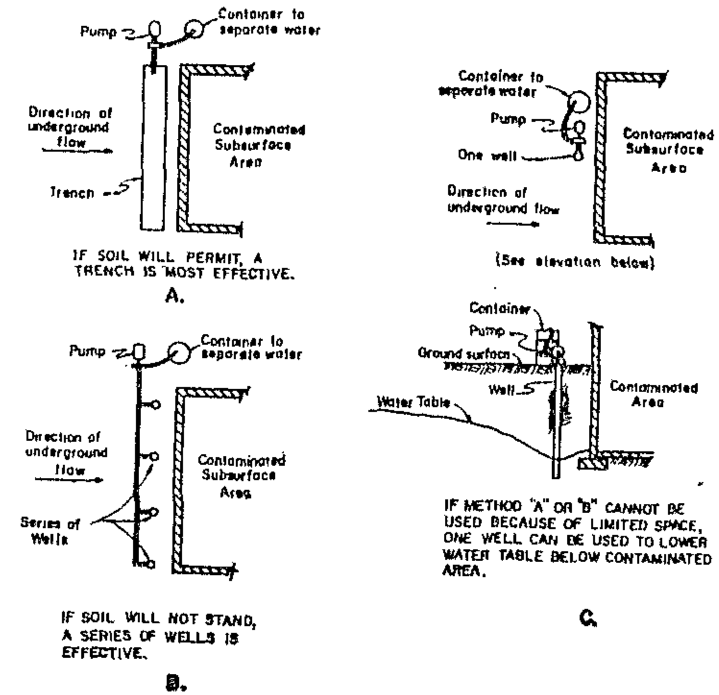


Figure 17

6-11.1.1 Sometimes the same method used for removing liquids from underground will serve to limit further spread. An intercepting hole or holes or trench illustrated in Figure 17 and Figure 18 are such methods. It will greatly improve the ability of the trench to prevent escape of the contaminating liquid if the downstream side of the trench at the water surface is lined with an impervious barrier. Figure 17 further illustrates various methods of using wells or trenches as interceptors upstream of contaminated buildings.

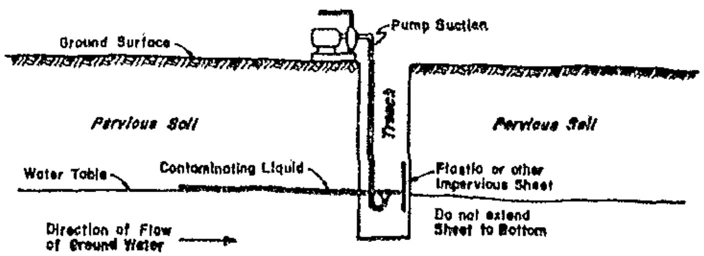


Figure 18

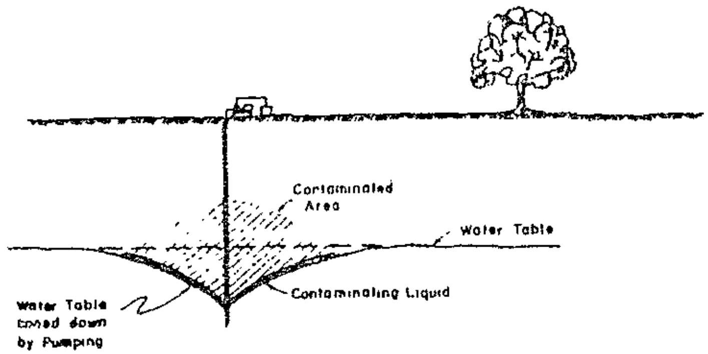


Figure 19

6-11.2 Wells.

6-11.2.1 Recovery wells can be used instead of intercepting trenches. These wells are practical in cases when the contaminated strata is both shallow and deep. A cone of depression is created by lowering the water level in the well below the surrounding natural water table. Flammable liquids will then migrate along the top of the water table into the well (*see Figures 20 and 21*) This procedure will establish an underground funnel radiating outward in all directions.

6-11.2.2 Care must be exercised in drilling and casing monitoring wells to ensure that the proper depth is not exceeded and that the well does not create conduits through impermeable layers.

6-11.2.3 When the area is extensive, a line of recovery wells with overlapping cones of depression can be used to create an effective underground barrier preventing the further migration of contaminant, while at the same time collecting it for removal.

6-11.2.4 If significant lowering of the water table near buildings is possible check with local engineering authorities to ensure against damage to substructures. (*See API 1628, Underground Spill Cleanup Manual, for additional information.*)

6-11.3 Pumping the Contaminant Out.

6-11.3.1 Refer to Figure 12 for the method of separating the oil and water mixture once it is raised to the surface. If large quantities of water are involved, bolted steel tanks can be obtained in sizes of several thousand gallons.

6-11.3.2 If the water table is reasonably shallow, two methods are available for removing the volatile liquid. One, a recovery well using a cone of depression to cause the contaminant to flow into the well.

Floating filter buoys, skimmer and pumps (*see Figure 22*) are available to collect and remove the contaminant Two, if soil conditions permit, a trench may be dug (*see Figure 18*) and the same floating filter buoys and skimmers may be used.

It should be noted that the cone of depression will greatly speed the recovery process since it is drawing the spilled liquid to the recovery point.

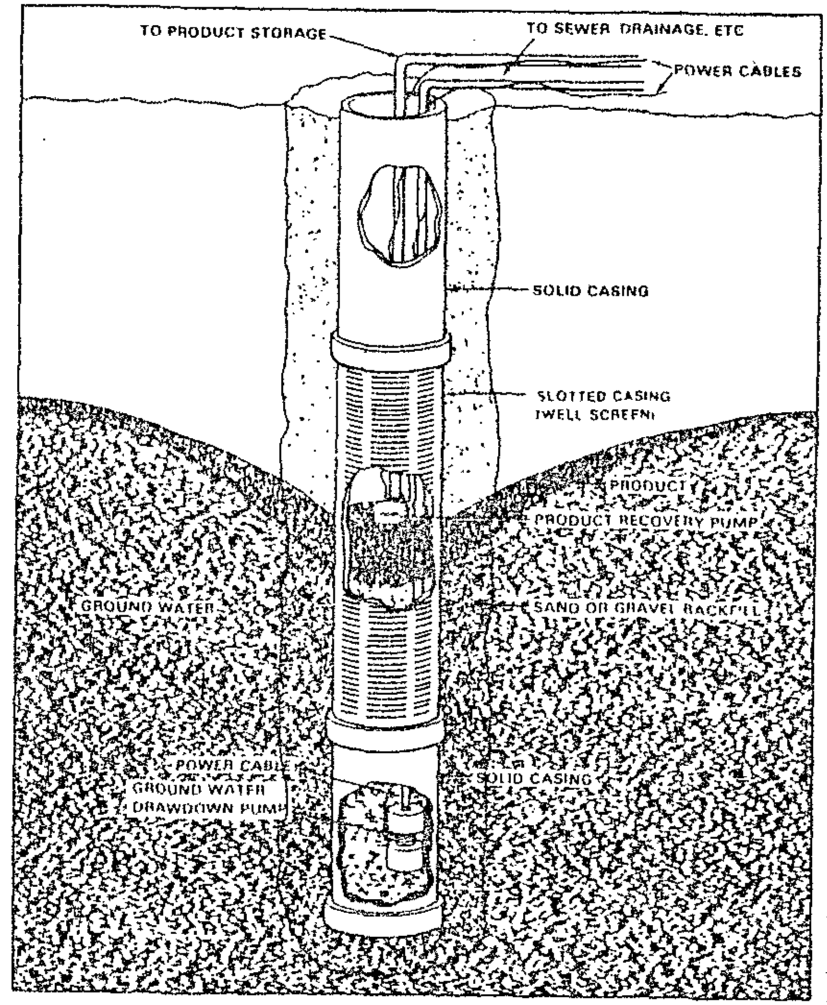


Figure 20 Double Pump Recovery Well

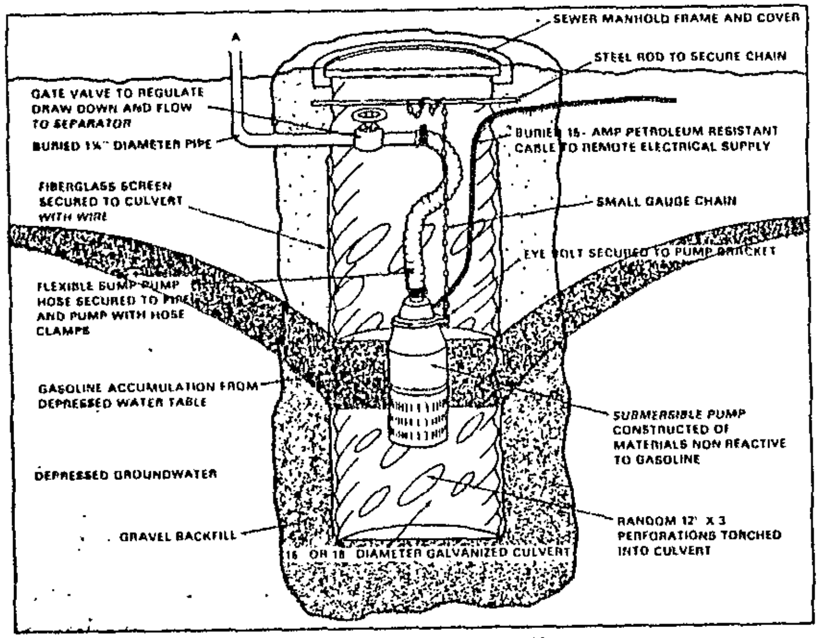


Figure 21 Recovery Well

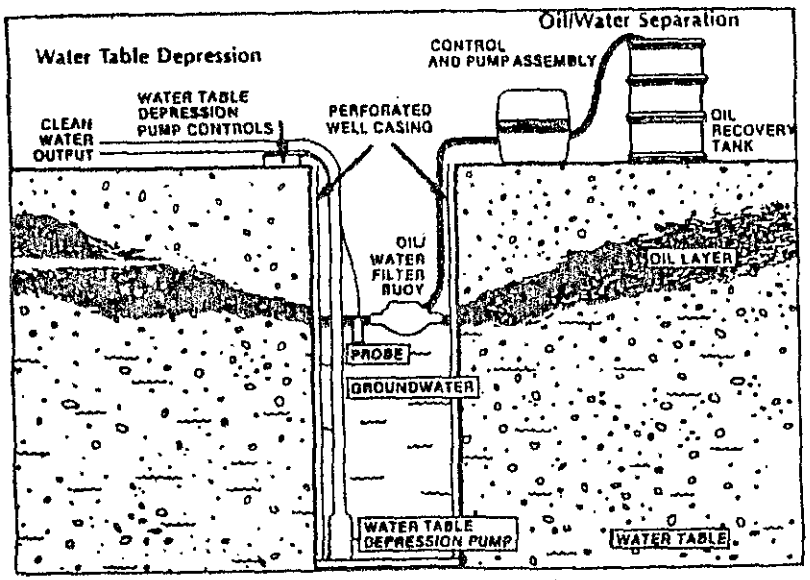


Figure 22 Recovery from Groundwater Using Filter and Water Table Depression Probe Pump.

6-11.3.3 *If the water table is reasonably shallow [20 ft (6 m) or less]* and the soil permits the digging of a trench, a "skimmer" suction at the top of the water table can be used. Figure 20 illustrates one method of skimming by using a funnel on the end of the suction hose mounted on the end of a pole for control.

6-11.3.4 Another method of skimming at shallow depths is illustrated *in Figure 21*. The depth at which this can be done will depend on the pump used. There are several available for use in decorative fountains; most will have a lift of 8 ft to 10 ft (2.5 to 3 m), but some special units are available for lifts up to 20 ft (6 m). The *pump is lowered by a rope or wire into the hole upside down to a level* where its suction is just covered by the liquid surface. It is run intermittently or continuously depending on how fast the contaminating *liquid* is being generated.

6-11.4 Disposal.

6-11.4.1 *In disposing of mixtures* of contaminated material, local regulatory officials should be consulted to ensure that the disposal method has their approval.

Appendix A

This Appendix is not a part of the recommendations of this NFPA document, but is included for information purposes only.

Physical Properties
Common Flammable and Combustible Liquids

	Flash Point °F (°C)	Flammable Limits Lower	Upper % by Vol	Specific Gravity Water - 1 0
Acetone	-4 (20)	2 16	13	0 8
Amyl acetate	60 (16)	1 1	7 5	0 9
Amyl alcohol	91 (33)	1 2	10	0 8
Benzene (Benzol)	12 (11)	1 3	7 1	0 9
Butyl acetate	72 (22 2)	1 7	7 6	0 9
Butyl alcohol	84 (28 9)	1.4	11.2	0 8
Carbon disulfide	22 (30)	1 3	50.0	1 3
Ethyl acetate	24 (4 4)	2 0	11 5	0 9
Ethyl alcohol	55 (12 8)	3 3	19	0 8
Ethyl benzene	59 (15)	1 0	6.7	0 9
Fuel oil (diesel furnace & kerosene)	100 130 (37 8 54 4)	0 7	5	< 1.0
Gasoline	-45 (43)	1 4	7 6	0 8
Heptane	25 (3 9)	1 05	6 7	0.7
Hexane	7 (21 1)	1 1	7.5	0 7
Isopropanol	53 (11.7)	2 0	12 7	0 8
Methyl alcohol	52 (11 1)	6 0	36	0 8
Methyl cyclohexane	25 (3 9)	1 2	6.7	0 8
Naphtha (high flash)	85 (29 4)	1.0	6 0	< 1.0
Naphtha (regular)	28 (2 2)	0.9	6.0	< 1 0
Stoddard solvent	100 130 (37 8 54.4)	0.7	5	< 1 0
Toluene	40 (4 44)	1.2	7.1	0.9
Xylene-o	90 (32 2)	1 0	6.0	0.9

Appendix B Referenced Publications

B-1 This portion of the Appendix lists publications which are referenced within this NFPA document for information purposes only . . . and thus is not considered part of the recommendations of the document.

B-1.1 NFPA Publications. The following publications are available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NFPA 30-1981, *Flammable and Combustible Liquids Code.*

NFPA 328-1982, *Recommended Practice for the Control of Flammable and Combustible Liquids and Gases in Manholes, Sewers, and Similar Underground Structures.*

B-1.2 Other Publications.

ASTM D 1250-80, *Petroleum Measurement Tables*

API 1628-1980, *Underground Spill Cleanup Manual.*

Official NFPA Definitions

Approved: *means "acceptable to the authority having jurisdiction."*

Note: *The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.*

Authority Having Jurisdiction: The "authority having jurisdiction" is the organization, office, or individual responsible for "approving" equipment, an installation, or a procedure.

Note: *The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local, or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."*

Labeled: Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed: Equipment or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

Note: *The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.*

Shall: indicates a mandatory requirement.

Should: indicates a recommendation or that which is advised but not required.

Notes and footnotes are informatory only and are not mandatory.

Statement on NFPA Procedures

This material has been developed under the published procedures of the National Fire Protection Association, which are designed to assure the appointment of technically competent Committees having balanced representation. While these procedures assure the highest degree of care, neither the National Fire Protection Association, its members, nor those participating in its activities accepts any liability resulting from compliance or noncompliance with the provisions given herein, for any restrictions imposed on materials or processes, or for the completeness of the text.

NFPA has no power or authority to police or enforce compliance with the contents of this document and any certification of products stating compliance with requirements of this document is made at the peril of the certifier.

Bibliography of NFPA Standards

1 Fire Prevention Code
3M Health Care Emerg. Preparedness
10 Portable Extinguishers
10L Model Enabling Act
11 Foam Ext. Systems
11A Medium and High Expansion Foam Syst
11C Mobile Foam Apparatus
12 Carbon Dioxide Systems
12A Halon 1301 Systems
12B Halon 1211 Systems
12C Halon 2402 Systems
13 Sprinkler Systems
13A Sprinkler Maintenance
13D Sprinkler Sys., Dwellings
13E Sprinkler Prop., F.D. Operations at
14 Standpipe, Hose Systems
15 Water Spray Fixed Syst
16 Deluge Foam-Water Systems
16A Closed Head Foam-Water Sprinkler Systs
17 Dry Chem. Ext. Systems
18 Wetting Agents
20 Centrifugal Fire Pumps
21 Steam Fire Pumps
22 Water Tanks
24 Private Fire Service Mains
26 Supv'n, Water Supply Valves
27 Private Fire Brigades
291 Fire Hydrants
295 Wildfire Control
30 Flam. Liquids Code
31 Oil Burning Equipment
32 Drycleaning Plants
321 Class. Flam. Liquids
325M Prop. Flam. Liquids
327 Cleaning Small Tanks
328 Manholes, Sewers, Flam. Liquids *and Gases in*
329 Underground Leakage, Flam. Liquid Tanks
33 Spray Application
34 Dipping and Coating Processes
35 Mfg. Organic Coatings
36 Solvent Extraction
37 Combustion Engines
385 Tank Vehicles
386 Portable Shipping Tanks
395 Farm Stg. Flam. Liquids
40 Motion Picture Film
40E Pyroxylin Plastic
43A Liquid, Solid Oxidizing Materials
43C Gaseous Oxidizing Materials
43D Pesticides in Port. Containers
44A Fireworks, Mfg. Trans. Stge
45 Labs Using Chemicals
46 Forest Products, Storage
48 Magnesium
481 Titanium
482 Zirconium
49 Hazardous Chem. Data
490 Ammonium Nitrate
491M Chem. Reactions
493 Intrinsically Safe Apparatus
495 Explosives, Stge., Use
496 Purged Enclosures
497 Class. of Class I Haz. Locations for Elec. Inst
497M Class. of Gases, Vapors, Dusts for Elec. Equip. in Haz (Classified) Locations
498 Explosives, Motor Term
50 Bulk Oxygen Systems
50A Gaseous Hydrogen Syst
50B LH Syst., Consumer Sites
51 Welding and Cutting
51A Acetylene Charging Plants
51B Welding Processes
53M Oxy. Atmospheres
54 Nat'l Fuel Gas Code
56A Inhalation Anesthetics
56B Respiratory Therapy
56C Labs in Health Inst
56D Hyperbaric Facilities
56E Hypobaric Facilities
56F Nonflam. Med. Gases
56G Inhalation Anesthetics, Amb. Facil
56HM Home Resp. Therapy
56K Medical-Surgical Vacuum Systems
58 LP-Gas Storage, Use
59 LP-Gas, Utility Plants
59A LN Gas. Stg., Handling
61A Starch, Mfg., Handling
61B Grain Elevators
61C Feed Mills
61D Agricultural Commodities
65 Aluminum Processing
651 Aluminum, Magnesium Powder

Continued on back cover

PERFORMANCE PROFILE OF

CONTINUOUS ELECTRONIC LEAK DETECTION

MALLORY COMPONENTS

DIVISION, EMHART INDUSTRIES, INC.

The understanding of the reliability of continuous electronic leak detection equipment has perhaps been misunderstood by legislators, regulators and users in as much as continuous leak detection is a relatively new concept. By way of background, the initial emphasis in the United States for continuous leak detection systems emulated from three different governmental agencies: the first being the United States Coast Guard which was concerned with detecting spills upon navigable waterways. Second was the National Oceanographic and Atmospheric Administration which wanted to detect maritime spills outside of the three mile limit. The third was the Environmental Protection Agency which was concerned with detecting visible spills on inland waterways. The attempt to establish reliable detectors for these applications has generally been considered a failure. Progress since these efforts of the mid 1970's has been substantial, once the effort for reliable detectors shifted from open water concerns to ground water protection.

As a result of the unsuccessful attempts mentioned above, the

Mallory Components Division of Emhart Industries, Inc. began a feasibility study regarding the development of underground leak detection systems. At that time (1978), very little was known about the migration of underground toxic substances. However, through extensive testing, through inputs from various governmental agencies and by dealing with independent hydrologists and geologists, it was established that underground leaks could be reliably detected with properly configured equipment. Mallory tests in this regard substantiated this opinion. Accordingly, a major effort was launched to meet the needs of this industry. It is important to note that the input to the design of Mallory's leak detection came from the eventual users, i.e., major oil companies, chemical manufacturers and industrial corporations.

Since this effort has been launched, there have been literally thousands of successful installations made throughout the United States to a very broad cross-section of customers. In total, this company has now logged over 10 million hours of in-place operation for its leak detection equipment. This is equivalent to more than 1100 years of experience. In fairness, it must be mentioned that at the onset of this effort there were certain deficiencies of product design which immediately became apparent. However, in every case these problems were dealt with quickly and correctly and are remedied within all present designs. Perhaps the best indication of these product improvements generates from the fact that most of our customers continue to purchase our product on a routine and repetitive basis.

It is this corporation's policy to maintain continuing testing operations on all of its products in actual in-field conditions. Combining the total of in-field experience with company testing yields a failure mode of less than 1/10th of 1% of all products manufactured and installed. Installations of a more recent nature over the last year have exhibited a failure mode of less than 1/10th of 1%. While Mallory cannot speak for other manufacturers of leak detection equipment, it is important to point out that Mallory and its affiliated companies have been involved in the electronics business for over 60 years, manufacturing products which manifest themselves in everything from radios to space shuttles, from automobiles to weapons systems and from computers to telecommunications sytems. Accordingly, we are well experienced and understand what creates electrical and electronic failures and this expertise has made Mallory a recognized world leader in its product designs.

Most instrumentation suffers from what is known as "infant mortality" which means that if the product is going to fail, in most cases it will fail early in its life cycle. Again, speaking only for this company, it should be pointed out that every piece of instrumentation shipped has been tested under operating conditions for a minimum of 100 hours, thus weeding out the early failures which might occur. These tests are conducted in concert with required incoming, in-process and other quality assurance checks which are conducted on a routine basis. In addition, all products are manufactured under controlled conditions to prevent static sensitive electronic devices from becoming damaged by electrostatic discharge.

Of perhaps even more importance is the fact that this equipment has successfully detected leaks from underground storage facilities at a wide variety of facilities including oil companies, airports, trucking terminals, service stations, semiconductor houses, public utilities and the like. It should be pointed out that we would not always be informed of a leak in that this is not the type of information that most people are willing to broadcast. However, throughout all of the millions of hours of in-field operation, we have never been informed that our equipment has ever failed to detect a leak or spill.

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PUBLIC POLICY ADVOCATES

FREDERICK J. TAUGHER

1100 11th Street, Suite 311
Sacramento, California 95814
Telephone 916 441 0702

January 18, 1985

Ms. Carole A. Onorato
Chair
State Water Resources Control Board
901 P Street
Sacramento, CA 95814

Dear Madam Chair:

On behalf of two environmental protection companies, Hunter Environmental Services, Inc., and Mallory Capacitor Company, I wish to raise several objections to the most recent (January 3rd) revisions of the proposed regulations (Subchapter 16 of Chapter 3, Title 23, California Administrative Code), relating to underground storage of hazardous substances, which are now before the Board for consideration.

Our concerns are twofold: first, these regulations fail to match the wording and intent of AB 3781 and AB 1362.

Secondly, by omitting "continuous electronic monitoring devices" and "precision testing," these regulations would force the use of costlier, less efficient technology to detect underground leaks from storage tanks.

Failure to match AB 3781 and AB 1362

The following illustrate the lack of conformity between AB 3781 and the newest regulations.

Definition

AB 3781 specifically calls for the use of "a continuous leak detection system with alarm...located in the space between shells (of the container)" for every underground storage tank installed after January 1, 1984. (Section 1 (a) (6)). Black's Law Dictionary defines "continuous" to be "uninterrupted, unbroken; not intermittent or occasional; so persistently repeated at short intervals as to constitute virtually an unbroken series. Connected, extended, or prolonged without cessation or interruption of sequence." (See also Sullivan v. John Hancock Mutual Life Ins. Co. of Boston, Mo. App. 110, S.W., 870, 877).

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Section 6 (4) (c) of AB 3781 defines "monitoring system," for the purpose of that subdivision to mean "a continuous leak detection and alarm system which is located in monitoring wells adjacent to an underground storage tank and which is approved by the Board."

Note, however, that the latest proposed regulations define "continuous monitoring" to mean "a system using automatic equipment which routinely performs the required monitoring on a periodic or cyclic basis throughout the day." (Section 2621). The terms "periodic," "cyclic," and "routinely" do not mean "continuous," as defined in AB 3781 or in a standard legal text. The regulations should be brought into conformance with both the legal intent of AB 3781, and the legal definition of "continuous."

Article 2. Section 2621 (P.2.3)

The definition of double walled tanks does not conform to AB 3781, which changes Section 25291, Subdivision (a), Paragraph (b) of the Health & Safety Code.

Article 3. Section 2631, Subdivision (p) (p.3.10)

The definition in AB 3781 does not allow for sticking of the annular space, only for a continuous leak detection and alarm system.

Article 3. Section 2632 (p.3.15)

Omits the use of continuous monitoring systems. Sections 1(6) and 2(6) of AB 3781 relating to underground storage tanks installed after January 1, 1984, and Sections 3(6) and 4(6) dealing with underground storage tanks installed on or before January 1, 1984, all refer to and allow "a continuous leak detection and alarm system which is located in monitoring wells adjacent to an underground storage tank and which is approved by the local agency."

Table 3.1 (p.3.17)

Defines a "hazardous substance sensor" to "include either qualitative or quantitative determinations of the presence of the hazardous substance."

Qualitative or quantitative are not defined. Do they include continuous electronic monitoring systems, as required by AB 3781?

Article 3. Section 2634, Subdivision (b), Paragraph (7) (P.3.42, 3.43

Specifies only two possible methods for monitoring of the annular space of the double walled tanks: pressure or vacuum testing. Under AB 3781 it must be monitored with a continuous leak detection system with alarms. Also, there is no reference to precision testing.

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Article 3. Section 2634(d)(1) (p.3.30)

Does not mention the use of continuous electronic monitoring systems. AB 3781 specifically mentions the use of "a continuous leak detection and alarm system which is located in monitoring wells adjacent to an underground storage tank and which is approved by the local agency." (Section 3(a)(3)).

Article ~~3~~ 4. Section 2641(8)(d)(2) (p.4.26)

Permits local agencies who evaluate each monitoring alternative proposed, to utilize "a monitoring method other than ground water monitoring...on a monthly or more frequent basis for leak detection monitoring."

Continuous leak detection and alarm systems are omitted from the wording of this section. Art 4

Article ~~3~~ 4. Section 2646(b) (p.4.59)

Does not mention continuous leak detection and alarm systems, although both vapor monitoring and soil pore liquid monitoring are mentioned.

Article 6. Section 2663 (p.6.10)

AB 3781 (Section 25296, Sub.(c), Health & Safety Code), requires the Board to develop regulations requiring continuous leak detection and alarm systems which are located in monitoring wells adjacent to an underground storage tank after it has been repaired.

Policy Considerations

The Board should consider the following changes to the proposed regulations because they would be more efficient and workable:

Article 3. (General)

The criterion required are very specific and my preclude some acceptable technology. It is suggested that language be added to allow "other methods acceptable to the local agency."

Article 3. Section 2631, Subdivision (g) (P.3.10)

The language is too specific and may preclude another method of monitoring in the annular space which does not require drainage to a specific location.

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<u>Article 3. Section 2633, Subdivision (g) (p.3.26)</u>

It would be easier for those complying and enforcing the regulations if the language from AB 3781 were restated in the regulations. With respect to piping systems, add Section 25292, Subdivision (b), Paragraph (4):

"(C) If a pressurized pump system is connected to the tank system, the system has a leak detection device to monitor for leaks in the piping."

<u>Article 3. Section 2634, Subdivision (a) (P.3.27)</u>

It would be advantageous to include Section 25292, Subdivision (b), to the regulations:

"(4) For monitoring tanks containing motor vehicle fuels, daily gauging and inventory reconciliation by the operator, if all of the following requirements are met:

(A) Inventory records are kept on file for one year and are reviewed quarterly.

(B) The tank is tested, using the precision test as defined by the National Fire Protection Association Pamphlet 329, "Recommended Practice for Handling Underground Leakage of Flammable and Combustible Solids," as amended, for proving the integrity of an underground storage tank at time intervals specified by the Board and whenever there is a shortage greater than the amount which the Board shall specify by regulation."

<u>Article 4. Subdivision (c), Paragraph (1) (p.4.8)</u>

Testing on a <u>monthly</u> basis would be cost prohibitive. A testing <u>and</u> monitoring alternative is more effective.

<u>Article 4, Subdivision (c), Paragraph (6)(A) (p.4.18)</u>

This monitoring alternative is allowed for motor vehicle fuel tanks only; however, there is no language to indicate that except in Table 4.1.

<u>Article 4. Section 2643, Subdivision (b) (p.4.34)</u>

Reference to the NFPA 329 Precision Test (as indicated in AB 3781 is advisable. As found in the specific language of NFPA 329, Chapter 4, Page 27:

"4-3.10.1 Precision Test...means any test that takes into consideration the temperature coefficient of expansion of the product being tested as related to

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any temperature change during the test, and is capable of detecting a loss of 0.05 gallons (190 ml) per hour.

4-3.10.2 A test should be used which is chosen from currently available technology to reasonably determine whether or not an underground liquid storage and handling system is leaking. Any testing device used for the Precision Test must be capable of detecting leaks as small as 0.05 gal (190 ml) in one hour, adjusted for variables, a limiting criterion widely accepted by most authorities.

4-3.10.3 The test procedure should measure the amount of liquid lost based upon fundamentally sound principles. It should detect a leak anywhere in the complete underground storage and handling equipment. If the net change exceeds 0.05 gal (190 ml) per hour or equivalent criterion established for the technology employed, a leak is likely to exist, and appropriate corrective action is necessary.

4-3.10.4 The Precision Test should account for all the variables which will affect the determination of the leak rate. An understanding of what these variables are and how they are handles is essential to effective performance of the test. Following is a discussion of some of those variables and how they affect the measurement."

Article 4. Sections 2646 and 2647 (p.4.58)

As previously stated, new law specifies the alternative monitoring method of a continuous leak detection and alarm system which is located in monitoring wells adjacent to an underground storage tank and which is approved by the local agency.

The regulations should include a separate section which describes the criteria for continuous leak detection and alarm systems.

Continuous leak detection would be used in lieu of vadose zone monitoring and/or groundwater monitoring, and there are no limitations on the depth of groundwater.

Advantages of the Changes

Adoption of these suggested changes includes:

1. Reduced cost: Precision testing on a monthly basis is costly ($600 per tank). Continuous electronic monitoring is cost beneficial, because it reduces record keeping, does not require expensive lab analysis, and is easy to enforce.

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2. Better detection: With periodic detection methods, leaks might be missed.

3. Better reliability: Over 1100 years of extensive testing reveal a failure rate of continuous electronic monitoring devices of 1/10th of one percent. Precision testing is the only way to determine a tank's structural integrity.

We urge the Board to bring these regulations into conformity with AB 3781, for both statutory and economic reasons.

Sincerely,

Frederick J. Taugher

cc: Warren D. Noteware, Vice-Chair, SWRCB
Edwin H. Finster, Member, SWRCB
Darlene Ruiz, Member, SWRCB
Kenneth W. Willis, Member, SWRCB

#79 Richards

WESTERN UNION TELEGRAM
(Received 4:02 p.m.
October 22, 1984 over
the telephone)

Original being sent

TO: State Water Resources Control Board

We are opposed to the proposed Title 23, Chapter 3,
Subchapter 16 Regulations on Underground Tank Storage.

VAN GAS
Oakhurst, California

Distribution: Board Members
Bill Attwater
Walt Pettit
Ed Anton
John Richards

Received 10-23-84 #80A
mm

MADERA COUNTY

BOARD OF SUPERVISORS

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District 5

MADERA COUNTY GOVERNMENT CENTER
• 209 WEST YOSEMITE AVENUE
• MADERA, CALIFORNIA 93637
• (209) 675-7700

WANDA BRADLEY
Clerk of the Board

October 16, 1984

Water Resources Control Board
901 "P" Street
P.O. Box 100
Sacramento, California 95801

Re: Regulations for Underground Tank Storage of Hazardous Material.

Gentlemen:

Review of the proposed Title 23, Chapter 3, Subchapter 16 (CAC) regulations has generated serious concern among the Madera County Board of Supervisors.

We resent and have consistently opposed imposition of State-mandated programs without provision for State funding and, while we recognize that the proposed regulations are responsive to statutory requirements, we believe that the impact of compliance will be disastrous to many small businesses and grievous to neighborhoods, communities, and local government. Based on your estimated cost for compliance monitoring, service station operators in Madera County estimate that 50-70% cannot remain in business.

The extent of monitoring and surveillance required imposes a complex and difficult burden on local agencies but allows little leeway in implementation. Local agencies need the flexibility to designate appropriate numbers and types of monitoring facilities and to exercise discrimination in the frequency of sampling required.

We recognize that serious contamination of ground water has occurred in some areas and strongly support reasonable programs to protect these resources. The sheer magnitude of the proposed program, however, with the extraordinary number of borings and drillings required seems, of itself, to present a serious potential hazard. In some instances, regulations designed to protect environmental quality can create environmentally unsound conditions. This appears to be one of those instances.

We recommend reevaluation of the proposed regulations with the specific objective of:

1. Reducing the number of borings and wells, and

2. Providing evaluation of the advantages/disadvantages of various measures and techniques for monitoring, and

3. Providing greater flexibility to local agencies for decisions as to which measures and/or techniques to implement.

Additionally, we recommend that your Board support legislation during the next session to:

1. Abolish the requirement for local government to collect the surcharge, and

2. Provide consistent concern for all potential contamination sources and provide realistic requirements for tanks exempted by current law.

Yours truly,

Gail Hanhart McIntyre

GAIL HANHART MC INTYRE
Chair

#80B HS

MADERA COUNTY

ENVIRONMENTAL HEALTH DEPARTMENT

DAVID W. FISHEL, R.S., M.P.H., Director

• 135 WEST YOSEMITE AVENUE
• MADERA, CALIFORNIA 93637
• (209) 675-7823

October 17, 1984

Water Resources Control Board
P.O. Box 100
Sacramento, California 95801

Attention: Harold Singer, Technical Services Division

RE: UNDERGROUND STORAGE OF HAZARDOUS SUBSTANCES

The proposed Title 23, Chapter 3, Subchapter 16 (CAC) regulations have been reviewed and the following comments are submitted for your consideration:

1. Testing and certification of tanks and appurtenant piping is a critical component of the program and heavy reliance is placed on test results. Individuals certifying test results should be demonstrated to be qualified for the type of test they perform and report. Establishment of a Tank Tester Certification Program is recommended.

2. Vadose monitoring requirements should permit the option to choose between continuous sensors and testing at periodic intervals at local agency discretion.

3. The proposed regulations address the number and location of monitoring sites and frequency of sampling in great detail but do not address the quality of underlying groundwater. Each of these parameters should allow maximum flexibility for the local agency to designate appropriate requirements.

4. Monitoring requirements contain many redundancies presumably to assure with certainty that no undetected contamination can occur. There are no inexpensive activities in connection with this program; consequently, redundancies must be evaluated in terms of cost/benefits. The additional level of protection afforded by excessive monitoring requirements appears to be very costly without offering commensurate benefits. The local agency should have sufficient freedom of action, after evaluation of an installation, to require soil sampling, leak detection, vadose monitoring, or groundwater assurance monitoring, or any combination of these, as appropriate, but should not be bound to impose all of them.

5. Despite the prescribed security precautions of locked caps on monitoring wells and surface security structures, the remarkable number of groundwater monitoring wells poses a severe threat to groundwater simply by virture of their numbers. Each monitoring well is a conduit from the surface directly to the area of concern and presents an uninhibited opportunity to contaminate, whether by accident or intent. The number of groundwater monitoring wells should be kept to a minimum and required only in instances where there is good reason to believe that contamination already has occurred.

6. There is an inherent credibility problem in the proposed requirement for full scale vadose monitoring if any portion of a tank is inaccessible to visual examination while tanks which are less than 50% underground are exempt from any regulatory requirements.

7. Strict inventory controls with attendant audits are capable of providing accurate surveillance information in many instances. The local agency should have the opportunity to designate this alternative in lieu of more stringent monitoring.

8. Although the responsibility rests with the Legislature rather than the WRCB, the credibility problem mentioned in item 6 is exacerbated by the apparent absence of concern with certain likely areas of potential contamination, as exhibited by legislative exemption. Also, the requirement for local government to collect a surcharge on tank permits for the State imposes a workload without providing reimbursement. Both of these matters should be addressed in the next legislative session and WRCB should develope proposed legislation, seek sponsors, and urge adoption of revision in these areas.

In short, there is strong support among government and industry for groundwater protection but the proposed regulations appear to have been developed to extreme limits with insufficient concern for economic feasibility or impact.

Thank you for the opportunity to comment.

Yours very truly,

D. W. Fishel
Director, Environmental Health

DWF/eh

80-C

MADERA COUNTY

ENVIRONMENTAL HEALTH DEPARTMENT

DAVID W. FISHEL, R.S., M.P.H., Director

• 135 WEST YOSEMITE AVENUE
• MADERA, CALIFORNIA 93637
• (209) 675-7823

November 26, 1984

Water Resources Control Board
1416 9th Street
Sacramento, California 95814

RE: PROPOSED UNDERGROUND TANK REGULATIONS

The revised proposal has been reviewed and appears to offer only slight improvement over previous drafts. Revisions seem to be more form than substance.

In view of the extensive rewriting since 23 October and the complex internal cross-referencing of the document, it is not surprising that some editorial and typographical errors remain. None of these appear to be sufficiently serious to prohibit understanding their intent however, so they will not be specified. Duplication of Section 2642 is in this category.

Some items which should be addressed specifically, however, are:

1. **Section 2611(a)(1):** Exemption of tanks located in jurisdictions with ordinances adopted prior to January 1, 1984 is reasonable and conforms to statute Imposition of requirements beyond those established by Health & Safety Code, however, is ill-usage of authority and misapplication of good intentions.

2. **Section 2635(b)(9)(b):** Poorly worded. Does this impose a requirement that the receiving tank be determined to have immediately available either 103 percent or 100 percent plus 200 gallons of the total volume of the tank from which delivery is being made? Or does it establish a requirement for either 103 percent of the volume of the delivery tank or 200 gallons, whichever is less? It is presumed that most deliveries will be from tanks considerably larger than 200 gallons; therefore, requiring a 200 gallon minimum receiving volume is not realistic.

3. **Sections 2641(b) and 2641(d):** These sections impose a requirement for ground water monitoring of all ground water that is less than 100 feet deep. Alternatives

listed in Table 4.1 fail to indicate this requirement and many owners and operators are relying almost entirely on Table 4.1 to understand the regulatory requirements. Absence of a straightforward statement constitutes a misleading situation.

4. **Table 4.1, Monitoring Alternatives:** A statement should be included noting that every installation will require groundwater monitoring if groundwater is less than 100 feet, or Sections 2641(b) and (d) [2, above] should be revised.

5. **Table 4.2:** Column headings should be placed directly over appropriate columns to avoid confusion. Placement of the word "Error" is inappropriate.

6. **Section 2641(c)(7)(b)(ii):** As stated, the tanks being measured cannot be used. Apparently, tanks must be measured at intervals of at least 5 days during which input or withdrawls is prohibited. The reference to consecutive periods implies a continual process which would, in effect, prevent utilization of the tank.

7. **Section 2648(p):** Who is to review "...water level measurements on record for wells within 5 miles..." and which records are to be reviewed? Is each applicant to review all wells within almost 80 square miles? This section imposes an unrealistic requirement which presumably is to be accepted as an alternative to previous unrealistic drilling requirements. It should be deleted.

8. **Section 2651(a)(7):** If estimated cleanup costs are in fact voluntary submissions, the paragraph should be revised. If the intent is to <u>require</u> submission, the section should be deleted.

9. **Section 2652(b):** Releases should be reported to the local agency which may involve the Office of Emergency Services and the Regional Board if appropriate. Program implementation and requlation will be sufficiently complex and difficult without imposing additional and potentially conflicting requirements.

10. **Section 2652(d):** Revise first sentence to read: "Until clean-up is complete, the operator or permittee shall submit reports every 3 months or at a more frequent interval specified by the local agency." Impact of problems will be felt most severely at the local level and must be dealt with by local agencies. State and regional

offices may serve appropriately in technical support and liaison roles to local officals. State and regional agencies do not have appropriate roles in direct service or enforcement, but should support and assist local efforts.

Revision of your proposal as recommended above will provide protection of groundwater, sufficient monitoring of potential sources of contamination, and provide a candid statement of regulations. The proposal still would, however, be far more extensive and expensive than necessary. The regulations are no doubt well-intentioned but the approach consistently has been immoderate and continues to impose excessively stringent requirements in many areas, including establishing a Regional Board role in program implementation.

Your serious reconsideration is strongly requested.

Yours truly,

David W. Fishel
Director, Environmental Health

DWF/eh

Original Comments 81-90

Index to Rulemaking File Underground Storage Tank Regulations Title 23, Waters Division 3, Water Resources Control Board Chapter 16, Underground Storage Tank Regulations **1985**

HS

#81

THE GREYHOUND CORPORATION

Greyhound Tower
Phoenix, Arizona 85077
(602) 248-4000

October 19, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
P. O. Box 100
Sacramento, California 95801

Dear Mr. Singer:

RE: Proposed Underground Storage Tank Regulations

Enclosed for your consideration are our comments on the proposed rulemaking. If you have any questions, please contact me at (602) 248-5060.

Sincerely yours,

Hal Rosoff

H. D. Rosoff
Director
Environment and Energy

HDR:kp
enclosure

Received DTS

OCT 22 1984

THE GREYHOUND CORPORATION

Greyhound Tower
Phoenix, Arizona 85077
(602) 248-4000

Comments by

The Greyhound Corporation

in the matter of

State of California Proposed Regulations Governing Underground Storage of Hazardous Substances

Subchapter 16 of Chapter 3, Title 23, California Administrative Code (23 CAC Section 2610-2704)

October 23, 1984

Greyhound Lines, Inc., a national intercity bus company, owns and operates 10 facilities in California having 33 registered storage containers directly affected by the proposed rule. Aircraft Service International, Inc., another subsidiary of The Greyhound Corporation, owns and operates the registered Jet A underground fuel hydrant system serving San Francisco International Airport, which we believe is also affected by this rule.

Greyhound has actively participated in similar proposed rulemakings in other states, especially Florida, where final rules have already been established. Greyhound fully supports the intent of this state rulemaking to better control the unintentional discharges of stored fuel and hazardous chemicals into the environment. Greyhound offers the following comments in the hope that they will be considered as improvements to the proposed rule to make it more practical and, therefore, more likely to be successful in its implementation.

Discriminatory Application Depending on Ownership

The state law behind this proposed rule seeks to protect the waters of the state from pollution by any stored hazardous substances, regardless of who the owner may be. Stored products for agricultural use or petroleum transmission can seriously pollute large water sources. However, the proposed rule, instead, quite arbitrarily exempts these classes of storers of hazardous products. No defense of this discriminatory application is provided in the rule or accompanying documents. The recent federal legislation reauthorizing RCRA closed a major loophole in prior legislation which had exempted small quantity hazardous waste generators. The lesson learned is directly applicable to this rule, too.

In the interest of seeking broader control and in seeking fairness, all storage containers of hazardous substances should be covered by this rule regardless of whether it is by agriculture, petroleum, or other business.

Economic Impact On Existing Systems

The State Board already concedes the proposed rule, "will have a **significant** economic impact on private persons and businesses," and "may have a **significant adverse** economic impact on small businesses" (emphasis added). Within Greyhound, the local unit of each operating subsidiary is a stand-alone profit center that must alone carry its own direct costs for operation. Therefore, Greyhound is in an identical position to that of any other small business because, at any one facility, the financial resources to comply with the proposed rule will be extremely limited. While we understand the desire of the state to acquire a thorough and rapid insight into underground and groundwater conditions at every existing underground tank, such knowledge is well known to be extremely costly to obtain and, in most cases, will only confirm negative and unproductive results. For the State of California to saddle its industries with a new economic burden of such questionable net value appears to be largely a waste of resources.

Instead, we recommend the state abandon its proposal to achieve rapid and extensive intelligence about all underground conditions at all existing sites regardless of cost and, instead, implement a phased investigation that first requires only absolutely minimal ground investigations at existing facilities followed later by additional monitoring burdens when any problem at any site is suspected. If this phased approach is adopted, the people of the State of California will be better served by a rule more likely to be implemented on a timely basis with less economic impact to them, yet one still likely to achieve the same net results in protection.

Eliminate or Modify Sections 2644, 2645, and 2646

Specifically, we recommend eliminating Section 2644 which calls for onerous soil testing and slant boring. Where further testing is found necessary after initial testing confirms a problem, then properly located vertical boring is more cost effective and, therefore, slant boring should be eliminated as a mandatory method to obtain desired information.

We further recommend eliminating Section 2645 which requires Vadose Zone detection monitoring. We understand such techniques are not yet proven for such widespread field use. If retained, the rule should be less ambiguous so that only gasoline and other highly volatile products are covered as opposed to less volatile products like Jet A and Diesel oil.

Section 2646 should be scaled down in scope to initially require as few as one monitoring well as an initial test of site conditions, with greater latitude to owners to design the well or wells to find out the conditions at existing sites. For example, for all storage of hydrocarbons, a simply constructed single observation well to visually detect product on the groundwater surface in a well adjacent to the tanks would be a practical initial assessment of existing conditions at most sites. The rule should provide flexibility for this lower cost practical approach in facilities where applicable.

Inventory Variances

The proposed rule arbitrarily selects 50 gallons as a variance large enough to force reevaluation of inventory data. This figure is unrealistic for large systems. Some very large fueling systems have normal daily variances of up to 5,000 gallons which are insufficient to require special investigation in those systems. We recommend California consider the approach the State of Florida finally adopted after considering five proposed versions on how to write the inventory control section. Florida's adopted version was the only one to apply effectively to both small and extremely large inventories.

H. Rosoff

H. D. Rosoff
Director, Environment and Energy
The Greyhound Corporation
Greyhound Tower
Phoenix, Arizona 85077

#82 H-S

UPDIKE, KELLY & SPELLACY, P. C.

COUNSELORS AT LAW

ONE STATE STREET
POST OFFICE BOX 31277
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CABLE "UKSLAW"
TELEX 643067 HQ HFD

(203) 548-2600

DIRECT DIAL NUMBER
(203) 548-2613

October 19, 1984

State Water Resources Control Board
P.O. Box 100
Sacramento, California 95801

Attention: Harold Singer
Division of Technical Services

Re: Proposed Regulations for Underground Storage Tanks
Comments

Dear Mr. Singer:

As you know, we have been working with Veeder-Root, a subsidiary of Western Pacific Industries, in bringing its Tank Level Sensor (TLS) continuous inventory monitor and leak detection device to the attention of various regulatory bodies, including your Board. Below are our specific comments with respect to your draft regulations as well as additional information regarding the Veeder-Root TLS. Assuming it can not be expressly or generically referred to in these draft regulations, we certainly believe the TLS satisfies the intent of these regulations in a number of respects. As required by Article 8, the TLS is an alternative to a number of other devices or mechanisms specified, which, in an appropriate setting, will "adequately protect the soil and the beneficial uses of water of the state from an unauthorized release".

Veeder-Root has recently developed the TLS-250 Tank Level Sensor, which continuously measures the fuel levels in all underground fuel tanks of a service station. It displays and can print out

Received DTS
OCT 22 1984

these levels, as well as the volumes and temperatures of fuel and the levels of water at the bottoms of the tanks. The Leak Detect mode can be activitated for all tanks or a single tank in several ways: automatically at pre-set times, by pushing a button, or by a computer over a telephone line. When the TLS-250 enters the Leak Detect mode, it precisely measures the fuel level in each tank selected for monitoring and stores the values. Each hour after the start of the Leak Detect mode, the TLS-250 again precisely measures the levels, corrects for any changes due to temperature, determines the changes in levels from the start of the test, converts these changes to volumes, and then stores and prints the results. Leak rates down to 0.25 gallons per hour can be detected in this manner.

Standard tank testing is generally performed only, at most, once per year. (Under the proposed regulations, for many tanks even this testing would be either nonexistent or even less frequent than once a year.) It is not possible to detect a leak in between tests, if tank testing alone is being relied upon for leak detection. As contrasted with static tank testing, with the TLS, tanks can be checked daily or as desired. Significantly, a printed record which includes time, date, and station name and address can be generated. If and when a tank leak should start, it can be detected quickly, before any significant environmental damage can occur.

By precisely monitoring the fuel level in a tank during those times when no fuel is being dispensed, the TLS-250 can detect leaks shortly after they start. Thus, the intent behind the TLS-250 is not to determine absolutely at a single point that a tank is not leaking (as is the approach where standard tank testing is employed), but rather to "stand guard" continuously so that, if a leak does start, it will be quickly detected.

The cost of the TLS-250 system for a three-tank station is less than $4700. As we discussed previously, besides monitoring tanks for leaks, the TLS-250 generates accurate inventory records of fuel in the tanks and reflects quantities delivered. In addition, it contains alarms for potential overfills of the tanks during deliveries and for thefts of fuel when the station is closed. The standards of protection, accuracy and convenience afforded by the TLS-250 have not heretofore been available in any other similar equipment.

Veeder-Root strongly believes its TLS can be of tremendous assistance to the state and, of course, owners and operators of stations having underground fuel storage tanks. Since the TLS can meet the intent of the draft regulations and the enabling legislation, Veeder-Root has examined closely those provisions relating to local or regional authority and also application for variances. Since Veeder-Root, as neither an owner or operator of an underground fuel storage tank, would nonetheless be interested in seeking a variance, either categorical or site-specific, we are very concerned about the present proposed language of Article 8, Sections 2681(a) and 2682(a), which states application must be made by "the permittee". Since other statutory and regulatory language would still bring operators and owners before a regulatory body for a permit, Veeder-Root submits a much broader group should be afforded the opportunity to make application for a variance, especially a categorical variance. The language of the above-referenced sections should be changed accordingly.

In reviewing the draft regulations, Veeder-Root also noted a lack of clarity regarding the testing requirements of Article 3, Section 2634(a)(3) and Article 4, Section 2642 (d). While Article 3 relates to new tanks and requires hydrostatic testing every two years, Article 4, for example, requires "no testing" of existing tanks installed and monitored in accordance with Article 3. It is unclear whether the Article 4 tanks do or do not necessitate tank testing.

Veeder-Root further suggests Article 4, Section 2642(h), requires clarification to avoid any appearance of inconsistency with Article 3, Section 2634(a)(4). The latter requires an on-line pressure loss detector connected to a visual or audible alarm system unless there is provision for at least a 50 percent reduction from normal flow rate. Presumably, Article 4, Section 2642(h), requiring both detector connection to a visual or audible alarm and flow reduction to no more than 50 percent under normal operations, refers to situations involving pressurized tanks, i.e. not gasoline tanks.

We hope the above comments on the draft regulations will be of benefit to the Board. Veeder-Root looks forward to working with California's state, regional and local regulatory bodies toward implementation of its Tank Level Sensor device.

Respectfully submitted,

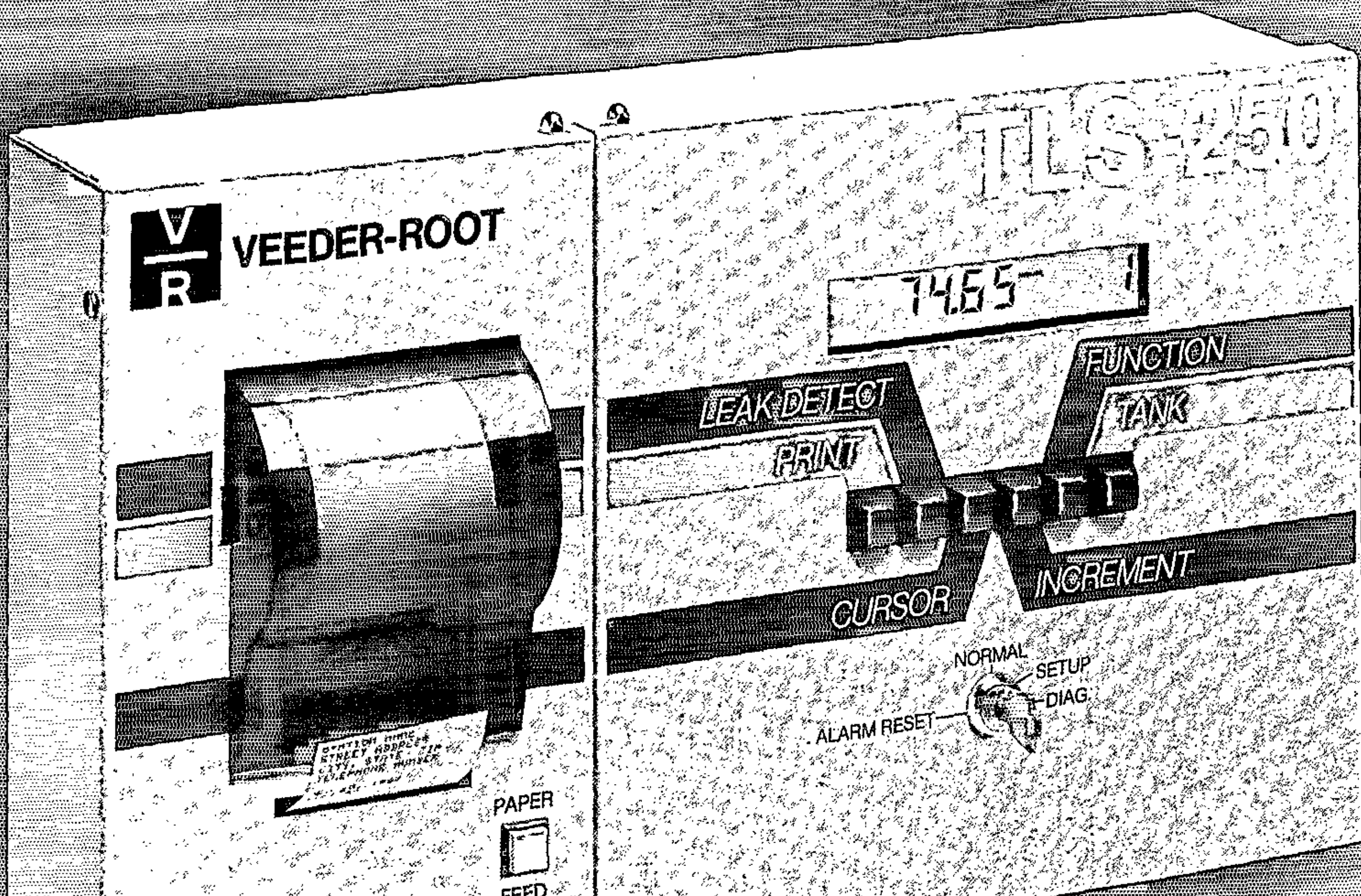
Elizabeth Collins Barton

ELIZABETH COLLINS BARTON
on behalf of Veeder-Root

Enclosure

From Veeder-Root

NEW! TLS-250 TANK LEVEL SENSOR



Measures fuel inven accurately and auto tests tanks on dema

Loaded with features to improve management control

- **On-Demand Inventory Report**
  - *Gallons of Fuel*
  - *Inches of Fuel*
  - *Inches of Water*
  - *Temperature*
- **Automatic Delivery Report**
- **Leak Detect Reports**
- **Automatic Leak Alert**
- **Overfill Alarm**
- **Programmable alarms for**
  - *Sudden Loss*
  - *Low Inventory*
  - *High Water*
- **Single-tank leak detect capability**
- **Programmable automatic report times**
- **One system monitors up to 8 tanks**
- **New two-wire, factory-calibrated "smart" probes**
- **On-site & remote diagnostics**
- **Available with or without integral printer**
- **Handles manifolded tanks**
- **RS-232 interface**
- **Only need to specify tank diameters to order system**

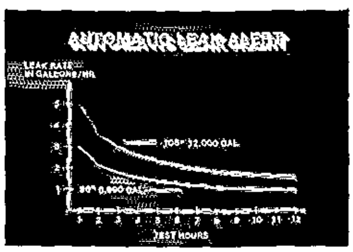
Tightens inventory control

TLS-250 tightens inventory control by continuously monitoring the fuel in your underground tanks. It provides detailed reports on fuel volume and height, temperature, water level, and the time and date at the touch of a button.

This information, acquired automatically, can be used to speed shift changes by eliminating tank sticking and manual report filing; to reduce inventory errors and spot losses caused by theft, leaks or meter miscalibration; and to provide a means for sound inventory practice. In addition, data may be processed to provide automatic station reconciliation.

Improves fuel security, identify possible leaks

TLS-250 features reports and alarms that add extra security to your station. Reports that confirm bulk delivery amounts automatically. A programmable high-level alarm to warn of overfill during bulk deliveries. And programmable low-fuel inventory and high water limit alarms. Plus, a sudden-loss alarm to detect rapid inventory changes caused by theft or a major tank failure during closed hours.



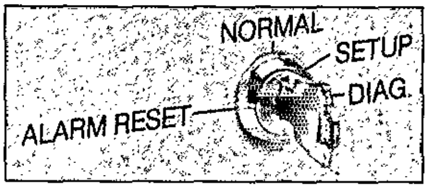
TLS-250 also has an automatic leak alarm which is set to identify high leak rates which could cause major problems.

The automatic leak alert feature is factory programmed to call attention to large losses. While the TLS is in the leak detect mode, if the system detects a loss of product which is in excess of the amount shown by the diagram the leak alarm is triggered. The alarm causes the display to flash on and off for the particular tank involved, and the detected leak rate is displayed. The time and date in addition to the tank and leak rate are automatically printed by the system. The automatic leak alert can only be reset by using the system key switch.

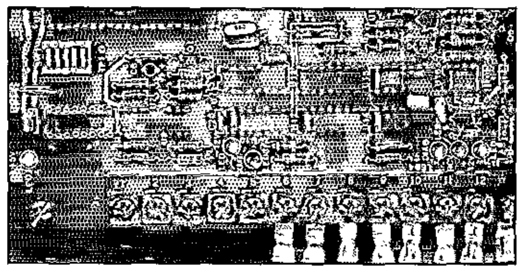
tory
matically....
nd!

A TLS-250 probe *is mounted permanently in each tank through either a 3" or 4" riser pipe. It operates on a capacitance principle to sense fuel height, and requires only a simple two-wire connection to the console. Probes are available in various lengths to suit standard tank sizes.*

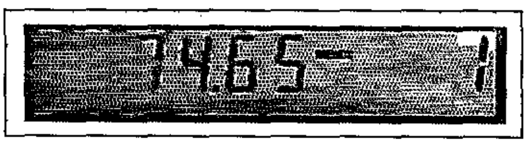
A thermistor sensor *measures fuel temperature to provide temperature-compensated inventory data—for use by the leak detect system.*



1 **By turning a key,** *you select a TLS operating mode . . . "Normal" to monitor inventory or detect leaks. "Setup" to enter or review system and tank parameters. "Diagnostics" to check hardware and software. "Alarm Reset" to reset an alarm indication.*



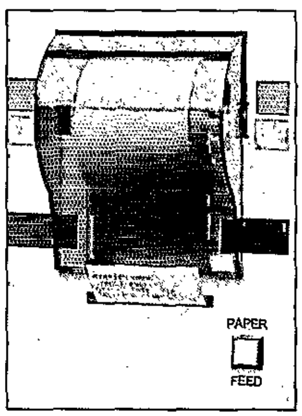
2 **Six hardware diagnostic LEDs** *mounted internally allow service people to check the system's status at a glance.*



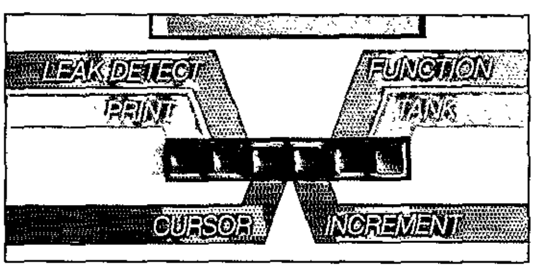
3 **An easy-to-read 6 digit LCD shows:**

- *time*
- *fuel and water height*
- *fuel volume*
- *fuel temperature*

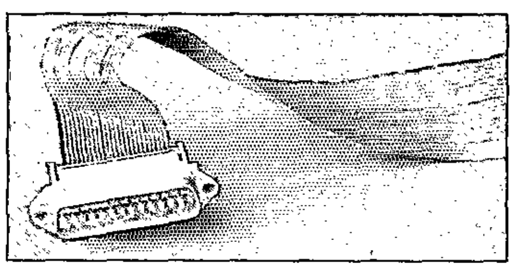
An electronic label identifies each display, selected by the function button.



4 **The 20 column TLS printer** *is simple to load, covered for paper protection. A variety of printed reports speed shift changes, document inventory, confirm deliveries, show setup parameters, and provide leak detection data.*



5 **Front-panel pushbuttons** *let you profile TLS-250 with tank and system parameters and revise them as you need. The buttons also provide the means to review all inventory information, tank-by-tank, and call for printed reports.*



6 **Through an RS-232 port,** *TLS-250 interfaces with sophisticated electronic point-of-sale terminals to form an integrated station management system. And it can communicate to a headquarters location via telecommunications networks for fast inventory reporting and automatic reconciliation of station totals.*

A three-stage filter *helps to ensure measurement accuracy in all fuel tanks by separating water from the product.*

FIELD-PROGRAMMABLE SET-UP PARAMETERS MATCH TLS-250 TO YOUR STATION REQUIREMENTS

TLS-250 can be field-profiled to match station operating and layout requirements. Tank setup parameters include product label, tank capacities at 1/4, 1/2, 3/4 and full levels, diameter, tilt and manifolding information. In addition, limits for high water, overfill, low inventory and theft can be entered for each tank.

System setup parameters let you set three automatic inventory printout times, set start and stop times for automatic leak detect, and establish an external interface security code to prevent tampering. A security key lock lets you select "normal" operation, "setup" to enter or change system and tank parameters, or "diagnostics" to check the system's hardware and software.

And TLS "Remembers" Your System Parameters. After initial profiling, your individual system setup remains in CMOS memory with battery backup. Tilt, volume, manifolded tanks, alarm limits, three automatic report print times, automatic leak detect start/stop times, print header, tank labels, security code, and tank configuration are permanently stored until you decide to change them.

SPECIFICATIONS

Performance specifications listed below represent values that could be expected from a TLS-250 system if a perfectly cylindrical, calibrated (10′ diameter, 10,000 gallon) tank was used.

Height of fuel	± 0.1″
Volume of fuel	± 15 gallons
Leak detect mode	± 0.1 gallon
Fuel temperature	± 1½°F
Time	± 1 minute/week

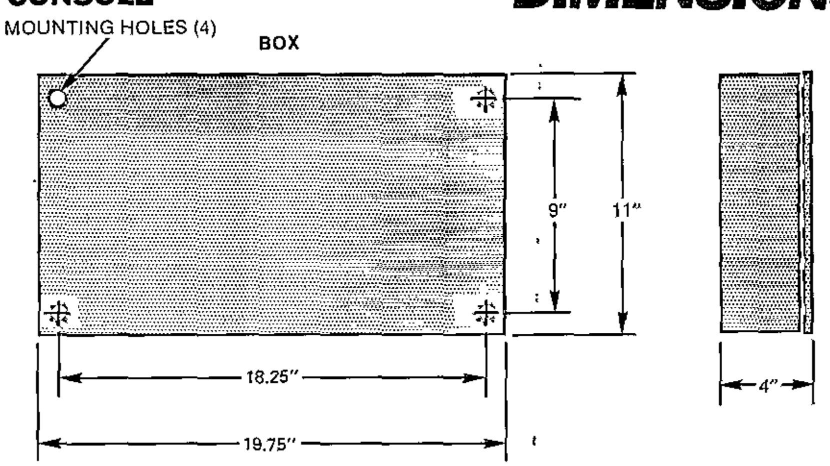
TO ORDER

When ordering a TLS-250 system, you need only to specify the probe length ("A" in dimension diagram below) and whether you desire the optional printer. See the TLS-250 price list for part numbers.

All other operating requirements are field-programmed and need not be specified at the time of purchase.

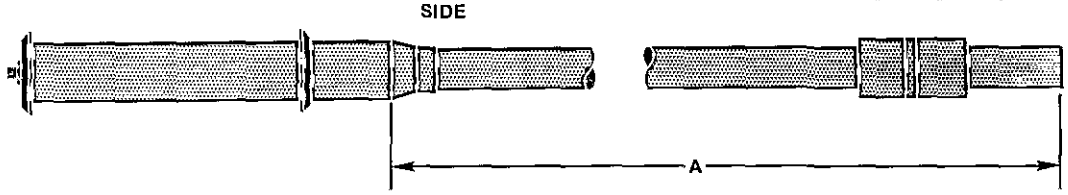
DIMENSIONS

CONSOLE



FRONT SIDE

A = LENGTH OF PROBE
7′6″ (2.28 m)
8′ (2.44 m)
9′ (2.74 m)
10′ (3.05 m)
10′6″ (3.20 m)
11′ (3.35 m)
12′ (3.66 m)



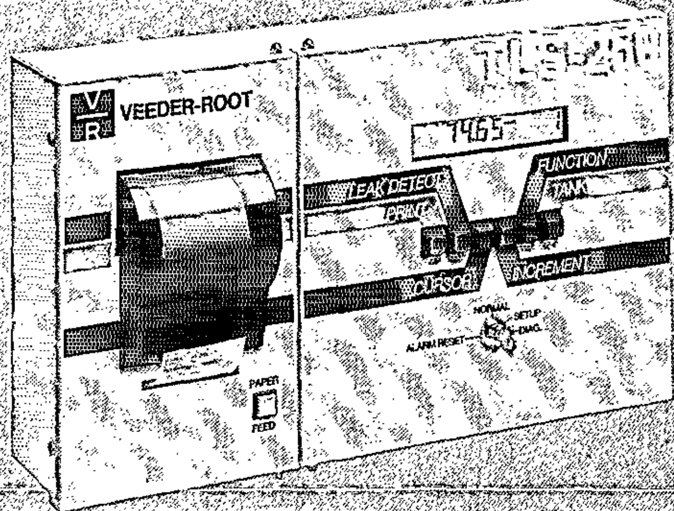
VEEDER-ROOT
A SUBSIDIARY OF WESTERN PACIFIC INDUSTRIES

PETROLEUM PRODUCTS

70 SARGEANT STREET, HARTFORD, CT 06102 (203) 527-7201

TLS-250

A STEP AHEAD IN INVENTORY MANAGEMENT AND ENVIRONMENTAL PROTECTION!



TLS Systems meet the needs of today's station management with automatic inventory information. And they look to the future by being *able to integrate with other devices* to form sophisticated management systems.

TLS can interface with electronic cash registers, point-of-sale *terminals, and/or data processing* systems to provide detailed information on fueling transactions and inventories.

Information from TLS can also be transmitted via existing telecommunications networks to central management headquarters. This is especially important for *multi-location* convenience store chains, oil jobbers, major oil companies and unattended fueling sites where the convenience of remote polling, *the speed of data collection and the* reliability of information is of great significance.

Using this information, you are able to analyze station operations, *plan fuel allocations* and set bulk delivery schedules with greater ease and efficiency.

LOSS DETECTION = ENVIRONMENTAL PROTECTION

TLS not only addresses the need for *tight inventory control for effective* station management, but also provides a means of meeting environmental concerns over underground leaks.

Unexplained inventory losses, even small ones, may be leaks that can cause severe environmental damage. Inventory control records from TLS are the first step in spotting them. Then you can switch immediately to "Leak Detect" for a closer look. If the test confirms your suspicions, you can take action fast!

TLS-250 is a permanently installed, continuous monitoring device for underground fuel storage tanks. Unlike one-time tank tests *that give you a status report on your* tanks for only the day of the test, TLS provides inventory information as well as leak detection year round and at your convenience. In addi*tion*, while you pay hundreds of dollars for a one-time test only to end up with a single report, the money spent on TLS is a capital investment adding value to your operation while returning much-used operating information on a continual basis.

IDEAL FOR RETAIL AND PRIVATE FUELING OPERATIONS

Automated, continuous monitoring of fuel stored underground and the ability to spot leaks quickly has become critically important because of the high cost of fuel inventories and the growing concern for environmental protection. This is true not only for traditional retail fuel dealers, but also for the increasing number of *private fueling operations* in commercial, corporate and government fleets. Typical users of TLS-250 would be:

- Major oil companies
- Oil jobbers
- Convenience stores dispensing fuel
- Commercial, private and government fleet operators
- Other operations such as railroads and airports where fuel may be stored in underground tanks

---

For complete information on TLS-250, contact your nearest Veeder-Root Distributor. Or call Veeder-Root at (203) 527-7201.

PRINTED REPORTS DOCUMENT INVENTORY STATUS, SPEED SHIFT CHANGES, IDENTIFY LOSSES!

Inventory Status Report provides detailed reports on fuel volume and height, temperature, water level, and the time and date at the touch of a button.

```
Station Name
Street Name
City, State, Zip
Telephone Number
NOV 10, 1984
6:30 AM
PREMIUM UNLEADED
  5487   GALLONS FUEL
 51.36   INCHES FUEL
   0.0   INCHES WATER
  55.3   DEGREES F
REGULAR UNLEADED
 14695   GALLONS FUEL
113.65   INCHES FUEL
```

Automatic Delivery confirms bulk delivery amounts adding extra security to your installation. And TLS-250 electronically stores the last 10 delivery reports for each tank.

```
PREMIUM UNLEADED
INVENTORY INCREASE
NOV 10, 1984
3:38 PM
   709 GALLONS FUEL
  56.7 DEGREES F
NOV 10, 1984
3:59 PM
  5685 GALLONS FUEL
  60.4 DEGREES F
  4976 NET INCREASE
```

Leak Detect Report helps to spot inventory losses early, even small ones not normally detected with a stick.

```
START LEAK MONITOR
Station Name
Street Address
City, State zip
Telephone Number
NOV 10,1984
11:00 PM
PREMIUM UNLEADED
   5487 GALLONS FUEL
  51.36 INCHES FUEL
    0.0 INCHES WATER
   55.3 DEGREES F
REGULAR UNLEADED
up to 8 tanks
TEST HOURS 1 - 6
--------------------
 TNK1 TNK2 TNK3 TNK4
     DEGREES F
55.2 59.0 53.5 60.1
      GALLONS
 0.0  0.0 -0.3  0.0
-0.1  0.0 -0.7  0.1
-0.1  0.0 -1.0  0.1
-0.1  0.1 -1.3  0.0
-0.2  0.0 -1.8  0.0
-0.2  0.0 -2.1  0.1
STOP LEAK MONITOR
NOV 11, 1984
6:30 AM
```

Theft Alarm detects and warns you of a rapid change in inventory.

```
THEFT ALARM
REGULAR UNLEADED
NOV 10, 1984
3:46 AM
```

Leak Alarm automatically alerts you to a major tank leak during closed hours.

```
LEAK ALARM
REGULAR UNLEADED
 -4.32 GALLONS/HOUR
DIESEL
  2.65 GALLONS/HOUR
```

Overfill Alarm warns you of a potential overfill during bulk deliveries.

```
---OVERFILL ALARM---
REGULAR UNLEADED
NOV 10,1984
3:46 AM
```

Low Limit Alarm can be set to a predetermined low fuel inventory.

```
---LOW LIMIT ALARM---
REGULAR UNLEADED
NOV 10, 1984
3:46 AM
```

High Water Alarm can be preset to the desired high water limit.

```
---HIGH WATER ALARM---
REGULAR UNLEADED
NOV 10, 1984
3:46 AM
```

Alarm History Report is an operational listing that includes the dates and times of the last three occurrences of each type of limit alarm for each tank.

#80 HS

10/23 Board-Members Received ccs
cc: SAB
John Richards
WGP
MAC

Assembly California Legislature

Assembly Committee on Agriculture

CHAIRMAN
NORMAN S. WATERS
ASSEMBLYMAN, SEVENTH DISTRICT

State Capitol
Sacramento, California 95814
(916) 445-1918

October 22, 1984

Warren Noteware
Water Resources Control Board
901 P Street
Sacramento, CA 95814

Dear Mr. Noteware:

The purpose of this letter is to state my understanding of the legislative intent of AB 1362 (Sher). For the following reasons, I believe AB 1362 does not apply to California's agricultural industry, including the production of food and fiber and all related activities.

When AB 1362 was presented by Assemblyman Sher on the Assembly Floor, I raised the question as to whether or not his bill would adversely impact agriculture. He responded by stating he was accepting an amendment exempting agriculture, which in his words, "would assure that my bill would not adversely impact the agricultural industry." Based on this assurance, I voted for the bill.

Had I known that AB 1362 would be interpreted to include only some segments of agriculture, I would have voted against the bill. This being the case, I request that agriculture, including cotton ginning, be deleted from your proposed regulations, or, in the alternative, that clarifying legislation be introduced and adopted prior to the implementation of any such regulations.

Received DIS
OCT 22 1984

Your favorable consideration of this request will be greatly appreciated. Please contact me if I can provide you with any additional information.

Sincerely,

Norm Waters

NORM WATERS
NW:plj

DEC 15 1984

#83-B

Assembly
California Legislature

December 10, 1984

Carole A. Onorato, Chairwoman
State Water Resources Control Board
901 P Street
Sacramento, CA 95814

Dear Carole:

I am aware that you and your Board have been wrestling with drawing up the regulations to implement AB 1362 governing underground storage tanks for several months.

Received DTS DEC 19 1984

I commend the Board for the thorough process and the opportunity you have allowed for public comment on this very sensitive and far-reaching regulatory program.

While we all understand the grave environmental consequences of leaking underground storage tanks, I think its equally important that we not lose sight of the small business people whose livelihoods are about to be impacted by these regulations.

Of particular concern to me is the potentially devastating effect on businesses with small tanks and relatively low volumes of gallonage put through those tanks on an annual basis. Its important, of course, that these operators institute conscientious business practices which will assure that the groundwater of the state is secured from potential hazard.

As I understand, most of the operations of this type can meet the stringent inventory reconciliation standards included in the November. 9 draft of the regulations. I feel AB 1362 contains sufficient latitude to allow the Board to reestablish a category specifically for tanks, perhaps those less that 2,000 gallons and with an annual volume of less than 20,000 gallons, to be monitored exclusively by inventory reconciliation and exempt from other monitoring requirements such as groundwater and vadose zone wells.

SACRAMENTO

Of equal concern to me is the possibility that small business may again be subject to the victimization of technological vendors, as we have seen in past, similar instances. Its important that some guidance be afforded small business to allow them to make cost-effective investments of useable procedures.

Realizing that you are facing the deadline constraints of AB 1362, I suggest that some arrangements can be made to allow you sufficient time to consider all the issues before you and to adopt a set of regulations which will best implement this legislation.

Thank you for considering the role of these small tank owners and for the effort and diligence shown by the Board in assessing the impact of these regulations.

Sincerely,

NORM WATERS
NSW:ls

#84 HS

CENTRAL VALLEY ROCK, SAND & GRAVEL ASSOCIATION, INC.

SAND-GRAVEL • CONCRETE • ASPHALT

October 19, 1984

Statement to:

State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801
Attn: Harold Singer
Division of Technical Services

Received DTS
OCT 22 1984

Subject:

Proposed Regulations Governing Underground Storage of Hazardous Substances

Members of the Central Valley Rock, Sand and Gravel Association welcome the opportunity to comment on the regulations proposed by the staff of the State Water Resources Control Board to implement legislation adopted in 1983 and 1984 governing the use of underground storage tanks.

The Central Valley Rock, Sand and Gravel Association represents numerous ready-mix/concrete suppliers, rock, sand and gravel excavation operations in the Central Valley region situated between Modesto and Bakersfield. Many of the excavation sites are located in remote sections of the region; a wide variety of non-highway equipped heavy machinery is used at all operations. The average operation turns over an inventory of about 7,500 gallons of motor vehicle fuel within 30 days. Due to the volume of fuel and its corresponding impact on the firms' financial well-being, tank owners validate every service, maintain a high level of inventory control and monitor for leaks. Corresponding to the financial liability, operators must preclude contamination of the fuel supply from groundwater or other sources to maintain the fleet of vehicles necessary for site operations.

Most Central Valley Rock, Sand and Gravel Association members have operated for decades at their current sites. As such, they share concerns about their environment and have a vested interest in maintaining the integrity of excavation and operation locations where they expect to continue working for many more years. Over the course of years, prompt and efficient clean up of leaking tanks has been supported by a combination of environmental, financial and operational concerns. These realizations lead members of the Central Valley Rock, Sand and Gravel Association to support the philosophy Assemblyman Sher has expressed in his legislation and to join their fellow Californians in a concern about hazards to groundwater.

State Water Resources Control Board staff must be commended for an exhaustive technological approach in preparing regulations to implement underground tank legislation. That technique however, is predicated on a "worst-case" analysis coupled with an assumption of inherent business error and mismanagement, which disregards actual and realistic hazard potential from vehicle fuel storage tanks.

Given the necessity for on-site fuel supply for their operations the State Water Resources Control Board regulations issued August 23, 1984 present serious financial and operational hurdles to Association members.

928 12th Street, Suite 402 • P. O. Box 1165 • Modesto, California 95353-1165 • Phone (209) 577-4072

Calaveras • Fresno • Kern • Kings • Madera • Merced • San Joaquin • Stanislaus • Tulare • Tuolumne

Statement on Proposed Regulations Governing Underground Storage of Hazardous Substances

While supporting the need for environmental scrutiny as proposed by Assemblyman Sher, the Central Valley Rock Association can find no indication that law comtemplated the extensive, duplicative and exhaustive measures contained in the draft rules. Nor can the Central Valley Rock Association determine the intent of this lawmaker to threaten the welfare of California businesses. And finally, none of the subject legislation includes any direction for shouldering business and industry with the determination and supply of data base information regarding groundwater or soils profiles.

The regulations' predisposition to assume the fault of any tank owner, unfortunately is coupled with overly-conservative cost estimates, little accounting for private enterprise time and staff worth, and a disregard for the inconsistencies and failures of mandated technologies. With these weaknesses, the regulations fail to provide a reasonable program which will lead all tank owners on a course toward environmentally-safe operation.

Examples of the overly-zealous nature of the regulations illustrate that these rules fail to fulfill or overextend the intent of the legislation, "to establish orderly procedures" (Section I, 25280 (5)(6)) of substances which "are potential source" (Section I, 25280 (2)) of contamination creating "a potential threat" (Section I, 25280 (3)) to health. Had the author envisioned as extensive a program as outlined in the August 23, 1984 regulations, such terms would not have been included in the bill.

Some of many specific examples include:

2631 (c) calls for "at least twice the maximum anticipated time" while Chapter 1038, 25291 (a) (2) explicitly states "for the maximum anticipated period." In its Statement Of Reasons, (3.6) staff attributes this discrepancy to difficulty in estimation and uncertainties in exposure. Tank owners, however, should not be expected to shoulder additional construction cost to underpin staff's lack of knowledge.

2631 (c) should be changed to the 25-year storm to reflect Chapter 1038.

2632 exemplifies the technological emphasis of these regulations. While Chapter 1038, 25291 (b) calls for "a monitoring system capable of detecting entry" and "a means of monitoring for water intrusion and for safely removing the water," the regulations mandate an extensive sump and sensor system with thresholds never intimated by the legislation.
In the Statement Of Reasons (3.18), it is acknowledged that "an intermittent automatic measuring system would satisfy the same measuring requirements" but the more expensive and specialized system was mandated because it "eliminates the dependency of the system on the operator for periodic activation." Human error and lack of ability is a consistent theme in the draft regulations but the legislation does not stipulate the use of costly technological tools to minimize such a risk.

2633 illustrates the critical philosophic difference between the enacting legislation and the proposed regulations. Chapter 1038, 25291 7(C) simply calls for a system "designed to provide early leak detection and response and to protect the ground water." However 2633 (e) dictates the plan "shall preclude the contact of any leaked hazardous substance" and requires proof to be demonstrated by the tank owner that a container and

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response plan will protect groundwater. There is no mention in the legislation of the soils testing required by 2633 (e) (3).

2634 has mandated all monitoring options outlined in the legislation, though the bill lists several alternative methods. Hydrostatic testing, for example, is an alternative to pressure testing. Pressure testing is called for "at time intervals" in the bill, not continuous as in the regulations.
The bill does not stipulate "daily" as seven-days-per-week nor does it contain the volumetric judgements of 2634 (d) (1-3). Addition of the response plan requirements is an obvious attempt by regulators to hinder owners opting to use 2634 and proceed with a single-walled motor vehicle full tank. The bill's reporting and response requirements are sufficient, additional response mandates are superfulous.

2635 and its Statement Of Reasons support the perspective that staff has been arbitrary and exhorbitant in its regulations. Chapter 1038, 25291 outlines clearly the construction requirements for new tanks yet staff, in its analysis explains it added construction standards it "feels are necessary" (Statement Of Reasons, 3.42) to carry out the intent of the law. For example, 2635 (c) 1,2 and 4 are totally outside the scope of Chapter 1038. 2635 (f) and (g) add weighty and expensive procedures to the bill's direction for overfill protection. Paradoxically, the Statement Of Reasons (4.17) for inventory control procedures on existing tanks (2643) explains that routine inventory reconciliation with wholesalers is standard accounting practice "since the tank operator wants to be certain that the volume delivered is equal to the volume he is being charged for. This procedure should prevent overfilling of tanks since the volume of the tank contents is determined prior to the delivery and the remaining volume can easily be compared to the volume to be delivered." Such acknowledgement casts substantial question on the necessity for the stringent provisions of 2635 (f) and (g). While the Statement Of Reasons (3.57) acknowledges that standards for corrosion protection already exist, an apparently arbitrary action was taken when "it was decided to require corrosion protection for all steel tank installations" (2635 (h)) to compensate for a possible but unlikely alteration in soil resistivity.

2640 illustrates the subjective judgements and reasoning behind the requirements for historic data, area and groundwater testing which are completely outside the letter or stated intent of the law. While directing these overlapping, expensive measures, staff justifies this burden on business by such reasoning as, "there is little in the way of a track record upon which to judge the purported capabilities of a given system to monitor underground storage tanks" and that they must be used "to compensate for inherent weaknesses in the monitoring system." (Statement Of Reasons, 4.4 and 4.5) Simultaneously, however, the regulations push business into the use of unproven technological equipment.

2642 contains provisions in excess of the legislation such as the threshold for volume loss, continuous pressure testing and alarm systems.

2644 to 2647 places a most costly and unfair burden on business. There is no provision in the legislation nor any indication in the intent, that the author proposed that business

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be required to drill wells for soils samples; establish groundwater levels or establish historic property use. Indeed, such provisions add substantially to the cost of implementing the regulations and this single factor could preclude tank use by many businesses, in turn forcing operations beyond a level of potential or anticipated return. Chapter 1038 calls for alternative methods of testing, including groundwater monitoring, as required by the local agency and on intermittent time schedules. Requirements for such provisions as registered personnel, specific thresholds for sampling and testing and mandated slant borings -- all out of the spectrum of the legislation -- allow business little local discretion in identifying less costly alternatives.

2647 and 2648 may be the best examples of the overly-duplicative nature of the regulations and illustrates how far afield they are from both the letter and spirit of the law. In the Statement Of Reasons (4.29) it is argued that assurance groundwater monitoring provides "confirmation" on the effectiveness of the multiple layers of testing required. It may be argued that if staff does not have confidence in its monitoring program, it should not be imposed at the expense of business viability. Similarly, by precluding the use of available local data concerning groundwater levels, business is saddled with a responsibility to create a data bank which clearly is not the intent of the legislation. This viewpoint is confirmed by the Statement Of Reasons commentary (4.30) that specific protocol is dictated for well drilling and sampling as it "permits data obtained from the underground tank program to be compared with data obtained from other state and federal monitoring programs that use the same protocols."

2651 and 2652 reiterate the law for the most part but fail to acknowledge policy currently under consideration by the Board specifically directing criminal or civil procedures in addressing unauthorized releases. 2652 (g) uses a broad brush to add requirements not outlined in the regulations. Such a provision gives business no avenue for determining ultimate cost and responsibility in the case of a release and allows government to operate without accountability.

Certainly these examples are not intended to be a comprehensive critique, but serve to illustrate some of the basic weaknesses which will impair a reasoned implementation of an environmentally-sensitive underground tanks program through these regulations.

As the above noted examples have illustrated, these regulations have various shortcomings:

--They are overly-zealous in the interpretation of the law and have used the law as a springboard for mandating programs and practices of questionable technological merit.

--A review of the Statement Of Reasons issued to support the regulations reveals contradictory reasoning to justify regulations that are unnecessarily duplicative.

--The entire regulatory framework rests on an assumption that all business would be unwilling to properly repair or install a tank and that owners would negligently or purposely fail to implement conscientious monitoring. Such an assumption is totally inconsistent with the profile of business operating in California under the nation's strictist environmental protection rules.

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Statement on Proposed Regulations Governing Underground Storage of Hazardous Substances

While staff has conducted an exhaustive technological review of underground tanks construction and monitoring, it has failed to fulfill its obligation to address adequately the impact of these regulations on business. The Fiscal Impact Report outlines costs which are universally believed to be too low to reflect the financial burden for business. A case in point, for example, is recent media coverage of monitoring well drilling at tanks in the San Francisco Bay area. Water quality officials there are quoted as estimating installation of each well at $2,000. The combination costs of initial well drilling, vadose zone monitoring and testing procedures estimated at $3,000 to $4,000 per tank in the Fiscal Impact Statement, therefore seems extremely unlikely in the face of these actual operating costs from the field.

Even more importantly, perhaps, is the lack of assessment of the actual impact of costs on business. The Fiscal Impact Statement lists costs but does not address impact. Even if regulatory costs were as low as the $9,500 listed by staff as the expenditure for initial installation, such an expense poses a threat to the very existence of small firms already operating under marginal return conditions.

Without such an assessment, the Board lacks the necessary information upon which to judge the ultimate effectiveness of the regulations.

Staff has failed to afford to business the worth of time and effort it extends to government. 2712 (f) allows for a three-month provisional permit with the rationale that "three months is a reasonable amount of time to finance and install equipment to meet the law." Yet, tank operators must make application for permit renewal six months in advance (2712 (d)) "to give the local agency time to review and approve the permit." Similarly, variance costs are calculated on the basis of technical staff time but consultants' fees, time for maintaining records and controls, plus additional overhead expenses related to the regulatory procedures are either not addressed or afforded little worth.

Completely unaddressed is the burden placed on business by the local implementation of regulations by counties or cities lacking the experience or sophistication to interpret them. The regulations are contradictory to the legislation in specifying detailed technological formats where Chapter 1038 calls for local discretion. While staff argues that the Board is not required to provide training, oversight or assistance to local governments to implement the regulations, it adopts an opposite point of view in exceeding its legislative direction found in Chapter 1038. While explaining its actions in several instances as standards which "lessen the need for local government, not necessarily familiar with tank design requirements, to review each individual tank design, ..."(Statement Of Reasons, 3.44) or " many, if not most, of the staff of the local governments charged with administering these regulations will have little experience in groundwater monitoring..." (Statement Of Reasons, 4.27) they ignore legislative direction for local, site specific judgements. Conversely, however, never addressed is the role of small business forced to adopt unproven technological tools whose validity and operation are beyond the scope of the agencies with the accountability for regulation

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enforcement. No risk factor or cost estimates are acknowledged for this precarious, expensive position of business.

Recommendations:

Recognizing the needs to protect California's groundwaters from substances which may leak from underground storage tanks, the Central Valley Rock Association suggests that several steps be taken to assure that regulations conform with the "orderly procedure" directed in the enabling legislation and needed to assure conformity with its intent:

--Establish as part of the regulations a reasonable time frame and methodology of testing with the goal of determining actual hazard potential. Using such rationale, sites with multiple tanks of long-term storage of hazardous materials would be afforded more scrutiny than smaller tanks of rotating motor vehicle fuel stock.

--Establish expanding levels of testing only for those sites which exhibit failure at a lower level. For example, simple pressure testing and inventory control could be an initial step with further testing required only when, or if, tanks failed to meet initial criteria.

-- Eliminate duplicative monitoring and multiple technological systems not directed in the legislation but based on the "worst case" analysis and, rather, adopt procedures which can provide reliable results in a cost-effective manner.

--Eliminate that soils and groundwater testing designed primarily or exclusively to establish data base information. As directed in the legislation, all such testing should be aimed at actual hazard response.

--Devise a phase-in period for all major construction requirements to allow a reasonable time to recoup revenues against capital investment.

--Prepare a complete, factual fiscal impact report using actual field operating costs, including assigned wage rates for overhead and time factors and addressing the impact of such costs on current operations. The Board should not act to implement any part of these regulations until afforded the opportunity for review of such a report.

--Revise the entire regulatory framework to eliminate the inherent assumption of blame and unwillingness of business to work toward uncontaminated groundwater. Such a negative perspective toward the object of the regulations is out of place and precludes a business-government cooperation which is critical to carrying out the intent of the legislation.

--Either delay, address or prepare for corresponding rules which have been announced from other state or federal regulatory bodies to streamline implementation of a comprehensive program.

Central Valley Rock, Sand and Gravel Association, Inc.
928 12th Street, Suite 402 • P. O. Box 1165 • Modesto, California 95353 • Phone (209) 577-4072

Statement on Proposed Regulations Governing Underground Storage of Hazardous Substances

--Prepare or support legislative or regulatory measures affording economic incentives, in the form of tax credits, appreciation adjustments or other vehicles, to assist business and industry in meeting the tremendous financial obligation mandated in this program.

Conclusion:

While staff has undertaken an exhaustive review of optimum systems to cope with "worst-case" scenarios, that academic-model perspective of the draft regulations actually threatens the implementation of sound, reasonable programs which would fulfill the intent of Assemblyman Sher, the majority of the Legislature and Governor Deukmejian. These regulations were drafted without the information and insight about their subject. As such they pose tremendous financial burdens for implementation of systems not necessarily proven to be effective and for securing data not needed or required. These regulations place business and industry in a position of accountability to local agencies unprepared to guide them toward reasonable methods of compliance. Refinement, redirection and simplification of the regulatory procedures will not only bring this program within the parameters of business but will make it an enforceable mandate from local government.

Most unfortunate, however, is the negative attitude toward business which underscores the entire regulatory framework. Not only is this philosophy misplaced by those charged with implementing this program, it is unwarranted. If business and industry did not support the need for environmentally-safe groundwater, thousands of operators would not have responded as conscientiously to the mandate for filing registrations for their tanks.

The Central Valley Rock, Sand and Gravel Association does not dispute the need for securing this state's groundwater. To comply with this need, however, they need reasonable direction from a government able to understand their limitations.

Submitted by: Ray B. Hunter
Legislative Advocate

Central Valley Rock, Sand and Gravel Association, Inc.
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#85

CALIFORNIA RENTAL ASSOCIATION

216 N. EAST ST. • WOODLAND, CA 95695 • (916) 666-4337

October 19, 1984

Statement to:

State Water Resources Control Board

P.O. Box 100
Sacramento, CA 95801
Attn: Harold Singer
Division of Technical Services

Subject:

Proposed Regulations Governing Underground Storage of Hazardous Substances

The California Rental Association welcomes the opportunity to comment on the regulations proposed by the staff of the State Water Resources Control Board to implement legislation adopted in 1983 and 1984 governing the use of underground storage tanks.

The California Rental Association is a trade association representing about 800 outlets which provide tools and equipment to industry, business, homeowners and recreationists. The majority of these rental yards are family-owned, small businesses and many are located in rural and urban-fringe areas. The average underground tank at these sites is 1,000-gallons and is used to store a rotating stock of motor fuel. A critical element of the rental business, which depends on the care necessary to enhance the longevity of motors and machines, is an on-site source of fuel for everything from lawnmowers and rototillers to backhoes and forklifts. Fuel represents one of the larger operating overhead expense for most of the California Rental Association members who maintain strict inventory procedures as a cornerstone of their accounting practices.

Members of the California Rental Association and their families live in the communities where their businesses are located. They depend on the population to support their business. Their local visibility, as well as their concerns for their personal environment, have led them to support the philosophy Assemblyman Sher expressed in his legislation. Members of the California Rental Association join everyone in California concerned about hazards to groundwater.

State Water Resources Control Board staff must be commended for an exhaustive technological approach in preparing regulations to implement underground tank legislation. That technique, however, is predicated on a "worst-case" analysis coupled with an assumption of inherent business error and mismanagement, which disregards actual and realistic hazard potential from small, vehicle fuel storage tanks.

Indeed, given the necessity for on-site fuel supply for the operation of a rental yard as well as the unreliability of fuel supplies in many rural areas, the State Water Resources Control Board regulations issued August 23, 1984 present serious financial and operational hurdles to the livelihood of a majority of California Rental Association members.

Received DTS
OCT 22 1984

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	H & H Rentals	Buena Park
Vice-President	JOE DORAN	
	A & A Tool Rentals & Sales	Stockton
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California Rental Association
Statement on Proposed Regulations Governing Underground Storage of Hazardous Substances

While supporting the need for environmental scrutiny as proposed by Assemblyman Sher, the California Rental Association can find no indication that law contemplated the extensive, duplicative and exhaustive measures contained in the draft rules. Nor can the California Rental Association determine the intent of this lawmaker to eliminate hundreds of California businesses. And finally, none of the subject legislation includes any direction for shouldering business and industry with the determination and supply of data base information regarding groundwater or soils profiles.

The regulations' predisposition to assume the fault of any tank owner, unfortunately is coupled with overly-conservative cost estimates, little accounting for private enterprise time and staff worth, and a disregard for the inconsistencies and failures of mandated technologies. With these weaknesses, the regulations fail to provide a reasonable program which will lead all tank owners on a course toward environmentally-safe operation.

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Some of many specific examples include:

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2631 (c) should be changed to the 25-year storm to reflect Chapter 1038.

2632 exemplifies the technological emphasis of these regulations. While Chapter 1038, 25291 (b) calls for "a monitoring system capable of detecting entry" and "a means of monitoring for water intrusion and for safely removing the water," the regulations mandate an extensive sump and sensor system with thresholds never intimated by the legislation.
In the Statement Of Reasons (3.18), it is acknowledged that "an intermittent automatic measuring system would satisfy the same measuring requirements" but the more expensive and specialized system was mandated because it "eliminates the dependency of the system on the operator for periodic activation." Human error and lack of ability is a consistent theme in the draft regulations but the legislation does not stipulate the use of costly technological tools to minimize such a risk.

2633 illustrates the critical philosophic difference between the enacting legislation and the proposed regulations. Chapter 1038, 25291 7(C) simply calls for a system "designed to provide early leak detection and response and to protect the ground water." However 2633 (e) dictates the plan "shall preclude the contact of any leaked hazardous substance" and requires proof to be demonstrated by the tank owner that a container and response plan will protect groundwater. There is no mention in the legislation of the soils testing required by 2633 (e) (3).

2634 has mandated all monitoring options outlined in the legislation, though the bill lists several alternative methods. Hydrostatic testing, for example, is an alternative to pressure testing. Pressure testing is called for "at time intervals" in the bill, not continuous as in the regulations.
The bill does not stipulate "daily" as seven-days-per-week nor does it contain the volumetric judgements of 2634 (d) (1-3). Addition of the response plan requirements is an obvious attempt by regulators to hinder owners opting to use 2634 and proceed with a single-walled motor vehicle full tank. The bill's reporting and response requirements are sufficient, additional response mandates are superfulous.

2635 and its Statement Of Reasons support the perspective that staff has been arbitrary and exhorbitant in its regulations. Chapter 1038, 25291 outlines clearly the construction requirements for new tanks yet staff, in its analysis explains it added construction standards it "feels are necessary" (Statement Of Reasons, 3.42) to carry out the intent of the law. For example, 2635 (c) 1,2 and 4 are totally outside the scope of Chapter 1038. 2635 (f) and (g) add weighty and expensive procedures to the bill's direction for overfill protection. Paradoxically, the Statement Of Reasons (4.17) for inventory control procedures on existing tanks (2643) explains that routine inventory reconciliation with wholesalers is standard accounting practice "since the tank operator wants to be certain that the volume delivered is equal to the volume he is being charged for. This procedure should prevent overfilling of tanks since the volume of the tank contents is determined prior to the delivery and the remaining volume can easily be compared to the volume to be delivered." Such acknowledgement casts substantial question on the necessity for the stringent provisions of 2635 (f) and (g). While the Statement Of Reasons (3.57) acknowledges that standards for corrosion protection already exist, an apparently arbitrary action was taken when "it was decided to require corrosion protection for all steel tank installations" (2635 (h)) to compensate for a possible but unlikely alteration in soil resistivity.

2640 illustrates the subjective judgements and reasoning behind the requirements for historic data, area and groundwater testing which are completely outside the letter or stated intent of the law. While directing these overlapping, expensive measures, staff justifies this burden on business by such reasoning as, "there is little in the way of a track record upon which to judge the purported capabilities of a given system to monitor underground storage tanks" and that they must be used "to compensate for inherent weaknesses in the monitoring system." (Statement Of Reasons, 4.4 and 4.5) Simultaneously, however, the regulations push business into the use of unproven technological equipment.

2642 contains provisions in excess of the legislation such as the threshold for volume loss, continuous pressure testing and alarm systems.

2644 to 2647 places a most costly and unfair burden on business. There is no provision in the legislation nor any indication in the intent, that the author proposed that business be required to drill wells for soils samples, establish groundwater levels or establish historic property use. Indeed, such provisions add substantially to the cost of implementing the regulations and this single factor could preclude tank use by many businesses, in turn forcing operations beyond a level of potential or anticipated return. Chapter 1038 calls for alternative methods of testing, including groundwater monitoring, as required by the local agency and on intermittent time schedules. Requirements for such provisions as registered personnel, specific thresholds for sampling and testing and mandated slant borings -- all out of the spectrum of the legislation -- allow business little local discretion in identifying less costly alternatives.

2647 and 2648 may be the best examples of the overly-duplicative nature of the regulations and illustrates how far afield they are from both the letter and spirit of the law. In the Statement Of Reasons (4.29) it is argued that assurance groundwater monitoring provides "confirmation" on the effectiveness of the multiple layers of testing required. It may be argued that if staff does not have confidence in its monitoring program, it should not be imposed at the expense of business viability. Similarly, by precluding the use of available local data concerning groundwater levels, business is saddled with a responsibility to create a data bank which clearly is not the intent of the legislation. This viewpoint is confirmed by the Statement Of Reasons commentary (4.30) that specific protocol is dictated for well drilling and sampling as it "permits data obtained from the underground tank program to be compared with data obtained from other state and federal monitoring programs that use the same protocols."

2651 and 2652 reiterate the law for the most part but fail to acknowledge policy currently under consideration by the Board specifically directing criminal or civil procedures in addressing unauthorized releases. 2652 (g) uses a broad brush to add requirements not outlined in the regulations. Such a provision gives business no avenue for determining ultimate cost and responsibility in the case of a release and allows government to operate without accountability.

Certainly these examples are not intended to be a comprehensive critique, but serve to illustrate some of the basic weaknesses which will impair a reasoned implementation of an environmentally-sensitive underground tanks program through these regulations.

As the above noted examples have illustrated, these regulations have various shortcomings:

--They are overly-zealous in the interpretation of the law and have used the law as a springboard for mandating programs and practices of questionable technological merit.

--A review of the Statement Of Reasons issued to support the regulations reveals contradictory reasoning to justify regulations that are unnecessarily duplicative.

--The entire regulatory framework rests on an assumption that all business would be unwilling to properly repair or install a tank and that owners would negligently or purposely fail to implement conscientious monitoring. Such an assumption is totally inconsistent with the profile of business operating in California under the nation's strictist environmental protection rules.

While staff has conducted an exhaustive technological review of underground tanks construction and monitoring, it has failed to fulfill its obligation to address adequately the impact of these regulations on business. The Fiscal Impact Report outlines costs which are universally believed to be too low to reflect the financial burden for business. A case in point, for example, is recent media coverage of monitoring well drilling at tanks in the San Francisco Bay area. Water quality officials there are quoted as estimating installation of each well at $2,000. The combination costs of initial well drilling, vadose zone monitoring and testing procedures estimated at $3,000 to $4,000 per tank in the Fiscal Impact Statement, therefore seems extremely unlikely in the face of these actual operating costs from the field.

Even more importantly, perhaps, is the lack of assessment of the actual impact of costs on business. The Fiscal Impact Statement lists costs but does not address impact. Even if regulatory costs were as low as the $9,500 listed by staff as the expenditure for initial installation, such an expense poses a threat to the very existence of small firms already operating under marginal return conditions.

Without such an assessment, the Board lacks the necessary information upon which to judge the ultimate effectiveness of the regulations.

Staff has failed to afford to business the worth of time and effort it extends to government. 2712 (f) allows for a three-month provisional permit with the rationale that "three months is a reasonable amount of time to finance and install equipment to meet the law." Yet, tank operators must make application for permit renewal six months in advance (2712 (d)) "to give the local agency time to review and approve the permit." Similarly, variance costs are calculated on the basis of technical staff time but consultants' fees, time for maintaining records and controls, plus additional overhead expenses related to the regulatory procedures are either not addressed or afforded little worth.

Completely unaddressed is the burden placed on business by the local implementation of regulations by counties or cities lacking the experience or sophistication to interpret them. The regulations are contradictory to the legislation in specifying detailed technological formats where Chapter 1038 calls for local discretion. While staff argues that the Board is not required to provide training, oversight or assistance to local governments to implement the regulations, it adopts an opposite point of view in exceeding its legislative direction found in Chapter 1038. While explaining its actions in several instances as standards which "lessen the need for local government, not necessarily familiar with tank design requirements, to review each individual tank design, ..."(Statement Of Reasons, 3.44) or " many, if not most, of the staff of the local governments charged with administering these regulations will have little experience in groundwater monitoring..." (Statement Of Reasons, 4.27) they ignore legislative direction for local, site specific judgements. Conversely, however, never addressed is the role of small business forced to adopt unproven technological tools whose validity and operation are beyond the scope of the agencies with the accountability for regulation enforcement. No risk factor or cost estimates are acknowledged for this precarious, expensive position of business.

Recommendations:

Recognizing the needs to protect California's groundwaters from substances which may leak from underground storage tanks, members of the California Rental Association suggest that several steps be taken to assure that regulations conform with the "orderly procedure" directed in the enabling legislation and needed to assure conformity with its intent:

--Establish as part of the regulations a reasonable time frame and methodology of testing with the goal of determining actual hazard potential. Using such rationale, sites with multiple tanks of long-term storage of hazardous materials would be afforded more scrutiny than smaller tanks of rotating motor vehicle fuel stock.

--Establish expanding levels of testing only for those sites which exhibit failure at a lower level. For example, simple pressure testing and inventory control could be an initial step with further testing required only when, or if, tanks failed to meet initial criteria.

-- Eliminate duplicative monitoring and multiple technological systems not directed in the legislation but based on the "worst case" analysis and, rather, adopt procedures which can provide reliable results in a cost-effective manner.

--Eliminate that soils and groundwater testing designed primarily or exclusively to establish data base information. As directed in the legislation, all such testing should be aimed at actual hazard response.

--Devise a phase-in period for all major construction requirements to allow a reasonable time to recoup revenues against capital investment.

--Prepare a complete, factual fiscal impact report using actual field operating costs, including assigned wage rates for overhead and time factors and addressing the impact of such costs on current operations. The Board should not act to implement any part of these regulations until afforded the opportunity for review of such a report.

--Revise the entire regulatory framework to eliminate the inherent assumption of blame and unwillingness of business to work toward uncontaminated groundwater. Such a negative perspective toward the object of the regulations is out of place and precludes a business-government cooperation which is critical to carrying out the intent of the legislation.

--Either delay, address or prepare for corresponding rules which have been announced from other state or federal regulatory bodies to streamline implementation of a comprehensive program.

--Prepare or support legislative or regulatory measures affording economic incentives, in the form of tax credits, appreciation adjustments or other vehicles, to assist business and industry in meeting the tremendous financial obligation mandated in this program.

Conclusion:

While staff has undertaken an exhaustive review of optimum systems to cope with "worst-case" scenarios, that academic-model perspective of the draft regulations actually threatens the implementation of sound, reasonable programs which would fulfill the intent of Assemblyman Sher, the majority of the Legislature and Governor Deukmejian. These regulations were drafted without the information and insight about their subject. As such they pose tremendous financial burdens for implementation of systems not necessarily proven to be effective and for securing data not needed or required. These regulations place business and industry in a position of accountability to local agencies unprepared to guide them toward reasonable methods of compliance. Refinement, redirection and simplification of the regulatory procedures will not only bring this program within the parameters of business but will make it an enforceable mandate from local government.

Most unfortunate, however, is the negative attitude toward business which underscores the entire regulatory framework. Not only is this philosophy misplaced by those charged with implementing this program, it is unwarranted. If business and industry did not support the need for environmentally-safe groundwater, thousands of operators would not have responded as conscientiously to the mandate for filing registrations for their tanks.

Members of the California Rental Association do not dispute the need for securing this state's groundwater. To comply with this need, however, they need reasonable direction from a government able to understand their limitations.

Submitted by: Ray B. Hunter
Legislative Advocate

85-C

CALIFORNIA RENTAL ASSOCIATION

216 N. EAST ST. • WOODLAND, CA 95695 • (916) 666-4337

November 26, 1984

Statement to:

State Water Resources Control Board

P.O. Box 100
Sacramento, CA 95801
Attn: Harold Singer
Division of Technical Services

Subject: Nov. 9, 1984 Draft Of Regulations Proposed To Govern Underground Storage Tanks

The California Rental Association appreciates the opportunity provided to comment on the revised draft of regulations issued Nov. 9 which are proposed to implement the legislation governing the underground storage of hazardous materials.

The California Rental Association is a trade association representing about 800 outlets which provide tools and equipment to industry, business, homeowners and recreationists. The majority of these rental yards are family-owned, small businesses and many are located in rural and urban-fringe areas. A critical element of the rental business, which depends on the care necessary to enhance the longevity of motors and machines, is an on-site source of fuel for everything from lawnmowers and rototillers to backhoes and forklifts. Fuel represents one of the larger operating overhead expense for most of the California Rental Association members who maintain strict inventory procedures as a cornerstone of their accounting practices.

Members of the California Rental Association and their families live in the communities where their businesses are located. They depend on the population to support their business. Their local visibility, as well as their concerns for their personal environment, have led them to support the philosophy Assemblyman Sher expressed in his legislation. Members of the California Rental Association join everyone in California concerned about hazards to groundwater.

A recent informal poll of the members of the California Rental Association indicates that more than half of those rental yards which contain underground fuel storage tanks have no more than two tanks per site, most commonly one tank for gasoline and one tank for diesel fuel. The most common sizes of tanks are 500, 550 or 1,000-gallons with 73 percent of those surveyed listing tank sizes of 1,000-gallons or less. On an average, the throughput is between 900 and 1,100-gallons per month, or about 12,000-gallons annually.

On-site fuel storage is necessary for rental yards to maintain the integrity of inventory, to minimize hazard to the general public and in response to consumer demand. Such storage has been held in underground tanks at the direction of fire marshals, worker safety inspectors and other regulators charged with public security.

The California Rental Association supports the increased versatility and efficiency of the Nov. 9 regulations drafted to accommodate the public commentary on earlier proposals. There remain, however, several areas of concern which threaten to pose

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undue and unnecessary financial burdens on small businesses. Concurrently, the California Rental Association continues to find that these regulations fail to address adequately the minimal risk/hazards posed by small tanks as exemplified by its industry survey:

Definition: Motor Vehicle Fuel

The specificity of the definition of motor vehicle fuel as that substance fueling a "self-propelled device by which any person or property may be propelled, moved or drawn" fails to address adequately the volume of "motor" fuel consumed and used in a pattern identical to that of "motor vehicle" fuel but for machines which do not meet the "self propelled" or movement of persons or property criteria.

This situation is particularly applicable to small business conditions where fuel from a single tank may be used for several purposes. This definition may unfairly block application of the inventory reconciliation monitoring alternatives from tank owners who register consistent volumes of throughput of fuel used for various types of motors such as cement mixers, rototillers and compressors which do not operate in self-propelled vehicles designed to move a load.

The reference in AB 1362 to "aviation fuel", expands the definition of substances to be regulated as motor vehicle fuel and clarifies the comprehensive applicability of the "motor vehicle" fuel designations in AB 1362. Conversely, there is no provision made for excluding machines and motors which utilize the same fuel in the same manner as that commonly used for self-propelled vehicles.

The term "motor vehicle", rather, is a generic term referencing fuel uses in vehicles and similar types of motors.

The merits and applicability of inventory reconciliation for monitoring should be available to any fuel tank owner who can meet its criteria.

Members of the California Rental Association report the majority of fuel use from their underground tanks is for "self-propelled" vehicles and as such they fall within the current regulation. There is a need, however, to clarify and extend this definition to accomodate implementation by local government.

Refinement Of Monitoring Alternatives:

The monitoring alternatives outlined in the Nov. 9 proposed regulations offer inventory reconciliation procedures which will provide useful, accurate, consistent underground tanks monitoring.

Currently, members of the California Rental Association use daily inventory procedures for accounting and security which can be expanded to incorporate the requirements and standards of the Nov. 9 regulations.

Current procedures and these additional inventory reconciliation requirements are sufficient for tank owners in the use category of the California Rental Association to detect and intercept any release prior to contamination of the groundwater.

Testing substances already are in use which monitor regularly for an influx of water into the fuel tank as a means of maintaining fuel integrity and diminishing equipment repairs/down times.

California Rental Association
Statement on Nov. 9, 1984 Draft Of Regulations Proposed To Govern Underground Storage Tanks

An initial hydrostatic test of the tank would establish an historic framework for local regulators. However, the amount of gallonage pumped, the size of the tanks and the diligence of owners in inventory reconciliation precludes the need for additional tank testing or other standards -- unless a shortage is discovered.

Section 25284.1 (b) (3) gives the Board the authority to rely on inventory reconciliation and directs that procedure for monitoring motor vehicle fuel tanks. It does not specify a time frame for tank testing nor does it dictate other monitoring provisions.

This threshold of monitoring is the most appropriate for small businesses such as the 800 members of the California Rental Association and many other similar tank owners who will be impacted by these regulations.

Interim Monitoring Procedures:

The three-year interim monitoring period is a welcome and important provision for small business.

The definition of this alternative must be expanded to include an allowance for certification of technology and testing procedures. The devastating impact on those small businesses victimized by the mandate to meet the vapor-recovery system must not be repeated through these regulations. Small business is placed in an untenable position when directed to incorporate procedures or technology which it has no resources to judge or assess. Any small business in this situation should be allowed to operate under interim procedures until certification of technology, procedures or operators is made by the responsible state agency.

Local Agency Direction:

In current operations, small businesses using fuel storage tanks interact closely with the local Departments of Weights and Measures. Officials from those departments are well versed in small business and their fuel dispensing operations. Therefore, incorporating oversight for the inventory reconciliation program for small business into the purview of Weights and Measures departments would best implement a comprehensive, workable and well-regulated program.

Conclusion:

Members of the California Rental Association recognize the need to insure the integrity of California's groundwater. They are willing to implement monitoring procedures to that end and request only that those regulations reflect the actual hazard posed by their small fuel storage tanks and their consistent but relatively small amount of throughput.

To that end, the Board and staff are requested to consider abrogating the need for duplicative monitoring by such small businesses above the stringent thresholds established by the inventory reconciliation alternatives. Also, rather than subjecting small business to possible victimization by unscrupulous vendors and operators of testing equipment, small firms with limited fuel throughput must be allowed to operate on an interim status until economically feasible procedures are certified by the responsible state agency.

The California Rental Association is very aware of the liability and responsibility of its membership in maintenance of their underground fuel storage tanks and looks forward to cooperating in a comprehensive program which adequately and judiciously addresses groundwater hazards from underground tanks.

Ray B. Hunter
Legislative Advocate

#85-E

CALIFORNIA RENTAL ASSOCIATION

216 N. EAST ST. • WOODLAND, CA 95695 • (916) 666-4337

January 18, 1985

Statement to:
State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95801-0100

Subject: <u>December 28, 1984 Proposed Regulations To Govern Underground Storage Tanks</u>

The California Rental Association is a trade association representing about 800 outlets which provide tools and equipment to industry, business, homeowners and recreationists. The majority of these rental yards are family-owned, small businesses and many are located in rural and urban-fringe areas. A critical element of the rental business, which depends on the care necessary to enhance the longevity of motors and machines, is an on-site source of fuel for everything from lawnmowers and rototillers to backhoes and forklifts. Fuel represents one of the larger operating overhead expense for most of the California Rental Association members who maintain strict inventory procedures as a cornerstone of their accounting practices.

Members of the California Rental Association join everyone in California concerned about hazards to groundwater.

A recent informal poll of the members of the California Rental Association indicates that more than half of those rental yards which contained underground fuel storage tanks have no more than two tanks per site, most commonly one tank for gasoline and one tank for diesel fuel. The most common sizes of tanks are 500, 550 or 1,000-gallons with 73 percent of those surveyed listing tank sizes of 1,000-gallons or less. On an average, the throughput is between 900 and 1,100-gallons per month, or about 12,000-gallons annually.

On-site fuel storage is necessary for rental yards to maintain integrity of inventory, to minimize hazard to the general public and in response to consumer demand. Such storage has been held in underground tanks at the direction of fire marshals, workers safety inspectors and other regulators charged with public security.

Despite the alterations included in the Dec. 28, 1984 proposed regulations which reflect the public commentary on earlier drafts, there remain some areas of continuing concern which threaten to pose undue and unnecessary financial and overhead burdens on small business.

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Monitoring Options To Recognize Small Business:

The flexibility of the eight monitoring alternatives offered in the current proposed regulations attempts to address varying conditions which impact the use of underground storage tanks in California. However, these regulations still fail to offer a monitoring alternative which adequately distinguishes unique conditions of small tanks holding relatively low amounts of throughput.

The number of groundwater monitoring wells required in monitoring Option Two is an example of excessive regulation for such tanks. In addition to mandating a greater number of wells than are necessary to assess adequately actual hazard levels posed by small tanks with low throughputs, the arbitrary gallonage limitation allowing a single well on a site with a single tank [3(a)], should be modified to avoid burdening small business.

Specifically, additional wells should not be required for tanks equal to and less than 2,000-gallons. In the case of the California Rental Association, possibly half of the operators have single tanks of 1,000-gallons. Under the current wording of Option Two, which requires two wells for tanks "equal to or greater than" 1,000 gallons, one gallon will force these tank owners to install an extra groundwater well, a costly and cumbersome process unnecessary to gauge the effects of a single gallon.

A similar problem is evident in the third section of Option Two which mandates a minimum of three wells for tanks of 1,000-gallons or larger. A typical multi-tank site of a small business such as the California Rental Association may include one 1,000-gallon tank and one 500-gallon tank. The third section of Option Two, therefore, would require three wells to monitor 1,500-gallons of underground storage and less than 20,000-gallons of annual throughput.

These specific aspects of Option Two underscore the need for a monitoring category to address the hazard levels posed by small tanks which carry low amounts of material. Without such designations, monitoring options which may be reasonable and useful for larger firms threaten to increase already marginal overhead operating expenses of small business to unrealistic levels.

Currently, members of the California Rental Association use daily inventory procedures for accounting and security which can be expanded to meet the strict requirements and thresholds of monitoring Option Five. Such procedures are sufficient to detect and intercept any release prior to contamination of the groundwater because of the small amount of material carried in these small tanks.

An initial hydrostatic test of the tank would establish an historic framework for local regulators. The amount of gallonage pumped, the size of the tanks and the diligence of owners in inventory reconciliation precludes the need for additional tank testing or other standards relating to geologic or groundwater conditions. This threshold of monitoring is the most appropriate for small businesses such as the 800 members of the California Rental Association and many other similar tank owners who will be impacted by these regulations.

Interim Monitoring Procedures

While the three-year interim monitoring period is an important provision for small business, the definition of this alternative must be expanded to include an allowance for verification of technology and testing procedures. The devastating impact on those small businesses victimized by the mandate to meeting the vapor recovery system must not be repeated through these regulations. Small business is placed in an untenable position when directed to incorporate procedures or technology which it has no resources to judge or assess. Any small business in this situation should be allowed to operate under interim procedures until certification of technology, procedures or operators is made by the responsible state agency.

Compliance Deadline

Directing private enterprise compliance by "the statutory deadline" as outlined in these regulations places a burden on small business which may be faced with implementing procedures and technologies that have not been accepted or reviewed by the local lead agency. Even the interim monitoring provision, unless redefined as suggested in this comment, calls for tank testing and pipeline monitoring. Small tank owners without technical staff expertise must have direction for selecting operators to test their tanks or devices necessary for pipeline monitoring to avoid victimization or costly expenditures which will not satisfy local government's implementation of these regulations.

Compliance with any provisions of these regulations, other than the inventory reconciliation standards, should be set aside until the local agency adopts the regulations, is prepared to issue permits and until the responsible state agency releases a list of certified testing operators and procedures.

Conclusion

The California Rental Association is very aware of the liability and responsibility of its membership in maintenance of their underground fuel storage tanks and looks forward to cooperating in a comprehensive program which adequately and judiciously addresses groundwater hazards from underground tanks.

To that end, the Association urges the Board and staff to include a revised monitoring provision for small tanks with low throughputs which may be monitored exclusively by the stringent thresholds established for inventory reconciliation. Also, rather than subjecting small business to possible victimization by unscrupulous vendors and operators of testing equipment, compliance with anything but the inventory reconciliation standards must be set aside until local government is prepared to oversee the program and state government can certify responsible, economically feasible procedures.

Ray B. Hunter
Legislative Advocate

#859.

CALIFORNIA RENTAL ASSOCIATION

216 N. EAST ST. • WOODLAND, CA 95695 • (916) 666-4337

May 28, 1985

Statement to:
State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95801-0100

Subject: Amendment of Regulations Pursuant To Office Of Administrative Law Disapproval Of April 1, 1985

The California Rental Association is a trade association representing about 1,000 outlets which provide tools and equipment to industry, business, homeowners and recreationists. The majority of these rental yards are family-owned, small businesses and many are located in rural and urban-fringe areas. A critical element of the rental business, which depends on the care necessary to enhance the longevity of motors and machines, is an on-site source of fuel for everything from lawnmowers and rototillers to backhoes and forklifts. Fuel represents one of the larger operating overhead expense for most of the California Rental Association members who maintain strict inventory procedures as a cornerstone of their accounting practices.

The California Rental Association is very aware of the liability and responsibility of its membership in maintenance of their underground fuel storage tanks and looks forward to cooperating in a comprehensive program which adequately and judiciously addresses groundwater hazards from underground tanks.

Believing that goal can be achieved while allowing these small business people to maintain the integrity of their livelihoods, members of the California Rental Association have appealed to the State Board and its staff to recognize the unique characteristics and low level of hazards posed by operators of small tanks (2,000-gallons or smaller) with low levels of throughput (20,000 gallons or less annually).

In the opinion memorandum issued April 2, 1985 by the Office of Administrative Law to support its disapproval of the adoption of Sections 2610-2714 of Title 23 of the California Administrative Code, that agency questioned the issue of overly-ambitious regulations adopted with little apparent regard to relating financial burdens threatening small business. These concerns have been expressed repeatedly during the rule-making process by the California Rental Association.

Received DTS

MAY 28 1985

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JACK WANAMAKER	Wanamaker Rents	Burbank
JOE WIEST	Wiest Rentals & Sales	Riverside
MARY ZIEGLER	HAZ Rentals of Placentia	Placentia

There is no indication, however, in the above-referenced amendments proposed by the State Board that either the public commentary or the Office of Administrative Law queries on this issue have been considered or addressed.

Two specific instances best serve to illustrate this apparent disregard by the State Board of the concerns voiced by the Office of Administrative Law:

> The amendments do not address nor include supporting material which delineates the "specific necessity" for the parts of Section 2641, as referenced by the Office of Administrative Law in page six, number one of its memorandum. The necessity of the stringent thresholds of these monitoring alternatives for existing tanks has been questioned repeatedly on behalf of small business which finds itself included in procedures designed to anticipate failures in larger systems.
>
> Similarly, there is no documentation of the response of the Board to the inquiry of the Office of Administrative Law, raised on page seven of its memorandum, concerning an explanation needed for rejection of proposed alternatives which would lessen the adverse economic impact on small business. Specifically, the memorandum reinforced the many of the questions and suggestions raised to the Board on behalf of small business, particularly concerning proposed alternatives and exemptions to certain provisions for tanks under a specified size.

The failure to respond to the specific instances cited above, as well as the lack of acknowledgment of the Office of Administrative Law's opening reasoning for disapproval -- the failure to summarize and respond to approximately 300 comments concerning the regulations -- indicates the Board's suggested amendments are deficient both in responding to the intent of the Office of Administrative Law's commentary and in encouraging public comment on alterations in the final rules.

Indeed, while incorporating specific and minor alterations to address clarity requirements, those procedural steps appear to be insufficient in meeting concerns of the continuing and potentially overwhelming impact on small business of the regulations adopted January 18, 1985. The apprehensions of the business community are reinforced by the issues raised in the Office of Administrative Law's memorandum supporting its disapproval of the regulations.

Conclusion:

As repeatedly illustrated to the State Board, the impacts of the underground storage tank regulations adopted January 18, 1985 are vast and potentially devastating for the small business. Those regulations were adopted based upon the assumption that the monitoring alternatives would provide the flexibility needed to accommodate various conditions. In light of the commentary of the Office of Administrative Law, however, members of the California Rental Association urge the Board to reconsider the regulations with a more stringent and realistic appraisal of their actual effect on firms with limited cash reserves and small margins of profit.

Further, the State Board should encourage commentary and public response on any supporting statements of reason which may be submitted to the Office of Administrative Law to respond to any portion of the rulemaking questioned by that Agency. By failing to encourage review by impacted small businesses of the Board's final statement of reasons on that issue, the Board eliminates a potentially edifying educational opportunity. Indeed, a statement of reasons has not been issued for public review with any of the draft regulation proposals which formed the basis of the final rule-making.

Members of the California Rental Association appreciate the opportunity to submit this comment and thank the Board for the opportunity to do so. The California Rental Association urges a reasoned, sound decision-making process to implement regulations which will safeguard the state's groundwater while not putting thousands of businesses and employers at peril.

Ray B. Hunter
Legislative Advocate

#86

H5

NATIONAL
PAINT &
COATINGS
ASSOCIATION

October 19, 1984

Mr. Harold Singer
Division of Technical Services
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Dear Mr. Singer:

Enclosed for the review and consideration of the State Water Resources Control Board are the comments of the National Paint and Coatings Association concerning the Proposed Regulation governing Underground Storage of Hazardous Substances, pursuant to Chapter 6.7 of Division 20 of the California Health and Safety Code.

Sincerely,

Robert J. Nelson
Associate Director
Environmental Affairs
Technical Division

RJN:vll

Received DTS

OCT 22 1984

1500
Rhode Island
Avenue, N.W.
Washington, D.C.
20005

Telephone
202 462-6272

BEFORE THE

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

SUBMISSION OF COMMENTS

IN RE

PROPOSED REGULATIONS GOVERNING

UNDERGROUND STORAGE OF HAZARDOUS SUBSTANCES

Pursuant to

Chapter 6.7 of Division 20 of the Health and Safety Code

On behalf of the

National Paint and Coatings Association

Date Submitted:

October 23, 1984

Submitted by:

National Paint and Coatings Association
1500 Rhode Island Avenue N.W.
Washington, D.C. 20005
(202) 462-6272

Received DTS

OCT 22 1984

I. The Issue

- On August 23 the State Water Resources Control Board (Board) issued proposed regulations to implement Chapter 6.7 of Division 20 of the Health and Safety Code. These regulations, which will be codified in Subchapter 16 of Chapter 3, Title 23, California Administrative Code (23 CAC Section 2010-2704), will establish the standards and procedures for counties and/or cities to develop and implement permit programs for underground storage tanks storing hazardous substances. These permits will incorporate construction standards for new tanks and monitoring, leak reporting and closure standards for both existing and new tanks.

II. Statement of Interest

The National Paint and Coatings Association, Inc. (hereafter referred to as the NPCA and headquartered at 1500 Rhode Island Avenue, N.W., Washington, D.C.) is a voluntary, non-profit industry association originally organized in 1888 and comprising more than 900 companies which manufacture consumer products and industrial coatings and the raw materials used in these products. Over 240 of these companies operate facilities in California. According to the U.S. Census of Manufacturers, California is the top paint producing state in the U.S. producing over 14.3% of the nation's total output or over 1.4 billion dollars worth of paint and coatings. The industry employs over 7,000 with a payroll of over $136.4 million.

In 1982 alone, the industry invested $112.7 million dollars in new capital expenditures in California. The production and related facilities responsible for this output operate some 2000 underground storage tanks across the state. Thus, the paint industry in California stands to be impacted significantly by the Board's storage regulations governing the permitting of underground tanks.

III. Overview of Concerns

The NPCA and its membership agree with the fundamental purpose of these regulations - the prevention of pollution and degradation of groundwater quality as a result of leaking underground storage tanks. However, the program that the Board is proposing is redundant and excessive and goes well beyond what is necessary to accomplish the goals of the implementing legislation. Instead of performance-oriented standards which would allow local authorities the flexibility that is the intent of the authorizing legislation, the Board has proposed a set of rigid requirements that tank operators must follow. In addition, the NPCA feels that the Board has exceeded the authority granted by Section 25288.2 of the Health and Safety Code by requiring that soil testing and groundwater assurance monitoring be implemented at all underground tank facilities. **Of particular concern to our members are the overly extensive monitoring requirements for existing underground tanks, and the unrealistic compliance** time schedule for implementation of the required monitoring systems.

NPCA endorses the thrust and substance of the more extensive comments offered on the proposed State Water Resources Control Board Subchapter 16 Regulations by the California Manufacturers Association. Our comments are intended to highlight those aspects of the proposal which are most troublesome from the paint manufacturers perspective, and to suggest an approach which gets the job done while taking into consideration individual circumstances and constraints.

IV. Compliance Time Schedule For Installation of A Monitoring System On All Existing Tanks

Some relief from the originally mandated compliance date of January 1, 1985 for installation of a monitoring system on all existing tanks has been granted by Assembly Bill #3565, which postpones the monitoring system compliance date until July 1, 1985. This still does not allow sufficient time for all existing tank operators to fully comply with the extensive monitoring requirements of the (Article 4) draft regulations and have an "approved" monitoring system in place. The Board's own Fiscal Impact Statement estimates that "it will probably take five years before all monitoring systems are in place and the program is fully operational".[1]

Some type of a phased-in implementation of the monitoring program must be adopted by the Board. Using the Board figures we estimate that there are nearly 7,700 facilities at which soil sampling and some type of well drilling will have to be completed by July 1, 1985.[2] Unfortunately, there are only thirty-seven weeks in which this is to be accomplished. We recommend that the Board consider establishing some kind of an interim status permitting system similar to that used by the U.S. EPA implementing the federal Hazardous Waste Management program. A detailed recommendation follows in Section V.

Additional time is needed not only to retrofit existing tanks with a monitoring system but to implement plans to close old tanks and install either new underground or above ground tanks. Some variance from the July 1, 1985 monitoring system deadline should be granted to these operators who have decided to close their present underground tanks in favor of installation of either new above or below ground facilities. This would not only provide operators with an incentive to replace older facilities, but would free-up

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[1]pp 1 Fiscal Impact statement for Proposed Subchapter 16 Regulation of Underground Tank Storage of Hazardous Substances.
[2]The Board estimates that there are 200,000 underground tanks with an average of 2.6 tanks per facility.

needed resources (trained drilling crews, etc.) who could be used elsewhere.

V. Interim Authorization for Existing Underground Tanks

The NPCA is suggesting this alternate approach to the implementation monitoring requirement for existing tanks because of the severe time constraints that have been placed on tank owners, and in the belief that the proposed monitoring requirements are redundant and excessive and should be modified to offer monitoring alternatives as directed by the enabling legislation.

Under this alternative approach the operator of an existing underground tank(s), would be granted interim authorization to continue operating his tanks(s) provided that the following criteria are met:

1) Submission of a permit form to the local authority having jurisdiction. The permit form would include a detailed monitoring plan which outlines how the operator intends to test his tank(s) for current leaks and monitor for future leaks. The monitoring plan would have to be completed within a given period of time (e.g. six months), related to the complexity of the monitoring system which the operator is proposing and subject to approval by the local authorities.

2) Certification that the operator had taken an initial step to insure that the tank(s) was not currently leaking (e.g. tank tightness test/visual inspection).

Once the initial monitoring step had been successfully completed, and his monitoring plan has received tentative approval from the local authorities, the operator would be granted interim authorization to operate his tank(s) for the time period needed to complete the installation of his monitoring system. Upon completion of his monitoring system, the operator would be eligible to receive a full permit.

This proposed phase-in of the implementation of the monitoring system for existing tanks would grant existing tank owners the necessary time needed to complete installation of the monitoring systems, which in some cases may be quite extensive, as well as providing additional time for local authorities to review and approve these plans, without exercising any detrimental effect upon the environment.

VI. Article 2: Definition of Terms

The definition of "Product Tight" should be revised to take into consideration the fact that many underground steel tanks are designed to allow for some corrosion by the material stored in them. Under the current definition, the regulations will not allow storage of corrosive materials in steel tanks.

In the definition of a tank, it is stated that piping leading into an underground storage tank is covered by the regulations. The Board should clarify whether underground piping connected to above ground tanks is covered by the regulations.

The "Special Inspection" definition should be broadened to include other certified professionals whose background and experience could be relied on to conduct a thorough inspection.

VII. Article 3: New Tank Construction and Monitoring Standards

While the NPCA defers to the California Manufacturers Association recommendations for many of the specific technical requirements of this section, we offer some special points.

The NPCA is perplexed over the Board's decision to allow the use of visual monitoring as the principal monitoring technique for existing tanks (Article 4, Sec. 2641) and ignore it in setting the monitoring standards for new tanks. If visual monitoring were allowed, many of the other required monitoring steps could be eliminated and an effective performance-oriented monitoring standard for new tanks could be devised.

In addition, the NPCA opposes the setting of standards based on the end use of the product stored (e.g. the special standard for Motor Fuel Tanks). We believe that standards for the construction and monitoring of underground tanks should consider the nature and hazards of the material being stored and not focus on its end use. This approach would eliminate many of the inconsistencies contained in the draft regulations.

Specifically: 1) in 2632(e), the term "Continuous sensor" should be re-defined to include any type of automatic equipment which routinely checks secondary containment on a periodic or cyclical basis; 2) Section 2632(f), should be revised to be more performance-oriented to allow for other types of monitoring systems (e.g. vacuum systems).

VIII. Article 4: Existing Underground Storage Tank Monitoring Criteria

NPCA believes that the proposed regulation for existing underground tanks would have the most drastic effect on the operation of facilities in our industry. We acknowledge and support the extensive comments of the California Manufacturers Association on this entire issue.

The proposed regulation of Article 4 would require every existing tank operator to follow a rigid set of requirements that are the most onerous of all the requirements in the proposed regulations.

The NPCA believes that if these proposed regulations become final as written, many operators of existing tanks will have no choice but to close their tanks. Whether or not this is the intent of the Board and its staff remains unclear. However, it is clearly not the intent of the Legislature. Had the Legislature intended to provoke a wholesale closure of underground tanks, it is doubtful that it would have emphasized through Article 4 the monitoring of existing tanks. In other words, proper monitoring should be required in a manner that safeguards against environmental damage while protecting the tank's underground status - regulatory overkill will only force the problem above ground, not eliminate it.

The Code lists a few possible alternative monitoring methods but left the development of specific alternatives up to the Board in order to build-in realistic flexibility.

We believe that the Board has been charged with developing a series of alternative monitoring approaches from which the operator and local agency can choose the method best suited to meet the needs of a particular facility. These alternative methods would take into consideration the materials being stored, the age and type of tanks, local groundwater conditions, and other pertinent factors. Unfortunately, the staff did not follow this path and has proceeded to draft regulations that require all existing tank operators to carry-out a specific multi-step monitoring program. This program could include daily visual monitoring, yearly tank testing, daily inventory control, soil testing, continuous vadose zone monitoring, and groundwater assurance monitoring. Where are the "alternatives" that the legislation mandated?

In addition, the NPCA believes the Board has exceeded the authority granted under this legislation when it turned a prospective law into one that looks at past practices.

"It is the intent of the Legislation in enacting this act, to establish orderly procedures that will ensure that newly constructed underground tanks meet appropriate standards and that existing tanks be properly mandated, inspected and tested so that the health or property and resources

for the people of the state will be protected." (Assembly Bill 1362. Section 1. (b).)

The NPCA takes exception to the underlined portion of the following statements found in Section 2640 (a) that "To be adequate, the monitoring system must be capable of detecting active and historic unauthorized releases, any unauthorized release that may occur in the future, and be capable of measuring the groundwater quality directly.

We feel that the enabling legislation does not mandate a monitoring system capable of detecting "historic unauthorized releases".

Section 25284.1 of the Health and Safety Code states ". . . the owner shall outfit the facility with a monitoring system capable of detecting unauthorized releases of any hazardous substance stored in the facility." No where in Section 25284.1 is there found authority to require operators to determine whether a past release had occurred.

Thus, the requirement that each tank operator determine the present condition of the soil around the tank at the site exceeds the scope of this legislation. Likewise, no mention is made of measuring groundwater directly.

Groundwater monitoring is listed only as a possible alternative method which may be required by the local agency, as long as it would be consistant with regulations of the Board.

By concentrating on past releases the Board is in reality implementing a remedial action program and not the program to maintain, inspect and test existing tanks that was intended by the legislation.

We also take exception to the Board's action to require specific monitoring systems (i.e., Section 2642 through 2646) where visual monitoring is unable to be implemented. By doing this the Board has not provided the flexibility that was written into the legislation and that is so necessary in order for industry to meet these regulations in a technically acceptable and cost effective manner.

A. Section 2642: Tank Testing

At the public workshop on September 17, the Water Resource Control Board personnel questioned the reliability of most tank tightness tests. They indicate that they needed additional data on these systems and if the data shows that certain of these tests are accurate and reproducible some lessening of the monitoring requirements may be justified. Currently, the U.S. EPA is conducting a series of tests to determine the reliability and accuracy of the various tank tightness tests. We urge that the Board postpone the final requirements for this section until the Board and the staff have had a chance to review the EPA findings.

B. Section 2643: Inventory Control

The inventory control requirements proposed in the draft regulations, while perhaps a good operating practice, should not be a regulatory requirement at manufacturing facilities. Inventory control is not an effective means of identifying tanks with small leaks because of the inability to measure small losses or gains accurately. Therefore, it is of limited use and actually redundant when applied with other more reliable leak identification methods. It should only be encouraged as an optional auxilary method of leak detection at retail facilities only.

C. Section 2644: Soil Testing and Exploratory Boring

As stated earlier, the NPCA questions whether authority to require an extensive soil testing programs for all underground tanks was given the Board by the enabling legislation. This alternative method of monitoring is really only applicable to past releases and would only be necessary if other monitoring methods indicated a high probability of an unauthorized release.

Under 2644 (c), vertical boring is listed only as an option if slant drilling is not possible. We recommend that this be revised to indicate that slanting boring is the optional choice if vertical boring is not possible. This change is justifiable since slant drilling is extremely risky and the number of available drilling rigs capable of performing slant drilling is limited.

(At the very least the regulation should be revised to indicate that, if groundwater is less than 50 feet below the surface, drilling would not be required because of the inherent impracticality and danger.)

IV. <u>Article 8: Categorical and Site Specific Variance Procedures</u>

Tank operators must have the opportunity to seek a variance based on a peculiar local groundwater or environmental situation or a unique facility design. But the proposed variance procedure and its accompanying high fees ($7,750 for site specific and time consuming public hearings) precludes this option as a viable alternative for most tank operators. This procedure must be streamlined and provisions for a minor deviation from the construction and monitoring requirement must be made allowable. Otherwise, the procedure will only tend to inhibit the use of new innovative technologies and designs.

X. Summary and Suggested Approach

The proposed requirements for the monitoring of existing underground tanks are overly restrictive, inflexible and redundant and will have a significant impact on the paint and coatings manufacturers in California.

NPCA believes that these proposed monitoring requirements can be modified to increase flexibility and reduce the impact on tank operators without compromising the ability of the program to prevent pollution and degradation of groundwater quality as a result of leaking underground tanks.

The complex matrix of monitoring requirements under the proposed regulation are graphically illustrated by Figure 1.

An alternative approach to monitoring existing tanks is illustrated by Figure 2. We feel this alternative approach offers increased flexibility without reducing the ability to identify leaking tanks.

The alternative approach would allow operators to select visual monitoring, tank tightness testing, or soil sampling as the initial step in determining if a tank(s) is currently leaking. Tank testing would be required for all tanks more than five years old. This recommendation is based on EPA studies which show that tanks over five years old have significantly higher incidence of leaks. A facility that does not detect a leak would then continue to implement an ongoing leak detection program. Up to four options would be available to operators and local authorities for the ongoing leak detection program depending on individual considerations (e.g. material being stored, type of tank, geology of the site, and any other factors the Board felt should be considered):

1. Vadose zone monitoring in conjunction with semi-annual verification monitoring;
2. weekly groundwater monitoring;
3. visual monitoring and
4. inventory control, tank testing and semi-annual verification monitoring.

The first two options are the same as those offered in the proposed regulation. The third option, visual monitoring, would be conducted on a regular basis (weekly at a minimum). The fourth option would require inventory control for retail outlets only, conducted in conjunction with annual tank testing and semi-annual verification monitoring.

We believe this alternate approach would provide the flexibility that the enabling legislation intended while insuring that existing tanks will be properly maintained, inspected and tested. The approach also lends itself to a phase-in of the monitoring requirements that was discussed in parts IV - V of these comments.

NPCA recognizes the problems that the Board and its staff face in implementing this regulatory program and hope that our comments will assist in this effort.

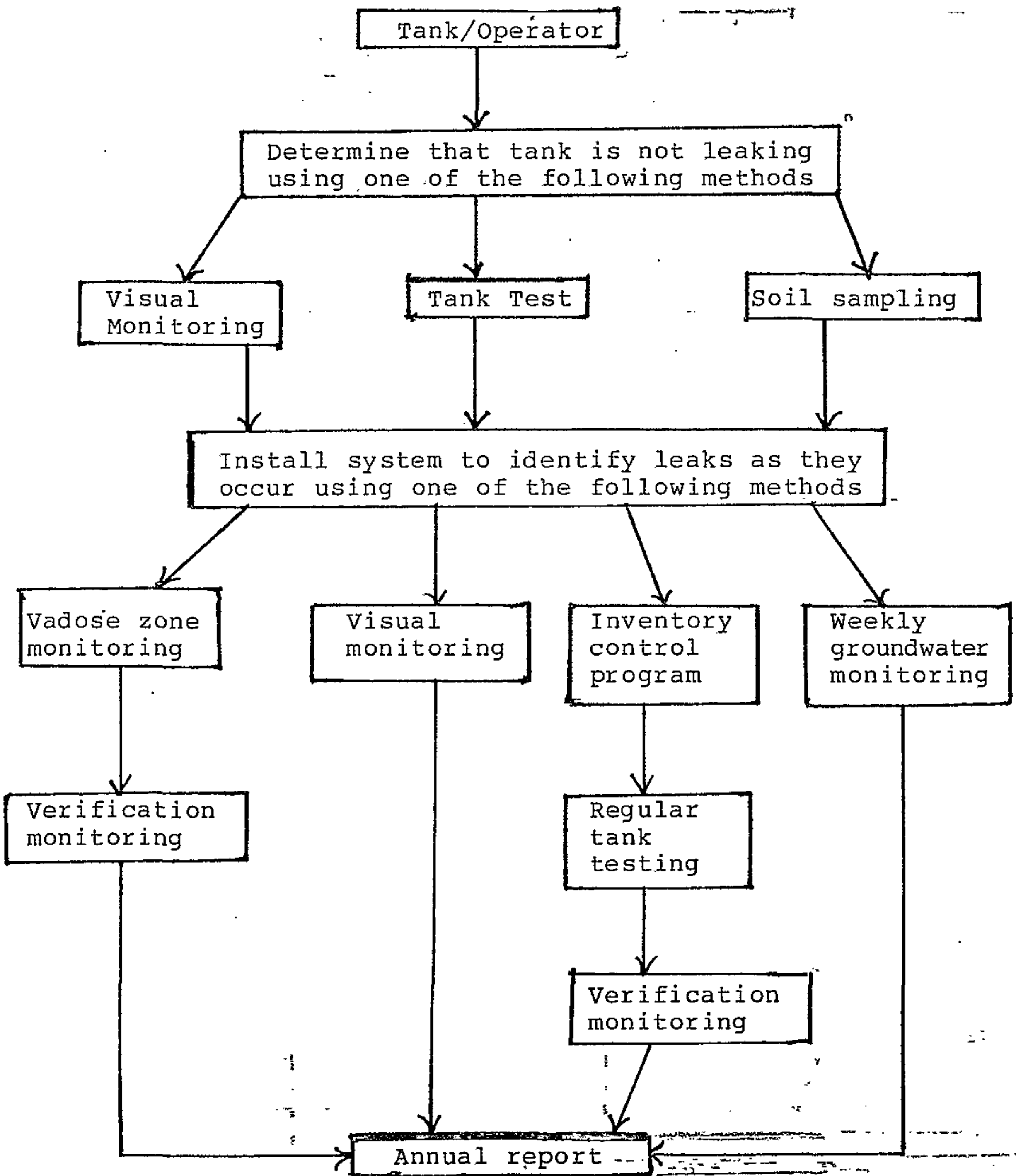
Respectfully submitted,

Robert J. Nelson
Associate Director
Environmental Affairs
Technical Division

RJN:vll

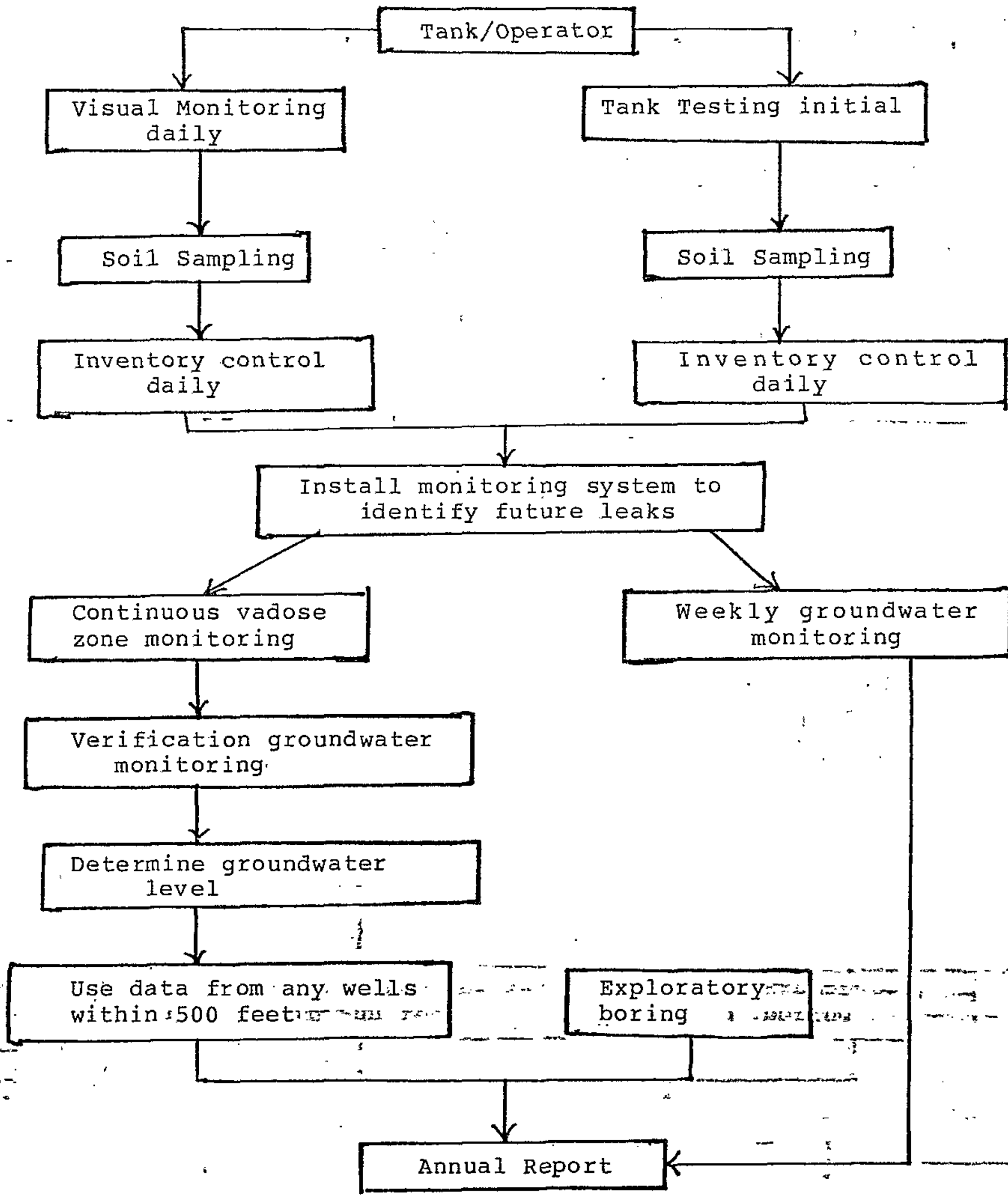
AN ALTERNATE APPROACH FOR THE MONITORING OF
AN EXISTING UNDERGROUND STORAGE TANK

Figure 2.



PROPOSED MONITORING REQUIREMENTS FOR AN EXISTING UNDERGROUND STORAGE TANK

Figure 1.



#86 B

ORAL TESTIMONY OF

MR. KENNETH FLAKS

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

SACRAMENTO, CALIFORNIA

OCTOBER 23, 1984

RE: PROPOSED SUBCHAPTER 16 REGULATIONS

I AM KENNETH FLAKS, PLANT MANAGER OF DE SOTO CHEMICAL CORPORATION IN BERKELEY, CALIFORNIA. DE SOTO IS A MAJOR COATINGS MANUFACTURER WITH PLANTS ACROSS THE COUNTRY INCLUDING PLANTS IN BERKELEY AND ORANGE. I AM TESTIFYING TODAY ON BEHALF OF THE PAINT MANUFACTURERS IN CALIFORNIA WHO ARE MEMBERS OF THE NATIONAL PAINT AND COATINGS ASSOCIATION IN WASHINGTON, D.C. REPRESENTATIVES FROM CALIFORNIA PAINT MANUFACTURERS AND STAFF MEMBERS OF THE NATIONAL PAINT AND COATINGS ASSOCIATION MET WITH THE STAFF OF THE STATE WATER RESOURCES CONTROL BOARD IN MARCH TO URGE THAT THESE REGULATIONS BE DRAFTED IN A WAY THAT AFFORDS FLEXIBILITY AND GIVES COMPANIES ENOUGH TIME TO CHOOSE THEIR COMPLIANCE OPTIONS AND PUT THE SYSTEM IN PLACE. WE WERE ALSO PLEASED TO PARTICIPATE IN THE SEPTEMBER 17 WORKSHOP AT WHICH THE STAFF OF THE BOARD INDICATED THAT THE REGULATIONS WOULD BE UNDERGOING SUBSTANTIAL REVISION. WE HOPE OUR

INVOLVEMENT THROUGH THE PROCESS AND OUR WRITTEN COMMENTS WILL HAVE A BENEFICIAL IMPACT ON THE PROMULGATION OF FINAL RULES.

OBVIOUSLY, IDENTIFYING LEAKING UNDERGROUND STORAGE TANKS, AND MONITORING FOR FUTURE LEAKS, IS A STATEWIDE PROBLEM. WE BELIEVE IT SHOULD BE TREATED ACCORDINGLY, WITH THE STATE ESTABLISHING FUNDAMENTAL GUIDELINES AND PROVIDING TECHNICAL OPTIONS -- WITH LOCAL GOVERNMENTS THEN TAILORING THE SYSTEM OF REGULATIONS TO LOCAL CONSIDERATIONS SUCH AS TOPOGRAPHY AND COMMERCIAL AND POPULATION DENSITY.

I ACKNOWLEDGE THAT THE LEGAL GRANDFATHERING CLAUSE MAY RESULT IN SOME LOCALITIES RUNNING WILLY-NILLY WITH DIVERGENT AND REDUNDANT REQUIREMENTS. HOPEFULLY, IF THE STATE DEVISES A CLEAR AND FLEXIBLE PROGRAM, LOCALITIES WILL BE INCLINED TO FOLLOW THAT PROGRAM UNLESS THERE IS A PECULIAR SITUATION WHICH WARRANTS SPECIAL LOCAL RULES.

THE CALIFORNIA PAINT MANUFACTURERS APPRECIATE THE IN-DEPTH, INTELLIGENT COMMENTS OFFERED BY THE CALIFORNIA MANUFACTURERS ASSOCIATION ON THE PROPOSED SUBCHAPTER 16 REGULATIONS. WE AGREE DOWN THE LINE WITH THEIR SPECIFIC EXPRESSED CONCERNS. AS AN INDUSTRY WITH APPROXIMATELY 2,000 UNDERGROUND STORAGE TANKS LOCATED THROUGHOUT THE STATE,

WE CONCUR WITH CMA THAT, IN GENERAL, MANY OF THE MONITORING REQUIREMENTS ARE TOO TECHNICALLY RESTRICTIVE AND UNNECESSARY TO ACCOMPLISH THE GOAL OF PROTECTING THE PUBLIC HEALTH. AN OWNER OR OPERATOR OF AN UNDERGROUND TANK WOULD BE BETTER SERVED BY A MORE GENERAL PERFORMANCE-ORIENTED STANDARD. OF PARTICULAR CONCERN TO OUR ORGANIZATION ARE THE OVERLY EXTENSIVE MONITORING REQUIREMENTS FOR EXISTING UNDERGROUND TANKS, AND THE UNREALISTIC COMPLIANCE TIME SCHEDULE FOR IMPLEMENTATION OF THE REQUIRED MONITORING SYSTEMS.

THE BOARD'S OWN FISCAL IMPACT STATEMENT ESTIMATES THAT "IT WILL PROBABLY TAKE FIVE YEARS BEFORE ALL MONITORING SYSTEMS ARE IN PLACE." THEREFORE, WE RECOMMEND A PHASED-IN IMPLEMENTATION OF THE MONITORING PROGRAM. FIRST, SOME VARIANCE FROM THE JULY 1, 1985 DEADLINE SHOULD BE OFFERED TO THOSE WHO CERTIFY THAT THEY INTEND TO CLOSE THEIR TANKS IN FAVOR OF NEW ABOVE OR BELOW GROUND FACILITIES WITHIN A REASONABLE TIME PERIOD.

IN ADDITION, AN INTERIM AUTHORIZATION PROGRAM FOR EXISTING TANKS SHOULD BE IMPLEMENTED AKIN TO THE INTERIM STATUS PERMITTING SYSTEM USED IN RCRA. UNDER THIS APPROACH, INTERIM AUTHORIZATION WOULD BE GRANTED IF THE TANK OPERATOR SUBMITS A PERMIT FORM DETAILING HIS TESTING AND MONITORING PLAN AND

CERTIFIES THAT HE HAS TAKEN AN INITIAL STEP TO INSURE THAT THE TANK IS NOT CURRENTLY LEAKING. THE OWNER WOULD THEN BE GRANTED INTERIM AUTHORIZATION TO OPERATE HIS TANK FOR THE TIME PERIOD NEEDED TO COMPLETE THE INSTALLATION OF HIS MONITORING SYSTEM. IN VIEW OF THE FACT THAT THERE ARE SOME 200,000 UNDERGROUND TANKS IN CALIFORNIA, ALL OF WHICH MUST COME INTO COMPLIANCE WITHIN THIRTY-SEVEN WEEKS, THIS MAY BE THE ONLY SENSIBLE APPROACH.

FINALLY, I BELIEVE THAT THE PROPOSED RIGID REQUIREMENTS FOR MONITORING EXISTING UNDERGROUND TANKS IN ARTICLE 4 ARE TOO ONEROUS AND UNNECESSARY. IT STRIKES ME THAT THE LAW COMPELS THE BOARD TO DEVELOP A RANGE OF ALTERNATIVES FROM WHICH THE LOCAL AGENCY AND OPERATOR WOULD CHOOSE. INSTEAD, DUE TO THE IMPERFECTION INHERENT IN ANY SINGLE MONITORING APPROACH. THE BOARD WOULD MANDATE AN ELABORATE AND EXPENSIVE "SHOTGUN" SYSTEM WHEREBY VIRTUALLY EVERY SYSTEM WOULD BE REQUIRED IN CONJUNCTION WITH ALL THE OTHERS. NOT ONLY DOES THIS EXCEED THE SPIRIT AND SCOPE OF THE ENABLING LEGISLATION, BUT IT IS INEFFICIENT. THE DETERMINATION OF WHICH AND HOW MANY MONTITORING PROCEDURES ARE NECESSARY CAN BE MADE BY THE LOCAL AGENCY BY REVIEWING CRITICAL INDIVIDUAL FACTORS AS THE AGE OF THE TANK, THE MATERIAL BEING STORED AND THE GEOLOGY OF THE GEOGRAPHIC AREA.

THE NPCA HAS DEVELOPED AN ALTERNATIVE APPROACH TO MONITORING EXISTING TANKS WHICH I FEEL OFFERS INCREASED FLEXIBILITY WITHOUT REDUCING THE ABILITY TO IDENTIFY LEAKING TANKS.

THE ALTERNATIVE APPROACH WOULD ALLOW OPERATORS TO SELECT VISUAL MONITORING, TANK TIGHTNESS TESTING, OR SOIL SAMPLING AS THE INITIAL STEP IN DETERMINING IF A TANK(S) IS CURRENTLY LEAKING. TANK TESTING WOULD BE REQUIRED FOR ALL TANKS MORE THAN FIVE YEARS OLD. THIS RECOMMENDATION IS BASED ON U.S. EPA STUDIES WHICH SHOW THAT TANKS OVER FIVE YEARS OLD HAVE SIGNIFICANTLY HIGHER INCIDENCE OF LEAKS. A FACILITY THAT DOES NOT DETECT A LEAK WOULD THEN CONTINUE TO IMPLEMENT AN ON-GOING LEAK DETECTION PROGRAM. UP TO FOUR OPTIONS WOULD BE AVAILABLE TO OPERATORS AND LOCAL AUTHORITIES FOR THE ONGOING LEAK DETECTION PROGRAM DEPENDING ON INDIVIDUAL CONSIDERATIONS SUCH AS MATERIAL BEING STORED, TYPE OF TANK, GEOLOGY OF THE SITE, AND ANY OTHER FACTORS THE BOARD FELT SHOULD BE CONSIDERED. THESE FOUR OPTIONS ARE:

1. VADOSE ZONE MONITORING IN CONJUNCTION WITH SEMI-ANNUAL VERIFICATION MONITORING;
2. WEEKLY GROUNDWATER MONITORING;
3. VISUAL MONITORING; AND
4. INVENTORY CONTROL, TANK TESTING AND SEMI-ANNUAL VERIFICATION MONITORING.

THE FIRST TWO OPTIONS ARE THE SAME AS THOSE OFFERED IN THE PROPOSED REGULATION. THE THIRD OPTION, VISUAL MONITORING, WOULD BE CONDUCTED ON A REGULAR BASIS (WEEKLY AT A MINIMUM). THE FOURTH OPTION WOULD REQUIRE INVENTORY CONTROL FOR RETAIL OUTLETS ONLY, CONDUCTED IN CONJUNCTION WITH ANNUAL TANK TESTING AND SEMI-ANNUAL VERIFICATION MONITORING.

WE BELIEVE THIS ALTERNATE APPROACH WOULD PROVIDE THE FLEXIBILITY THAT THE ENABLING LEGISLATION INTENDED WHILE INSURING THAT EXISTING TANKS WILL BE PROPERLY MAINTAINED, INSPECTED AND TESTED. THE APPROACH ALSO LENDS ITSELF TO A PHASE-IN OF THE MONITORING REQUIREMENTS AS I HAVE RECOMMENDED.

I RECOGNIZE THE PROBLEMS THAT THE BOARD AND ITS STAFF FACE IN IMPLEMENTING THIS REGULATORY PROGRAM AND HOPE THAT MY COMMENTS WILL ASSIST IN THIS EFFORT.

#87

Western Oil and Gas Association
727 West Seventh Street, Los Angeles, California 90017
(213) 627-4866

October 22, 1984

Harold Singer
Division Technical Services
State Water Resources Control Board
Post Office Box 100
Sacramento, California 95801

Re: Proposed Regulations Regarding Underground Tank Storage of Hazardous Substances

Dear Mr. Singer:

Enclosed are the comments of the Western Oil and Gas Association ("WOGA") on the above-referenced proposed regulations. Our comments are divided into two parts: The first part starts with our general legal comments and then gives specific legal and technical comments on a section-by-section basis. The second part contains an alternative monitoring program for underground storage tanks followed by the rationale for the alternative program prepared by Harding Lawson Associates at WOGA's request. We offer the alternative program as an example of one possible approach to the regulation of underground storage tanks. We believe Harding Lawson Associates makes a number of valid points which should be carefully considered by the staff, and we offer their report as a vehicle for future discussions. However, since time did not permit a full evaluation by WOGA's member companies of the alternative program, it should not be considered as representing a proposal that has been fully endorsed by WOGA or its member companies.

As you will see, WOGA is especially concerned about three aspects of the proposed regulations. First, we believe a longer public review period is required. Insufficient time has been provided for the necessary public review of and public input on regulations of this magnitude. We suggest that, at the very least, another workshop be scheduled before the proposed regulations are put in final form for consideration by the Board.

Second, the monitoring requirements for existing underground storage tanks, in Article 4 of the proposed regulations, go far beyond the monitoring authorized by the statute. California Health and Safety Code § 25284.1(b)

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states that, if visual monitoring is not possible, alternative methods for monitoring existing tanks "may be required by the local agency." The proposed regulations, however, do much more than provide alternatives which may be required by the local agency. Instead, the regulations set forth a number of monitoring requirements -- all of which are required. The Board should follow the statute and develop regulations for various types of monitoring to be required as determined by the local agency.

Finally, the enabling statute provides special monitoring requirements for motor vehicle fuel storage tanks. Once again, the regulations fail to make this distinction and require far more monitoring of such tanks than authorized by the statute. We ask the Board to provide only those monitoring requirements for motor vehicle fuel storage tanks called for by the statute.

Thank you for the opportunity to comment on the proposed regulations. If you have any questions, please call Ralph Edwards at (213) 683-6335.

Very truly yours,

Robert Harrison /s/

Robert N. Harrison,
Assistant General Manager

RNH:cj

Attachments

COMMENTS

On Behalf Of

THE WESTERN OIL AND GAS ASSOCIATION

Before the

STATE WATER RESOURCES CONTROL BOARD

October 23, 1984

Sacramento, California

Re: Proposed Subchapter 16 Regulations for Storage of Hazardous Substances

The Western Oil and Gas Association ("WOGA") is a trade association whose members conduct the majority of the producing, refining, transporting and marketing of petroleum products in western United States. WOGA wishes to thank the Board for the opportunity to submit comments on the proposed regulations for the storage of hazardous substances (the "Subchapter 16 regulations"). The majority of our comments are found in the section-by-section analysis which follows. These comments set forth our concerns with the proposed regulations and, in many cases, suggest language to address those concerns. However, before we begin our section-by-section analysis, there are a few major comments we would like to address.

To begin, the schedule for adopting these regulations was far too abbreviated. Draft regulations could have been circulated for review and comment much earlier in the development process and additional workshops held before the regulations were proposed for adoption. If this had occurred, information could have been exchanged between the staff and industry regarding technological feasibility, costs of various proposals and possible alternative approaches. This type of procedure was utilized very effectively by the Department of Health Services in the development of the California Assessment Manual and resulted in a more technically-sound set of regulations.

By comparison, it appears to us that the proposed Subchapter 16 regulations were developed with insufficient opportunity for meaningful interchange between staff and industry. At the first workshop held on May 17, only portions of the regulations were available for review and discussion. While a complete set of regulations was available at the August 30 workshop and the subsequent workshops held after the notice of public hearing was published, the timing was such that the staff could not make changes to the regulations prior to the public hearing. This limited the utility of the workshops for providing a forum for meaningful dialog.

Following rejection of the Subchapter 15 regulations by the Office of Administrative Law ("OAL"), it is clear that state law requires a full and adequate response to public comments, especially comments which raise questions as to whether the OAL criteria have been met.1/ Thus, allowing

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1/ Throughout these comments we will refer to the criteria used by the OAL to review regulations. These can be found in Cal. Gov't Code § 11349.1 and include: necessity; authority; clarity; consistency; reference; and nonduplication. They will be referred to generally as the "OAL Standards."

sufficient time and opportunity for the public to comment and for the staff to properly respond to the comments will, in the long run, save the Board time.

We realize that the short adoption schedule is due primarily to the deadlines found in the statute. However, the law also requires that procedures followed in adopting reuglations must be fair. California Hotel and Motel Assn. v. Industrial Welfare Comm., 25 Cal.3d. 200, 212, 157 Cal.Rptr. 840, 847 (1979) (an administrative agency must employ "fair procedures.") We question whether a one-day hearing, following the minimum notice and comment period provided for by statute, can be considered fair for regulations this complex.

Accordingly, we ask that additional workshops be held and that, at the very least, a second round of public comments and another public hearing occur before the regulations are adopted.

Turning now to our substantive comments, WOGA believes that the most significant problem with the proposed Subchapter 16 regulations is that they go far beyond the authority granted to the Board by the statute, especially with regard to the monitoring requirements for existing underground storage tanks (those installed on or before January 1, 1984). To illustrate some of the major inconsistencies, a brief review of the statute is in order.

Health and Safety Code § 25284.1 requires a tank owner to outfit a tank facility with a monitoring system capable of detecting unauthorized releases of any hazardous substances stored in the tank and to monitor the facility thereafter. § 25284.1(a)(2). One approved monitoring system is to provide for visual inspection of the tank. § 25284.1(b). Where visual monitoring is not practical, the statute states that the local agency may require alternative monitoring methods on a monthly, or more frequent basis. § 25284.1(b). The statute lists the following, noninclusive, alternative methods: (1) precision testing of the tank and associated piping as defined in a National Fire Protection Association pamphlet; (2) groundwater monitoring wells, with well location, number, depth, and sampling frequency to be approved by the local agency; (3) a continuous leak detection and alarm system in monitoring wells adjacent to the tank, approved by the local agency; or (4) in the case of motor vehicle fuel tanks only, daily gauging and inventory reconciliation, a pressurized line leak detection system and a tank integrity testing program.

The Legislature plainly provided in the statute that existing underground storage tanks ("USTs") be either capable of visual inspection for leaks or that alternative leak monitoring methods be employed. Moreover, recognizing that motor vehicle fuel tanks are typically more closely monitored than other USTs, the Legislature provided a specific alternative of daily inventory control for such tanks.

Article 4 of the proposed Subchapter 16 regulations, however, ignores the regulatory scheme envisioned by the Legislature. For example, where the statute provides that local agencies may chose from <u>alternative</u> monitoring methods where visual inspection of an UST is impracticable, the proposed regulations would require the tank owner to implement <u>all</u> of the alternative monitoring methods. Thus, under Article 4, if visual monitoring is impracticable, UST owners (unless they fall under very narrow and specific exemptions) must take daily inventory control measurements, drill exploratory soil borings, install either vadose zone detection monitoring or groundwater monitoring, and, if vadose zone detection is employed, provide for assurance groundwater monitoring. These regulations totally ignore the Legislature's clear direction that these monitoring methods are alternatives and that each method should not be required in every case.

Moreover, by requiring each alternative method to be used in all cases, the proposed Subchapter 16 regulations violate the statute's clear direction that the local agency be the body to determine which monitoring alternative should be employed. Section 25284.1(b) states that "[a]lternative underlying methods of monitoring the tank on a monthly or more frequent basis <u>may be required by the local agency</u>, consistent with the regulations of the Board." (Emphasis supplied.) This section makes no sense if every alternative method is to be required in each case. Thus, the Legislature gave the responsibility to determine which of the various monitoring alternatives should be employed in a given case to the local agency, the body most familiar with the particular groundwater and soil conditions in an area. As presently written, the proposed regulations usurp this function in favor of the Board and, thus, exceed the Board's statutory authority.

The proposed regulations also violate the Legislature's expressed intention that motor vehicle fuel tanks be treated differently from other tanks because they are routinely subject to daily inventory control and reconciliation. As written, the proposed Subchapter 16 regulations require motor vehicle fuel tank owners to install all of the monitoring systems required for other types of USTs.

Finally, the regulations state that one of the objectives of the monitoring program is "to determine if unauthorized releases . . . have occurred in the past." Subsection 2640(b). Subsection 2644(a), requiring soil testing, was expressly included "to determine if prior usage of the underground storage tank has resulted in an unauthorized release." Nothing in the statute gave the Board authority to search for past unauthorized releases. Health and Safety Code § 25284.1 speaks only of "a monitoring system capable of detecting unauthorized releases" of hazardous substances. It says nothing of <u>past</u> "unauthorized releases." In addition, the only reference to soil borings in

§ 25284.1(b)(2) states that one alternative monitoring method, groundwater monitoring wells, must include an "analysis of soil borings at the time of initial installation of the well." This section appears to require soil borings in order to establish a baseline if groundwater monitoring is the chosen alternative. This is significantly different from the proposed regulations, which mandate soil borings in an effort to find past unauthorized releases.

We now turn to our comments on specific sections of the proposed regulations.

Section-by-Section Analysis

Article 1

2611. Exemptions

The exemption for USTs located in counties or cities that adopted their own UST ordinances prior to January 1, 1984, should be revised for purposes of clarity and to conform to the exemption in Health and Safety Code § 25288, which sets forth the minimum requirements that must be met by such cities and counties. We suggest amending subsection (a)(1) as follows:

> "Underground storage tanks that are located within the jurisdictions of counties or cities where the county or city had, prior to January 1, 1984, adopted an ordinance which, at a minimum, meets the requirements of Health and Safety Code Section 25288."2/

2/ Changes in existing proposed regulatory language are shown by underlining.

Since subsections (a)-(d) merely paraphrase the statute, they should be deleted.

Article 2

2620. Definitions

"Motor Vehicle"

The definitions of "motor vehicle" and "motor vehicle fuel tank", which are used later in the special construction and monitoring sections for such tanks, cause tanks storing fuels used to propel vehicles which move "upon a highway" to be treated differently from tanks used to store the same types of fuels for boats, airplanes and trains. Since 1) "motor vehicle" is not defined in the statute, 2) the statute does not differentiate between fuels used in motor vehicles and fuels used in trains and airplanes, and 3) the intent of the statute is to control the storage of fuels, not vehicles, we suggest deleting the definitions of "motor vehicle" and "motor vehicle fuel tank" and adding a new definition as follows:

> "'Motor vehicle fuel' means a fuel that is intended to be used primarily in a self-propelled device by which any person or property may be propelled or moved."

We believe this change would also help to satisfy the clarity requirements in the OAL standards.

"Pipe"

As currently written, the definition of "pipe" would include vent lines and vapor recovery lines. To exempt those lines which do not normally contain product, we suggest adding the underlined language so that the definition reads as follows:

> "'Pipe' means any pipeline or system of pipelines which under normal operating conditions contains liquid and which is used in connection with the hazardous substances and which are not intended to transport hazardous substances in interstate or intrastate commerce or to transfer hazardous materials in bulk to or from a marine vessel."

This change will clarify the definition and make it consistent with the statute which defines "pipe" to include pipes used in the "storage" of hazardous substances. Health and Safety Code § 25280(q). In connection with our suggestion above, the words "including connecting piping" should be deleted from the definitions of "tank," so that the definition would read as follows:

> "'Tank' means any single container which is used for the storage of hazardous substances and which is subtantially or totally beneath the surface of the ground."

"Daily"

The word "daily" should be defined to clarify the daily monitoring requirements found in the proposed regulations. (See e.g., proposed sections 2543, 2645, 2646 and 2647.) Since many facilities do not operate seven days a week, we suggest adding the following definition:

> "'Daily' means normal operating day."

Article 3

2631. Construction Standards for New Underground Storage Tanks

Most of our comments concern subsection (e), and we have a number of changes to suggest. For purposes of clarity, the term "storage facility" in the first line should be changed to "secondary container." Also, the requirement that the secondary container must be able to accommodate the volume of a 100-year storm should be changed to a 25-year storm. Health and Safety Code § 25284(a)(5), which contained the 100-year provision, was amended by Assembly Bill 3565, adopted this year and signed into law by the Governor. The amended section now requires the accomodation of a 25-year storm. The change in the law will go into effect at roughly the same time these regulations are adopted and should be anticipated. Lastly, we believe that the reference to subsection "(e)" should be changed to "(f)". This appears to have been a typographical error since otherwise the section refers to itself. With the changes we have suggested, subsection (e) would read as follows:

> "If the secondary container is open to rainfall, then the secondary container must be able to accommodate the volume of the twenty-four (24) hour-twenty-five (25) year storm in addition to that required in subsections (d) and (f) of this section."

2632. Monitoring Standards for Underground Storage Tanks

Subsection (e) of section 2632 calls for "continuous" monitoring. This is not required by the statute, which states only that new underground storage tanks must

> "be designed and constructed with a monitoring system capable of detecting the entry of the hazardous material stored in the primary containment into the secondary containment. If water could intrude into the secondary containment, a means of monitoring for water intrusion and for safely removing the water shall also be provided."
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> Health and Safety Code § 25284(b).

Nothing in this section mandates expensive continuous or automatic monitoring and, accordingly, this requirement should be deleted as beyond the Board's authority and unnecessary for groundwater protection. Monitoring on a periodic basis, along with inventory control, is sufficient to detect leakage from the primary container and to satisfy the requirements of Health and Safety Code § 25284(b). Any leakage which does occur would be caught by the secondary container. Periodic monitoring should be based on the requirements of the local agency as specified by the statute. See Health and Safety Code § 25284.1. Also, if sensors are used to comply, there is no need to require removal of the sensor on a semi-annual basis. We suggest that this requirement be changed to "as needed."

With regard to subsection (e)(1), we have a number of suggestions. To begin, analyzing standing liquid to "best detection limits" is not necessary. If a hazardous substance is found in the secondary containment, then the problem is to determine where it came from, regardless of the amount of the hazardous substance found. In addition, it should not be necessary to require alarm systems since these facilities can be visually monitored for small amounts of standing liquid. Also, the requirement for immediate sampling is vague and should be deleted. Finally, the requirement for detecting 0.5 inches of standing liquid should not apply when water is normally expected to be present, such as rainwater. Accordingly, with these changes, subsection (e) would read:

> "The sump shall be monitored on a periodic basis as required by the local agency. Sensors if used, shall be calibrated and maintained as needed. The monitoring shall be capable of either:
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> "(1) Detecting within the sump 0.5 inches of standing liquid when any combination of a hazardous substance or water is present. All standing liquid shall be sampled and analyzed to determine the presence of hazardous substances. This requirement does not apply when water is normally expected to be present within the secondary containment; or
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> (2) Detecting within the sump 0.5 inches of the hazardous substance stored in the primary container(s)."

Subsection (f) also calls for continuous monitoring and an alarm system for double-walled tanks. Continuous monitoring and installation of an alarm is expensive and is unnecessary to protect the groundwater. Periodic monitoring should be sufficient to determine if leaks are occurring in the interstitial space between the walls of a double-walled tank. The subsection should be changed as follows:

> "(f) The interstitial space between the walls of a double-walled tank may be monitored using a pressure sensor or other

method as approved by the local agency. Double-walled tanks which utilize this leak detection system are exempt from the requirements of Sections 2632(c) through (e)."

2633. Construction Standards for New Motor Vehicle Fuel Tanks

We suggest adding an additional sentence to subsection (b) as follows:

> "New underground tanks constructed with primary and secondary levels of containment including double-walled tanks which satisfy the requirements in section 2631, shall be considered to fulfill the requirements of this subsection."

As this subsection is currently written, double-walled tanks do not meet the criteria specified, since most such tanks are not coated. Yet, we believe it is the Board's preference that double-walled tanks be installed. The language we suggest is necessary to clarify that the installation of a double-walled tank fully satisfies the requirements of section 2633 and exempts the owner/operator from all other requirements of this section.

Also, for purposes of clarity a new subsection (i) should be added to state:

> "Suction piping systems are exempt from secondary container requirements."

By definition, operation of such systems provides self-testing each time the equipment is used and assures that any leaks will be quickly detected.

2634. Monitoring Standards for New Motor Vehicle Fuel Tanks

Alternate construction standards are provided in section 2633 for new tanks which contain motor vehicle fuels. If an applicant complies with this section rather than with section 2631, then the monitoring standards specified in section 2634 apply rather than those specified in section 2632. The general monitoring requirements in section 2632 do not have some of the requirements found in section 2634, such as hydrostatic testing. The staff has indicated that double-walled tanks meeting the requirements of subsection 2631(h) should be exempted from the requirements for hydrostatic testing under section 2634. We ask that this be clarified. We also ask that the requirement for hydrostatic testing be changed to every three years, instead of every two years, to be consistent with the inspection required by Health and Safety Code § 25283.4(a). Accordingly, we suggest amending subsection (a)(3) as follows:

> "(3) Except for double-walled tanks meeting the requirements of Section 2633, hydrostatic testing of the tank every three years according to the criteria specified in Section 2642 of Article 4, and . . . ."

With regard to the casing monitoring requirements in subsection (c), we believe that continuous monitoring is not necessary or authorized by the statute and should be deleted. The monitoring requirements should be flexible and consistent with the design capabilities of the system. Accordingly, we suggest the following changes:

(c) "Monitoring of each casing described in 2634(b) shall be of a type and frequency to permit the detection and cleanup of materials leaking from the primary container before they reach groundwater. The determination of monitoring frequency shall be based on an evaluation which considers the following:

"1. Volume of the secondary container in relation to the volume of the primary container;

"2. The amount of time the secondary container must provide containment in relation to the period of time between detection of an unauthorized release and clean-up of the leaked materials.

With regard to subsection (d), which requires testing of underground storage tanks showing a loss or gain of a hazardous substance or water, we have several suggestions. First, using a daily loss or gain of 50 gallons to trigger the testing requirement is unrealistic, especially for very large tanks. Many petroleum storage tanks can experience daily variations in this range due to factors unrelated to product loss or tank integrity, such as temperature, gauging errors and meter calibration. Temperature differential occurs as a result of differences between the temperature of the delivered product and the temperature of the product in the tank, as well as changes in ground temperature. Gauging errors can be due to the slope of the tank or to a lack of precise information on the exact size and shape of the tank. If testing is required when there is a 50-gallon discrepancy, this will create too many "false alarms" and unnecessary testing will result. Therefore, we suggest that a more realistic discrepancy figure be substituted, either 100 gallons or five percent of the daily throughput, whichever is greater.

Finally, with regard to the requirements concerning a seven-day loss or gain in subsection (d)(2), we suggest changing the word "delivered" to "throughput" to be consistent with the changes suggested to subsection (d)(1) above and existing subsection (d)(3).

2635. General Construction Standards

Subsection (b)(3) requires either hydrostatic or pressure testing of double-walled tanks. This type of testing is unnecessary for double-walled tanks because other methods of inspection of the annular space will reveal leakage. Thus, this requirement is unnecessary and should be deleted.

Subsection (c)(1) sets forth requirements as to the location of underground storage tanks in relation to existing structures. This type of concern is beyond the scope of the statute and is already adequately covered by the process of obtaining the necessary building permits. In addition, NFPA-30 adequately addresses proper location of such tanks. Therefore, WOGA believes that this subsection should be deleted.

Subsection (f) sets forth the requirements for overflow protection systems. The statute does not mandate such systems but simply says that they may be required. For consistency we suggest that the word "shall" should be changed to "may" in this subsection.

In addition, for purposes of clarity, we suggest that subsection (g) be amended as follows:

> "The overflow protection system that may be required in subsection (f) of this section shall be satisfied for underground storage tanks containing motor vehicle fuels in which:
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> > "1. The tank is visually monitored and the filling operation is controlled by the facility or delivery vehicle operator during filling of the underground storage tank, or . . ."

The requirement to visually monitor the "fluid level" has been deleted because the fluid level cannot be observed during filling. The additional language in subsection (g)(1) is suggested because the facility operator may not always be present during delivery operations. As we understand it, the intent of the statute was to require that a responsible person watch the delivery operation to make sure that 1) the hose did not come loose during filling of the tank, and 2) that no over-filling occurred. Under current industry operating procedures, and as set forth in delivery contracts, vehicle drivers are totally responsible for the safe delivery of their load at the service station. This is done by visually monitoring the filling operation.

Subsection (g)(2) requires that, prior to filling, the available capacity of the tank must be determined to be at least 110 percent of the volume of the delivery vehicle's tank compartment. The 110 percent figure is unnecessarily high. We suggest the following changes:

"The available capacity of the tank to be filled is determined immediately prior to filling to be at least 103 percent of the volume of the entire tank compartment to be delivered as determined by tank gauging or the tank capacity has a minimum of 200 gallons outage as vapor space when the tank is filled to maximum working capacity whichever is less."

Article 4

As WOGA has noted in its general comments above, this article, as presently written, fails to follow the mandate of the enabling statute for UST monitoring alternatives. Instead, the proposed existing tank monitoring regulations would require a tank operator to conduct all of a series of monitoring methods that were clearly intended by the Legislature to be alternatives selected by the local agency, and not the Board. Health and Safety Code § 25284.1 provides for either visual monitoring or "alternative methods of monitoring . . . on a monthly, or more frequent basis" as "may be required by the local agency . . ."

In order to bring the proposed regulations into line with the dictates of the enabling statute, a number of structural changes to Article 4 must first take place. We propose the following:

(1) Section 2640(d)

As presently written, this subsection does not take into account the local agency's role in determining what should be the alternatives to insure UST monitoring. Therefore, WOGA proposes that the final sentence of this subsection be modified to read:

"However, unless visual monitoring is implemented for the entire underground storage tank throughout the entire year, other forms of monitoring shall also be implemented as required by the local agency."

(2) Section 2640(e)

This subsection sets forth the requirement that owners of USTs who are unable to implement visual monitoring "shall implement each alternate monitoring method as specified in Sections 2642 through 2646." Subsection 2640(e) should follow the statutory scheme by requiring owners of USTs who are unable to implement visual monitoring to implement only the alternative monitoring method selected by the local agency. The alternative method may be one of the methods described in sections 2642 through 2646.

(3) Section 2640(f)

WOGA suggests that a new subsection 2640(f)*/ be inserted which would make the provisions for motor vehicle fuel storage tanks parallel to the provisions in subsection 2640(e) as outlined above. Thus, new subsection 2640(f) would follow the statutory language in Health and Safety Code § 25284.1(b)(3). It would provide that owners of motor vehicle fuel storage tank systems would be able to monitor those systems through daily gauging, inventory control, tank testing and leak detection devices.

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*/ For consistency, existing subsections 2640(f)-(i) should be re-lettered.

(4) Sections 2642-2646

Each of these sections begins with a subsection (a) which requires all owners of existing USTs to comply with their requirements. These subsections (a) should be replaced with language such as the following:

> "(a) Any owner of an existing underground storage tank, who is required by the local agency to implement a [testing, inventory control, evaluation, vadose zone detection monitoring, or ground water leak detection] program shall comply with subsections (c) through (g) [or, the final subsection if different from '(g)'] of this section, unless the owner meets the requirements in subsection (b)."

Sections 2642-2646 each contain a subsection (b) which sets forth grounds which would exempt the owner from some or all of the requirements of those sections. WOGA believes that these exemptions should remain but that the local agency should have the discretion to determine whether a specific owner or operator should be exempted from any monitoring alternative chosen by the local agency. This change is supported by the language in Health and Safety Code § 25284.1(b)(2), which specifically gives the local agency discretion regarding implementation of any monitoring alternative.

Thus, these subsections (b) should be re-drafted to set forth the specific requirements which would have to be met to be exempt from the specific monitoring method. For example, subsection (b) of section 2642 would read:

"(b) Owners of existing underground storage tanks shall not be required to implement a testing program if they can demonstrate to the local agency that at least one of the following conditions applies:

(1) If visual monitoring pursuant to Section 2641 of this article has been implemented.

(2) If any test which meets the conditions described in subsection (c) of this section cannot be performed without significant excavation."

(4) Section 2646

The enabling statute, in Health and Safety Code § 25284.1(b), states that the local agency shall approve the location, number amd depth of wells and the sampling frequency. Nevertheless, section 2646 of the regulations specifies location and number of wells, their depth, and their sampling frequency.

This is clearly in excess of the Board's authority as defined in the OAL Standards. The regulations have all but ignored the role of the local agency as spelled out in the statute. We ask that the Board amend section 2646 to conform to the statute by giving the required discretion to the local agency.

Comments on Specific Sections

2640. Applicability

(1) 2640(a)-(b)

These subsections set forth the basic standards and objectives of the monitoring program for USTs. WOGA believes that two of the monitoring objectives are inconsistent with the statutory authority of the Board: (1) to detect unauthorized past releases and (2) to measure the quality of the ground water. The enabling statute requires that a monitoring system shall be "capable of detecting unauthorized releases of any hazardous substances stored in the facility." As stated in our general comments, nothing is said of past releases. Also, in order to detect unauthorized releases of hazardous substances, a monitoring system need not measure the quality of the groundwater. Leak detection systems such as inventory control or reconciliation, tank testing, soil sampling or vadose zone monitoring are sufficient to detect any unauthorized releases. Once such a release is discovered, ground water quality data may be required by the Regional Water Quality Control Board under the Porter-Cologne Water Quality Act. Thus, these regulations are not the proper forum to address this issue.

In fact, in some circumstances, a ground water quality monitoring well shaft could become a conduit for hazardous substances to travel from soil to groundwater. Until it is determined that hazardous substances have leaked out of the primary and secondary containment structures, no ground water quality monitoring should be required. In cases where the potential for ground water quality impairment is high, measuring ground water quality directly may be made part of the monitoring system. However, it makes no sense to require such monitoring for <u>all</u> UST facilities. We ask that these references be deleted in both subsections (a) and (b).

(2) <u>2640(c)</u>

This subsection requires that, if feasible, the initial monitoring of all existing USTs shall be capable of determining whether prior use of the UST has resulted in an authorized past release. As WOGA has noted above, the enabling statute only provides for monitoring systems "capable of detecting unauthorized releases." Health and Safety Code § 25284.1. Thus, subsection 2640(c) should be deleted as being beyond the authority granted to the Board.

(3) <u>2640(h)</u>

Subsection 2640(h) now reads: "All borings and wells constructed and sampled pursuant to this article shall utilize the construction and sampling methods specified in Section 2648 of this article." With regard to sampling, the only reference to sampling techniques in section 2648 is the requirement that: "The sampling equipment . . . shall be compatible with the stored product and shall not donate, capture, mark nor alter product constituents for which analysis can be made." Subsection 2648(a). This requirement seems to be something short of a "sampling method," and we would propose that the Board delete the reference in subsection 2640(h) to "sampling methods."

2641. Visual Monitoring

(1) 2641(b)

Subsection 2641(b) provides that the owner of a UST "is exempted" from the visual monitoring requirements if any one of four conditions is met. WOGA suggests that this language be changed to allow an owner the opportunity to conduct visual monitoring even if one of the listed conditions exists. Then the choice whether or not to be exempted would clearly be the owner's. The current language, "is exempted," could be interpreted to mean that if one of the listed conditions exists then the owner cannot engage in visual monitoring. We suggest that language be changed to "has the option of being exempted" and thereby ensure that the owner can make the determination.

(2) 2641(c)(3)

This subsection requires visual monitoring on a "daily" basis. As noted elsewhere in the comments (see page 9) "daily" should be defined, possibly, in terms of normal operating days. WOGA suggests as an alternative that the Board leave the frequency of visual inspections up to the local agency. This would allow the flexibility in compliance which is necessary given the tremendous range of types of USTs and operating conditions covered by these regulations. It may be impractical or unnecessary to visually inspect every tank on a daily basis. For example, some tanks will have a leak detection system which will make daily visual inspections redundant.

(3) 2641(c)(4)

As part of the visual monitoring program, this subsection requires "[r]ecordation and reporting of the liquid level in the tank at the time of the inspection." We see no reason why liquid levels should be reported on a daily basis. Local agencies administering the regulations are unlikely to be able to process or utilize daily liquid level information. We believe that recording the level and making such information available to the administering agency upon request should be sufficient.

2642. Underground Storage Tank Testing

(1) 2642(b)

A third exemption from the tank testing alternative in section 2642 should be recognized. If existing motor vehicle fuel storage tanks remain subject to sections 2645-2647, the monitoring requirements, then they should not also be required to tank test. The monitoring requirements in sections 2645-2647 are significantly more stringent than the tank testing requirements and should identify a leak from an underground storage tank sooner than it would be identified under the tank testing method. For example, monitoring is required in some cases to be continuous, whereas tank testing may only occur every ten or fifteen years, depending upon a tank's construction. Thus, the owner or operator should not be required to tank test and monitor.

(2) <u>2642(c)</u>

Subsection 2642(c) requires that any tank testing method used shall be limited to those methods which make adjustment for a number of factors listed in that subsection. WOGA suggests that in addition to test methods which make the required adjustments, the Board should also allow the use of any test method which conforms to National Fire Protection Association ("NFPA") standards. Those standards are in an NFPA publication entitled "Underground Leakage of Flammable and Combustible Liquids" (1983) at Sections 4-3.6 and 4-3.7. The NFPA standards are nationally recognized tank-testing methods and many owners and operators of USTs are already familiar with those testing procedures.

(3) <u>2642(d)</u>

This subsection establishes the frequency of testing USTs. Category B requires testing of all corrosion-resistant tanks within one year of permit issuance and yearly beginning fifteen years after installation. Corrosion resistant tanks include: fiberglass reinforced plastic ("FRP"), cathodically protected steel, and FRP-clad steel tanks. Unlike the two other corrosion resistant tanks, FRP tanks typically have a thirty-year warranty. WOGA suggests that an appropriate time to begin testing FRP tanks would be twenty-five years after installation instead of fifteen. Thus, we seek a change in Category B which would require a test for an FRP "within one year of permit issuance and yearly beginning twenty-five (25) years after tank installation." For all other corrosion resistant tanks, the fifteen-year interval would remain as it is in the current draft.

(4) 2642(h)

Subsection 2642(h) requires that pressurized portions of underground storage tanks "shall be monitored utilizing an on-line pressure loss detector and flow reduction device." The detection is to be connected to a visual or audible alarm system. The Board should make this subsection consistent with the requirements in Subsection 2633(f) (construction standards for new motor vehicle fuel storage tanks) which also pertain to pressurized portions of underground storage tanks. In subsection 2633(f), the detector is not required to be connected to a visual or audible alarm system if the flow restriction device provides at least a 50 percent reduction from normal flow rates.

There is simply no support for requiring a detector to be connected to a visual or audible alarm system and a flow restriction device for purposes of tank testing under subsection 2642(h) while at the same time allowing the detector to be connected to either a visual or audible alarm system or a flow restriction device for motor vehicle fuel tanks. The owner of the tank should have the option of using the alarm or flow restriction device in all cases.

2643. Inventory Control

(1) 2643(a)-(b) and d(3)

These subsections impose inventory control requirements on "owners" of existing USTs. WOGA asks that the Board specify "operators" instead of owners since the operator will generally be the person responsible for daily activities associated with the tank, including inventory control. In addition, Health and Safety Code § 25284.1(b)(4), as amended by A.B. 3781, specifies that "operators," not owners, shall be the persons responsible for inventory control for motor vehicle fuel underground storage tanks.

(2) 2643(c)

WOGA's concerns with this subsection have been addressed in more detail elsewhere, but for completeness will be summarized here. "Daily" inventory control only makes sense if "daily" is defined to mean operating days.

(3) 2643(c)

This subsection requires that meters used for daily inventory control "shall be approved for use by the County Department of Weights and Measures." WOGA suggests that the Board add to that sentence: "or shall be approved by a person licensed by the County Department of Weights and Measures." This addition would make it clear that those individuals licensed by the county to approve such meters would also be available to approve meters in addition to county personnel.

(4) 2643(e)

This subsection requires verification of wholesale meter delivery records according to the procedure outlined. For a large percentage of the USTs covered by these regulations, this verification procedure will not be effective. For example, at retail gasoline stations, the only way to verify metered deliveries is through the use of a stick to measure the depth of fuel in the tank. The reading on the stick can be converted to fuel volume using a table prepared for each particular tank. While a stick can be a very effective means to detect a trend over a period of time, it is inherently less accurate than a County Department of Weights and Measures-approved meter used in a delivery vehicle. See also WOGA's comments at page 15. Thus, it makes no sense to require verification of the meter by use of a less accurate method of measurement.

If the Board should decide to leave this subsection in the regulations then, at the very least, it should amend the quantities which trigger a re-evaluation. As just noted, inaccuracies in stick measurements make the current threshold quantities of "the lessor (sic) of one-half percent of the delivery volume or 50 gallons" too low. At these levels, re-evaluations will be required for the wrong reasons on a frequent basis.

Therefore, WOGA suggests that the Board adopt the following language to replace the first sentence in subsection 2643(e)(4):

"A difference of the greater of 5 percent of the daily throughput delivered to the tank or 100 gallons shall be the cause for a re-evaluation of the measurements."

(5) 2643(f)

WOGA believes, as it has stated above, that stick measuring is far from an exact science. Reliance on a single daily measurement as an indication of tank leakage will result in far too many false alarms. Therefore, WOGA suggests that the Board make the following changes to subsections 2 and 3:

(1) "Daily loss or gain of 100 gallons or 5% of throughput, or "

(2) "Seven (7) day loss or gain of five percent of the throughput of motor vehicle fuel delivered over the seven days, or"

(3) "Cumulative (calculated over a period of at least thirty (30) days) loss or gain of one-half percent of the volume of motor vehicle fuel throughput over the period that the cumulative gain or loss is calculated."

Sections 2644-2647 - General Comments

The following comments raise questions and suggest changes to these sections based upon their applicability to motor vehicle fuel storage tanks. By the staff's own estimate, these tanks comprise over two-thirds of all the tanks that will be covered by these regulations. Yet because of the nature of the substance stored in these tanks, many of these sections are simply too stringent. The problem is that the petroleum products in the motor vehicle fuel storage tanks have specific, known properties which make some of the requirements in the following sections unnecessary.

For example, petroleum products have a viscosity similar to water yet vaporize more readily than water. They will therefore migrate through the unsaturated zone at approximately the same rate as water, yet vaporize readily. Since most petroleum products are immiscible or of low solubility in water and have a density less than water, they will float on the surface of ground water.

These properties of petroleum products are well-known, and established monitoring techniques have been developed which make use of these properties. Many of our comments suggest changes to sections 2644-2647 which we believe make sense for tanks holding petroleum products.

<u>2644. Soils Testing and Exploratory Boring</u>

(1) <u>2644(c)</u>

This subsection requires all owners of existing USTs to drill slant borings for soil testing. This requirement, in addition to being beyond the Board's authority pursuant to the Health and Safety Code, makes little practical or technical sense. The requirement for slant boring is apparently based on the assumption that discharges from a leaking underground storage tank migrate vertically downward, with little lateral migration. Thus, presumably, slant borings would reveal the presence of leaked substances directly beneath the tank.

However, the instance of a leaked substance migrating through the unsaturated zone with little or no lateral migration would be extremely rare. Practically all unconsolidated and semi-consolidated materials are deposited in nearly horizontal layers. As a result, preferential permeability pathways are established in the direction of least resistance. Any layer of fine-grained material deposited in a coarse-grained zone, such as a sandy layer within a gravel zone, or a clay-rich layer within a medium sand layer, will enhance the likelihood of lateral migration in the unsaturated zone.

The evidence gathered from past subsurface spill investigations supports the contention that fluids in the unsaturated zone migrate both vertically and laterally. Thus, the assumption that leaked liquids migrate only vertically is demonstrably false in the vast majority of instances, and the requirement for slant borings unnecessary.

WOGA therefore recommends that this subsection be deleted from the proposed regulations as being both beyond the Board's statutory authorization and as unnecessary.

(2) 2644(e)(4)

This subsection would require that a registered civil engineer or geologist or a certified engineering geologist competent in soils engineering log and describe soils removed from a boring. Based upon field experience, WOGA believes that such a requirement is unnecessary. The identification of soil samples is effectively being performed in the field by non-registered engineers, geologists, soil scientists and other professionals on a daily basis. As a practical matter, registered civil engineers, geologists or certified engineering geologists are rarely involved with such day-to-day field work. As presently written, subsection 2644(e)(4) would exclude from such field work those persons who are actively involved and may be better qualified.

WOGA proposes that the subsection provide that the logging of borings and description of soils be undertaken under the supervision of registered or certified personnel. It proposes the following changes to subsection 2644(e)(4):

> "All borings shall be logged in detail and the soils described according to the Unified Soils Classification System under the supervision of a registered civil engineer or registered geologist competent in soils engineering."

2645. Vadose Zone Detection Monitoring

(1) 2645(b)

This subsection provides a series of exemptions from the requirement for vadose zone monitoring of USTs. WOGA believes that a further exemption should be granted for tanks that contain immiscible, low-density (*i.e.*, less than water) fluids.

Vadose zone monitoring systems of whatever type are complex and are largely an unproven indication of storage tank leakage. However, ground water monitoring where ground water is at a depth of less than 40 feet is a proven and successful method of detecting such leaks when the leaked fluid is of a low density, such as hydrocarbons. The presence of such fluids on the ground water is readily apparent by visual inspection of the sampled water.

Therefore, WOGA proposes the addition of subsection 2645(b)(5) to read as follows:

> "The tank contains only fluids which are immiscible in water and which have a density less than water, and the depth to ground water is less than 40 feet."

(2) 2645(e)

As WOGA has noted above, the local agency is best suited to determine the proper location of monitoring systems because it is most familiar with the particular geological and hydrogeological conditions in its area. Therefore, WOGA suggests that subsection 2645(e) be rewritten as follows:

> "Subsurface systems shall be located as required by the local agency."

(3) 2645(f)(1)

WOGA agrees that some provision should be made to demonstrate the reliability of vapor monitoring methods. However, as this subsection is currently written, it provides for testing on a site-by-site basis, even where identical tanks containing the same or similar products and employing identical monitoring systems may be in place at numerous other locations. We propose that this section be rewritten to provide for a single demonstration of a vapor monitoring system for multiple-tank installations where a common product is stored and a similar backfill material is used.

Therefore, WOGA proposes the following changes to subsection 2645(f)(1):

> "Vapor monitoring for underground storage tanks may be used in accordance with the following criteria if the vapor characteristics of the stored product are susceptible to detection:
>
> "(1) Before any method of vapor monitoring is approved for a specific site, <u>or for multiple sites (defined as tanks containing similar types of product situated in similar backfill material)</u> it shall be demonstrated by an actual on site demonstration, <u>or in the case of multiple sites, at a single location chosen by the local agency at random</u>, using an appropriate tracer substance, that vapor could actually be detected by the installed system.

(4) <u>2645(h)</u>

This subsection requires the tank operator to conduct continuous vadose zone monitoring, if feasible. Based upon the known operational history, the reliability of continuously operating vadose monitoring systems has not been established. Until it can be shown that continuous operation is feasible, such monitoring should not be required.

The requirement that monitoring, if not performed continuously, should be performed weekly, is similarly unnecessary in most cases. For example, operators of motor vehicle fuel storage tanks will be required to take daily inventory measurements that would show any major loss of product well before vadose zone monitoring would reveal it. If the loss of product is minor, monthly vadose monitoring will be as effective in detecting a leak at a far more efficient cost. WOGA therefore recommends that this section be deleted from the proposed regulations as unnecessary. At the very least, service stations and other businesses which must conduct daily inventory control should be exempt from weekly monitoring requirements.

2646. Ground Water Leak Detection Monitoring

(1) 2646(c) and (d)

These subsections will be discussed together because they present similar problems. As stated above, the enabling statute for these regulations does not authorize the Board to require both vadose and groundwater monitoring. Further, conducting both vadose zone and ground water monitoring is unnecessary where ground water is near the ground surface. In such situations, ground water monitoring will in most cases be the most effective and dependable method for leak monitoring because it is simpler and has a proven operational record. Moreover, if the ground water is located near the base of the tank, vadose monitoring would not reveal a tank leak prior to groundwater impact.

Because both existing sections improperly and unnecessarily provide for both vadose and ground water monitoring, WOGA proposes that they be eliminated from the regulations.

(2) 2646(e)(1)

As WOGA has noted earlier, the enabling statute provides that the local agency is the proper body to determine the location and number of monitoring wells. We therefore stress again that this subsection should be modified to conform to the statute. However, there are also technical problems with the subsection as written. It appears to assume that for any given tank location, there is no information available concerning the direction and rate of ground water movement or its depth. In actual practice, at many sites direct and supportive evidence exists to show the general direction, flow rate and depth of ground water. In such situations, an equal distribution of monitoring wells around the entire tank perimeter is unnecessary to effectively monitor the storage facility. Fewer wells, situated on the downgradient side of the storage facility would provide effective monitoring data.

While a maximum radial distance between monitoring wells of 30 feet may be appropriate for certain substances, for hydrocarbons this limit is too conservative. When free hydrocarbons come in contact with ground water, the water is temporarily depressed by the hydrocarbons. The extent of the water table depression is contingent upon the rate of loading, the type of product, and the permeability of the sediments. After this initial water table depression, the product migrates laterally in all directions until a point at which the water gradient begins to dominate the flow regime of the two fluids. Generally, for equal quantities of lost product, a slow rate of loading will result in a thin layer of product spread over a relatively large area. Conversely, a rapid rate of hydrocarbon loading results in a thicker accumulation of product with less lateral spreading.

Daily inventory control would detect the loss of product that would be associated with a rapid rate of product loading long before the leakage was discovered by the ground water wells. Therefore, the only situation for concern is where a slow rate of loss is occurring. Given the wide lateral spreading associated with hydrocarbons on the water surface, a well spacing of 40 to 45 feet would provide a monitoring network as effective as the proposed 30 foot well spacing.

Thus, WOGA suggests that, at minimum, the second sentence of subsection 2646(e)(1) be amended as follows:

> "Additional borings shall be installed at closer angular spacings if the straight line distance between wells exceeds 30 feet, <u>or, if the tank contains hydrocarbons or is subject to daily inventory control, if the straight line distance between wells exceeds 40 feet or a greater distance as specified by the local agency</u>."

(3) <u>2646(e)(3)</u>

The requirement in this subsection for four-inch diameter casings is an unnecessary one. Ground water monitoring wells must be of sufficient diameter to allow for the easy withdrawal of ground water samples. Ground water samplers are commercially available in many sizes ranging from less than an inch to over several feet in diameter.

WOGA proposes that two-inch minimum inside-diameter cases be required for ground water monitoring wells. Both two-inch and four-inch diameter wells will detect the presence of contaminants. Moreover, the four-inch diameter well will, in many instances, be more difficult to properly install. A two-inch diameter well can be simply installed and the proper placement of a gravel pack for each well can be better assured with the use of two-inch diameter casing. Installing four-inch and larger wells would require excessively large diameter augers, with attendant operational problems.

(4) 2646(e)(4)

This subsection, requiring a minimum surface seal around a well casing, recognizes that such seals are needed to reduce the potential of surface leakage along the well bore and the native material. However, when the depth to ground water is very shallow (less than five feet below grade), the surface seal is less critical because other avenues for surface infiltration are readily available. In such situations, a surface seal of at least the thickness of the surrounding pavement, or if none exists, of 6 inches will provide adequate protection from surface infiltration. Moreover, if the requirement for a minimum surface seal is relaxed in this manner, the perforated interval of the well casing may be extended above the air-water interface. With a properly designed monitor well network, the ground water surface can then be visually monitored for the presence of such substances as free hydrocarbons.

Therefore, WOGA proposes the following changes for this subsection:

> "All wells should be provided with the minimum surface seal necessary to prevent infiltration of surface water. <u>In wells where the depth to groundwater is greater than 5 feet, the seal shall extend to a depth of at least 5 feet. Where the depth to groundwater is less than 5 feet, the surface seal shall be at least the thickness of the surrounding pavement or 6 inches, whichever is greater</u>."

(5) <u>2646(e)(5)</u>

This subsection, which would require pumps to draw down groundwater level 10 feet below the base of the surface seal, is both unnecessary and potentially counterproductive.

If, as WOGA suggests in its comments to subsection 2646(e)(4), the depth of the surface seal is reduced in cases where the depth to groundwater is less than five feet, no in-situ pumps will be necessary if the perforated interval of the well casing is extended to span the water table. As explained above, reducing the surface seal to the thickness of the surrounding pavement or to a depth of 6 inches, and then ensuring that the perforated interval spans the entire water table, should guarantee that the water in the well is representative of the entire water-bearing zone.

Requiring a pump capable of drawing down the groundwater level 10 feet below the base of the surface seal may not provide an accurate sampling of the ground water. At many locations, wells would be completed in a highly permeable water-bearing zone. In such zones, high pumping rates will be required to maintain the 10-foot drawdown below the top of the perforated interval. It is conceivable that a drawdown of 10 feet in the well may correspond to only a few inches of drawdown in the native material.

Moreover, before any discharge of ground water by a pump associated with a monitoring well, permits would most likely be required by city, county, water district or sewer treatment facility authorities. The time required to seek and obtain these permits could cause major delays in identifying leakage from a storage tank. In fact, the permits might not even be issued due to disputes over the water rights at the site.

In light of these concerns, WOGA believes that this subsection should be deleted as unnecessary and potentially counter-productive to the goal of early and effective leak detection.

(6) <u>2646(e)(6)</u>

As presently written, this subsection calls for the construction of monitoring wells without any regard for the presence of a perennial perched water table or a confining aquitard. Drilling a monitoring well to a level at least ten feet below the tank invert, and then perforating the well along its entire length, could provide a means for leaked material to migrate through the well and into the ground water.

WOGA believes that in cases where a competent aquitard and a perched water zone underlay the site of the proposed monitoring well, the well should end at the perched water and should not puncture the aquitard. As a matter of common sense, if the tank is leaking, product will show up in the perched water before it migrates to the ground water below. Similarly, if a competent aquitard underlays the regional water table, the well should extend only to that level so as to not puncture the aquitard. WOGA therefore suggests the following new language for section 2646(e)(6):

> "In the absence of any competent aquitard or perennial perched ground water zone underneath the tank, the ground water monitoring wells shall extend to an elevation that is at least 10 feet below the tank invert or to the ground water-air interface, whichever is the lesser. In the event a competent aquitard or perched ground water underlays the tank, the ground water monitoring well shall extend only to that aquitard or perennial perched water zone. The ground water monitoring well should not puncture a competent aquitard underlying the regional water table. The well shall be perforated at the air-water interface of the perched water or the ground water and at points above and below if necessary to account for any seasonal or other fluctuation of ground water levels."

(7) 2646(f)

The requirement in this subsection for weekly monitoring of ground water is unnecessary. In general, ground water flow rates are less than 100 feet per year through unconsolidated fine-to-medium-grained materials. Thus, on a monthly basis, the flow rate is less than 10 feet. Furthermore, many substances, including free hydrocarbons, move on the water surface at a much slower rate than the underlying groundwater.

Thus, taking the 100-feet-per-year flow rate as typical, substances in that water will have moved, at most, only a few feet during a one-month period. As previously discussed, free hydrocarbons will spread on the water surface radially away from the source of the leak. Therefore, the span of time in which the product will be clearly visible in the ground water monitoring well may be months or years. No real advantage is gained by requiring weekly testing. In those cases where the substance in the tank, the character of the underlying strata, and the actual ground water flow rate justify more frequent sampling, it could be required by the local agency.

Therefore, WOGA proposes the following changes in subsection 2646(f):

> "Ground water shall be monitored at least once per <u>month</u> from each well. More frequent monitoring may be required by the local agency <u>if it finds that more frequent monitoring is justified by the type of substance stored in a given tank, the character of the underlying strata, and the rate of groundwater flow beneath the tank</u>. Sampling and analysis, if applicable shall be according to Section 2648 of this article."

2647. Assurance Ground Water Monitoring

(2) 2647(b)(2)

This subsection exempts tank owners from implementing an assurance groundwater monitoring system if they can demonstrate that the highest groundwater level expected during the life of the UST is greater than 200 feet in depth. WOGA believes that the 200-foot figure is too deep to require the construction of ground water wells, because wells completed to these excessive depths would be ineffective in rapidly detecting a leak, and may in turn cause cross-contamination.

A large body of evidence suggests that the monitoring of ground water at depths greater than 30 feet below the tank invert is an ineffective method for early leak detection. At such depths, the lag between initial product leakage and the first appearances of the product at the ground water monitoring point may be months or years, depending on the character of the underlying sediment, the type of product stored and the rate of leakage. Moreover, standard drilling practices, such as augering, are ineffective and impractical at excessive depths. Actual depth limitations are dependent upon the drill rig used and the cohesiveness, degree of consolidation and grain size of underlying sediments. Often, these limiting factors are not known until the drill stem has been abandoned in place due to lack of sufficient torque and lifting capacity from the drill rig. The risk of such drill stem loss increases dramatically at increasing depths.

Thus, if the intention of subsection 2647(b)(2) is to exempt tank owners from installing ineffective ground water monitoring wells, WOGA suggests that the better approach would be to exempt the construction of such wells if the highest ground water level possible is expected to be deeper than 30 feet below the tank invert.

(2) <u>2647(b)(3)</u>

This subsection would exempt the drilling of ground water monitoring wells when physical obstacles prevent the positioning and operation of drilling equipment within 500 feet of a tank or tank cluster perimeter. WOGA proposes that in addition to this limitation, tank owners should be exempted if they cannot drill the wells on their own property. As a practical matter, adjoining property owners are highly unlikely to allow the disruptions attendant to the drilling of wells and the regular sampling of ground water. Therefore, WOGA proposes the following changes to the current subsection 2647(b)(2):

> "Proximity to physical obstacles prevents the positioning and operation of drilling equipment within a horizontal distance of 500 feet of the tank or tank cluster perimeter <u>or on the property of the tank owner or operator</u>."

(3) <u>2647(c)(1)</u>

WOGA believes that this subsection, which mandates the installation of ground water monitoring systems where the ground water depth is between 5 feet below the tank invert and 100 feet below the ground surface, should be deleted because it fails both to reflect the dictates of the enabling statute for these regulations and to provide for effective UST monitoring.

First, as explained earlier in these comments, the local agency, and not the state board, is the body mandated by the Legislature to determine which monitoring system shall be used in a given case. Health and Safety Code § 25284.1(b). As noted above, ground water monitoring is an alternative monitoring method only and the enabling statute does not require it for all existing tanks.

Second, as also explained above, ground water monitoring at depths greater than 30 feet below the tank invert is generally not the most effective method for early detection of product leakage. (<u>See</u> comment on subsection 2647(b)(2), above.)

Thus, WOGA suggests that this subsection be deleted from the proposed regulations.

(4) <u>2647(c)(2)</u>

WOGA's comments on this subsection are similar to those with respect to subsection 2647(c)(1). Where the highest anticipated ground water is at a depth greater than 100 feet, ground water monitoring well placement is generally ill-advised, both because of the difficulty of installation and the greater potential lag time between leakage and discovery. WOGA submits that this section is neither required by the statute nor advisable on technical grounds, and should therefore be deleted.

(5) 2647(d)

This subsection appears to assume that a determination of the depth to ground water in any given area cannot be established save through existing well data or the drilling of an exploratory boring. However, a trained professional should be able to determine with the desired accuracy the expected depth to groundwater based on the location and density of water wells, the regional geology and topography and the proximity of streams, lakes and vegetation cover.

If it is decided that ground water wells are not a desired monitoring mode for ground water depths greater than 30 feet below the tank invert, the importance of establishing whether ground water is at greater depths is unimportant.

WOGA therefore suggests the following new subsection 2647(d):

> "To establish accurately the depth of ground water under an underground storage tank facility, local agencies shall require documentation of the groundwater elevation utilizing existing wells within 500 feet of the facility, or as demonstrated by a certified professional. If an exploratory boring is constructed to determine ground water depth, it shall be constructed as follows:"

(6) 2647(d)(1)

As presently written, this subsection does not adequately define what is a "large area" for the purpose of drilling multiple exploratory wells. A more accurate definition would take into account the area described on the surface by the USTs. WOGA suggests the following changes in this subsection:

"An exploratory boring shall be drilled in the anticipated downgradient direction from the underground storage tank. More than one exploratory boring may be required where geohydrologic conditions are complex or where the surface area above the underground storage tank at a facility exceeds two acres."

(7) 2647(d)(5)

As WOGA has commented above, ground water monitoring is not a feasible or desirable early leak detection alternative when the groundwater depth exceeds 30 feet below the tank invert. Thus, this subsection, which calls for exploratory borings to be drilled to a minimum depth of 200 feet if ground water is not encountered at that depth, is unnecessary. WOGA recommends that this subsection be amended as follows:

"The exploratory boring shall be drilled to a depth of 30 feet below the tank invert if ground water is not encountered at a depth of less than 30 feet below the tank invert."

(8) 2647(d)(6)(A)

As WOGA has discussed, ground water monitoring should not be required where the depth to ground water is greater than 30 feet below the tank invert. In addition, as WOGA has also previously noted, 2-inch diameter casing is sufficient for monitoring wells with regard both to efficiency and ease of installation. Thus, WOGA proposes that this subsection be modified to require an exploratory boring to be converted to a ground water monitoring well if ground water is encountered within 30 feet below the tank invert, and to allow the use of 2-inch ID casing for a well conversion.

(9) <u>2647(d)(6)(B)</u>

This subsection, which establishes both the depth and degree of perforation of exploratory wells, does not currently account for the presence of competent aquitards underlying a tank. As WOGA has commented previously, placing a well through a competent aquitard and perforating the well through essentially its entire length, could result in the vertical communication of fluid between distinct water-bearing zones. Shallow contamination could short-circuit the detection system and contaminate deeper water-bearing zones. Thus, WOGA recommends that this subsection be rewritten to provide for perforation of the exploratory well only from some point above the air-water interface (to allow for seasonal ground water variations) to a point either 10 feet below the historical low ground water level or to the top of a competent aquitard.

(10) <u>2647(d)(6)(C)</u>

This subsection, calling for ground water monitoring of a confined aquifer, is unnecessary and counterproductive with respect to wells for tanks containing hydrocarbons. In the case of a truly confined aquifer, hydrocarbons will be detected on the perched zone above the uppermost confining aquitard. The overlying perched water zone above this aquitard or the vadose zone immediately adjacent to the tanks should be the area for monitoring.

Thus, WOGA proposes that the following sentence be added to this section:

"This section does not apply to monitoring systems installed for tanks containing hydrocarbon products."

(11) 2647(d)(7)

As previously discussed, no exploratory boring should be required at depths below 30 feet below the tank invert. Thus, this subsection should be amended to require backfilling and sealing of exploratory wells if the boring does not reveal ground water within a depth of 30 feet below the tank invert.

(12) 2647(e)

While this subsection recognizes that well samples should represent the ground water being tested, it fails to provide an adequate methodology to attain this end. For example, when saltwater is present, ground water pH, specific conductivity or temperature may not stabilize during pre-collection pumping. Therefore, it is reasonable to expect possible variations in these chemical parameters during pumping.

If the intended purpose of this subsection is to ensure that representative ground water samples are used, WOGA suggests that the better method would be to follow the U.S. Environmental Protection Agency's practice of pumping from 4 to 10 well volumes before sampling is conducted. The procedures and methods of ground water sampling are extensively discussed in Fenn, et al., (1977),[1/] Scalf, et al., (1982),[2/] and Geo Trans, Inc., (1983, Draft). We suggest the following changes in this subsection:

> "Wells should be sampled semi-annually at a minimum. More frequent sampling may be required by the local agency. Samples shall be taken after sufficient volumes of water have been removed from the well pursuant to the procedures set forth in Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, Document SW-611, pp. 20-21 (Environmental Protection Agency, 1977). Sampling equipment shall not donate, capture, mask or alter the sample constitutents."

2648. Well Construction and Sampling Methods

(1) 2648(a)

While WOGA agrees that sampling equipment and materials must not affect the results of the sampling, this subsection, as presently worded, could prohibit the use of excellent and perfectly acceptable materials. Recent research indicates that certain well casing materials such as poly-vinyl chloride ("PVC"), polyethylene ("PE"), and polypropylene ("PP"), may emit or absorb very low levels of certain organic

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1/ Fenn, D., E. Cocozza, S. Isbister, O. Braids, B. Yare, and P. Roux, 1977, Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Facilities, EPA/530/SW-611, U.S. Environmental Protection Agency, Cincinnati.

2/ Scalf, M. R., S. F. McNabb, W. I. Dunlap, R. L. Cosby, and I. Frybenber, 1981, Manual of Ground-Water Quality Sampling Procedures, NWWA/EPA Series Robert S. Kerr Environmental Research Lab, U.S. Environmental Protection Agency, Ada, Ok.

compounds and trace metals. These emitted or absorbed compounds would not affect ground water samples to the point of masking possible ground water contamination. If hydrocarbons are present on the groundwater surface, the miniscule effects attributable to the casing materials would not interfere with the analysis of the ground water for the constituents stored in the tanks. Therefore, this subsection should include a sentence allowing the use of PVC, PE and PP casings for monitoring walls at hydrocarbon storage facilities.

(2) 2648(c)

As presently worded, this subsection would force unnecessary equipment cleanings. For example, if drilling equipment is washed after its use at one location and then the same equipment is used 15 minutes later at another site, it would have to be washed yet again under the present wording of this section. A simple requirement that the equipment be washed immediately before a boring is started would encompass all situations and would effectively prevent cross-contamination between borings at storage facilities.

(3) 2648(g)

This subsection is unnecessary to ensure proper ground water monitoring because the processes used in manufacturing or processing all materials eliminates or reduces to negligible amount any volatile compounds. Thus, WOGA suggests that a sentence be added to this section reading:

> "This section is not applicable to wells for tanks containing hydrocarbons."

Article 5

2650. Applicability

In subsection (d), the word "immediate" is vague and should be deleted.

2651. Unauthorized Release Requiring Recording

In subsection (a) a recordable release is defined, among other things, as an unauthorized release that is contained by the secondary container. Accordingly, in subsection (b), the words "shall be contained" should be deleted as redundant. Also, in subsection (b), the requirement to provide information on the cost of clean-up should be deleted. This information is not required by the statute and is irrelevant. Subsection (b)(3) should be deleted because this information is routinely sent to the Department of Health Services, as is a copy of the hazardous waste manifest. To require that this information also be provided to the Board exceeds the Board's authority, is unnecessary and only increases the already substantial paperwork requirements which are especially difficult for small businesses.

2652. Unauthorized Release Requiring Immediate Reporting

The word "immediate" in the section heading is vague and should be deleted. The requirement in subsection (a)(1)(B) that an unauthorized release is reportable if the hazard of fire or explosion increases exceeds the Board's authority under the statute to protect ground water quality and should be deleted. In subsection (b), unauthorized releases set forth in (a) must be reported within 24 hours after the release has been detected or "should have been detected." This requirement is meaningless because one cannot report an undetected release. Also, the requirements to provide information regarding the cost of clean-up method and location of disposal and to provide copies of manifests should be deleted for the reasons stated in our comments on section 2651.

Article 6

2661. Repair Evaluation

For purposes of clarity, subsections (c)(1) through (3) should be deleted and subsection (c) should be changed to read:

> "If interior lining is the proposed repair method, the suitable criteria described in API recommended practice 1641 must be met."

This would conform to the approach taken in subsection 2662(b).

2663. Primary Container Monitoring

In subsection (a), reference is made to the Flammable and Combustible Liquids Code adopted by the National Fire Protection Association, specifically NFPA 30-1981. This code was reratified in 1984 as NFPA 30-A. To recognize the fact that these codes are changed from time to time, we suggest that the reference be to the "latest edition of the Flammable and Combustible Liquids Code." The same comment also applies to subsection (b).

Article 7

2670. Applicability

In subsection (e), the word "waste" in the first line should be substituted with the words "hazardous materials." This appears to have been an error. With regard to subsection (f), we suggest deleting the requirement that 45 days prior to the cessation of storage of hazardous materials a proposal be submitted describing how the owner intends to comply with the closure requirements. This much advance notice is not necessary and may, in some circumstances, be impossible to provide. WOGA asks that the Board leave the timing of the advance notice up to the local agency.

2671. Temporary Closure

In subsection (b)(4), for safety purposes, we suggest adding the following language:

> "(4) Except for required venting, all fill and access locations and piping shall be sealed utilizing locked caps or concrete plugs."

2672. Permanent Closure Requirements

The hazardous waste requirements in subsection (b) for the disposition of underground storage tanks and their contents are beyond the Board's statutory authority and will be covered by the hazardous waste management regulations currently being adopted by the Department of Health Services. We suggest deleting sections (b)(1), (3), (4) and (5) and amending subsection (b) as follows:

"Removal of underground storage tanks shall comply with applicable Health and Safety Code Sections, include Section 25245-25249, and the hazardous waste regulations found at ___ Cal. Admin. Code _________."

(The citations to the California Administrative Code should be left blank until the hazardous waste management regulations proposed by the Department of Health Services are adopted.)

Subsection (c) is also covered by the hazardous waste regulations presently being considered by the Department of Health Services for storage tank closure. Therefore, subsections (c)(1) and (2) should be deleted.

With regard to subsection (d), ongoing leak detection monitoring should not be needed if the tank has been properly cleaned. Therefore, we suggest that the word "ongoing" be deleted.

Article 8

2681. Categorical Variance

(1) 2681(b)(6)

This subsection requires a flat fee of $26,000 to accompany any application for a categorical variance. WOGA understands that an application fee is generally set to cover administrative expenses associated with processing an application. However, in some cases a categorical variance application may not incur the full $26,000 processing costs. We suggest that the Board require a cash deposit of $26,000 and, if processing costs turn out to be less than $26,000, that difference can be refunded to the applicant.

This same comment applies to the fee for a site-specific variance application in subsection 2682(e)(6), and the local agency application for additional standards in subsection 2691(a)(4).

2682. Site Specific Variance

(1) 2682(g)

The second to last sentence in this subsection appears to contain a typographical error. The section covers site-specific variances yet the language in the subsection refers to "a description of the proposed categorical variance." This should be "a description of the proposed site-specific variance."

Article 10

2711. Permit Application and Information

(1) 2711(b)

This subsection enumerates the information which is required in a permit application. Much of this information will have already been submitted by the owner or operator of the UST on the hazardous substance storage statement required by Cal. Water Code § 13173. For example, items (1)-(6) and (9)-(11) in proposed subsection 2711(b) can be found in the statement. WOGA suggests that for those persons who have already submitted a hazardous substance storage statement, the information in subsection 2711(b)(7)-(8) is all that should be required.

2712. Permit Conditions

(1) 2712(f)

This subsection establishes a provisional permit for those USTs which do "not completely conform with Articles 3 or 4 of this subdivision." However, these provisional permits are to be issued for no longer than three months without the possibility for extension or renewal. It is simply unrealistic to assume that efforts to bring nonconforming tanks up to the standards in the regulations will, in all cases, take no more than three months. It is also unrealistic to assume that local agencies will have the resources to inspect each nonconforming tank within 15 days of the expiration of the provisional permit. We ask that the Board allow the local agency the discretion to extend the provisional permit every three months for up to one year. The one-year limit will assure that provisional permits are not used as operating permits and the periodic renewal will give the local agency the ability to retire a permit if the owner or operator takes no action to bring the tank into conformance with the regulations.

87

ALTERNATIVE MONITORING PLAN

FOR UNDERGROUND STORAGE TANKS
CONTAINING MOTOR VEHICLE FUELS AND LUBRICANTS

PROPOSED BY
HARDING LAWSON ASSOCIATES

FOR
WESTERN OIL AND GAS ASSOCIATION

ALTERNATIVE MONITORING PLAN

FOR UNDERGROUND STORAGE TANKS
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INTRODUCTION

This alternative monitoring plan is submitted to provide guidelines for underground storage tanks containing motor vehicle fuels and lubricants. The alternative plan is needed because the physical requirements for detecting motor fuels and lubricants are significantly different from those for other hazardous compounds such as solvents. The following properties of motor fuels and lubricants are sufficiently characteristic to justify separate regulatory requirements:

- Density. Most motor fuel and hydrocarbon products are less dense than water and thus can be detected at the top of the uppermost aquifer.

- Miscibility. Most fuel and lubricant products are insoluble in water and will usually exist as a separate phase.

- Volatility. Significant fractions of motor fuels, particularly gasoline, have high vapor pressures that result in their volatization in the vadose zone.

These properties allow monitoring installations in both the vadose and saturated zones that can be effective in leak detection with different requirements than installations required to detect other products.

Section 2644. Soil Testing and Exploratory Boring.

PURPOSE: To determine if current usage of the tank or tanks is resulting in a significant release of materials that presently are contained in the tanks.

a. Gasoline or Diesel Fuel Tanks:
One vertical boring per tank shall be drilled within 10 feet of the tank excavation. For tanks in a cluster, the borings shall be equally distributed around the cluster. For single tanks, a minimum of two borings shall be drilled. The borings shall extend to the shallowest perennial ground water, to a depth of 30 feet below the tank invert, or to unweathered, competent bedrock, whichever is less.

b. Waste Oil Tanks:
One vertical boring shall be drilled within 10 feet of the tank excavation. The boring shall extend to the shallowest perennial ground water, to a depth of 10 feet below the tank invert, or to unweathered, competent bedrock, whichever is less.

c. Soil samples shall be obtained from the borings at vertical intervals of no more than 5 feet, beginning at the level of the tank invert. Samples shall be taken using methods that permit determination of the sampled interval to within one foot or less.

d. All borings shall be logged in detail and described using the Unified Soil Classification System. Evidence of soil contamination determined by visual or any other means shall be recorded on the log. All sampling and logging shall be performed by an appropriately trained professional working under the supervision of a registered geologist, civil engineer, or certified hydrogeologist.

e. Exploratory borings shall be drilled and sampled by techniques that do not introduce liquids of any type into the borehole.

f. All downhole drilling equipment shall be adequately cleaned before starting each exploratory boring to prevent cross-contamination.

g. All downhole soil and water sampling equipment shall be adequately cleaned before each sample is taken to prevent cross-contamination.

h. The location of all exploratory borings relative to a permanent reference location shall be measured to the nearest foot.

i. The elevation of the land surface relative to a permanent reference datum shall be determined to the nearest foot at each exploratory boring.

j. Exploratory borings may be used for construction of monitoring wells as described in Section 2646, or for emplacing vadose zone monitoring devices. All exploratory borings not used to emplace vadose zone monitoring devices or groundwater monitoring wells shall be properly abandoned by sealing from the bottom of the boring to the land surface with bentonite or cement grout.

Section 2645. Vadose Zone Detection Monitoring.

PURPOSE: To detect leaks in the vadose zone above the perennial ground water level.

a. Vadose zone monitoring shall be implemented where the depth to perennial groundwater below the tank invert is always greater than 5 feet.

b. At least one vadose zone monitoring access point for each tank shall be installed no more than 5 feet laterally from the edge of the backfill for each excavation. The detection portion of each device shall be located at the base of the tank back-fill, or in native materials at a depth of no more than 5 feet below the tank invert.

c. Sampling or detection measuring of vadose zone monitoring devices shall be performed monthly.

d. Vadose monitoring devices or methods include both those that directly sample pore liquids and/or vapors, and those that detect the presence of leaked materials via changes in physical and/or chemical properties of the vadose zone above ambient or background levels. The monitoring device or method must be capable of detecting the material(s) stored in the tank(s).

e. Vadose zone monitoring installation

1. All device construction materials shall be compatible with the material stored in the tank(s), and shall not leach, capture, mask, or alter the chemicals used to detect leakage.

2. Initial borings referred to in Section 2644, which have been installed with drilling techniques that permit the detection of perched zones and the depth to perennial ground water, will be used to determine the location of the detection devices.

3. All boreholes or other excavations used to provide access for vadose zone monitoring devices will be properly sealed to prevent infiltration of liquids from the land surface.

4. All vadose monitoring installations will be completed at or above the land surface to provide the following:

   - Prevention of accidental damage and unauthorized access

   - Prevention of surface water entry.

5. All vadose monitoring installations shall be properly identified by affixing permanent markers to the inside of the surface protective housing. The following information shall be included on the marker:

- Identification number

- Depth to top and bottom of monitored zone.

6. All vadose monitoring installations shall have a marker affixed to the exterior of the surface protective housing that includes the identification number.

Section 2646. Ground-Water Leak Detection Monitoring.

PURPOSE: To monitor for leaks where the depth to perennial groundwater is less than 30 feet below the tank invert.

a. Ground-water monitoring shall be used as the primary leak detection method where the depth to perennial ground water is less than 30 feet below the tank invert.

b. Definition: "Downgradient" means in the direction toward which groundwater will move. This direction shall be determined by the professional judgment of a registered geologist, civil engineer, or certified hydrogeologist.

c. Definition: "Tank cluster" means more than one tank emplaced in a single excavation.

d. Monitoring well coverage shall be as follows:

1. Installations where the shallowest seasonal or temporary depth to perennial groundwater is less than 5 feet below the tank invert.

- Single tanks: one well installed on the down gradient side.

- Multiple tanks: one well per tank, equally distributed around the perimeter of the tank cluster. At least one well shall be located downgradient of the cluster.

2. Installations where the shallowest seasonal or temporary depth to perennial ground water is between 5 and 30 feet below the tank invert:

- Single tanks with a capacity greater than 1000 U.S. gallons: at least two wells installed, one of which shall be on the downgradient side of the tank.

- Single tanks with a capacity less than 1000 U.S. gallons: one well placed on the estimated downgradient side of the tank.

- Multiple tanks: one well per tank, uniformly distributed around the perimeter of the cluster. At least one of the wells shall be on the downgradient side of the cluster.

3. For installations where the depth to perennial ground water is greater than 30 feet below the tank invert, ground-water monitoring wells are not required. In these cases, vadose zone monitoring devices or methods shall be installed according to Section 2645.

e. Monitoring well installation:

1. All well construction materials shall be compatible with the material stored in the tank(s), and shall not significantly

leach, adsorb, mask, or otherwise alter the chemicals used to detect leakage.

2. Initial borings referred to in Section 2644, which have been installed with drilling techniques that permit the detection of perched zones, and the depth to perennial ground water, will be used to determine the screened interval.

3. If drilling methods are used to complete monitoring wells below the perennial ground-water level that involve the use of drilling fluids, the following restrictions apply:

   - Drilling fluid additives shall be limited to non-hazardous materials which conform to the requirements of Subsection 2646 e.1.

   - The depth(s) at which such additives are used shall be recorded on the log of the boring or well.

   - Samples of drilling fluid additives shall be retained for possible chemical analysis.

4. All downhole drilling equipment shall be adequately cleaned before starting each exploratory boring to prevent cross-contamination.

5. All downhole soil and water sampling equipment shall be adequately cleaned before each sample is taken to prevent cross-contamination.

6. All monitoring wells shall be constructed with a casing having a minimum inside diameter of two (2) inches.

7. All ground-water monitoring wells shall extend to a minimum of 10 feet below the lowest anticipated perennial ground water level, or to a competent aquitard, whichever is shallowest.

8. Wells shall have an appropriate factory-fabricated well screen or perforations. The screening or perforations shall extend from the bottom to 10 feet above the highest anticipated seasonal water level; or to the level of the tank invert, whichever is shallowest.

9. Wells shall have a bottom cap.

10. Wells shall be sealed from no more than 2 feet above the top of the well screen or perforations to the land surface. Seals shall comprise bentonite or cement grout.

11. All imported materials used to construct monitoring wells shall be evaluated to determine their acceptability with regard to Subsection 2646 e.1.

12. Samples of cement, bentonite, gravel pack, and other sealing materials shall be retained for 30 days for possible chemical analysis. The source of all well construction materials will be documented.

13. All well casing, casing fittings, screens, and other well construction materials shall be thoroughly cleaned in a manner to remove contamination before subsurface installation.

14. All monitoring wells shall be properly and adequately developed.

15. All wells will be completed at or above the land surface to provide the following:

    - Prevention of accidental damage and unauthorized access

    - Prevention of surface water entry to the well.

16. All wells shall be properly identified by affixing permanent markers to the inside of the surface protective housing. The following information shall be included on the marker:

    - Well identification number

    - Well depth

    - Depth to top and bottom of perforations or screen(s).

17. All wells shall have a marker affixed to the exterior of the surface protective housing that includes the identification number and well type.

18. The location of all monitoring wells relative to a permanent reference location shall be measured to the nearest foot.

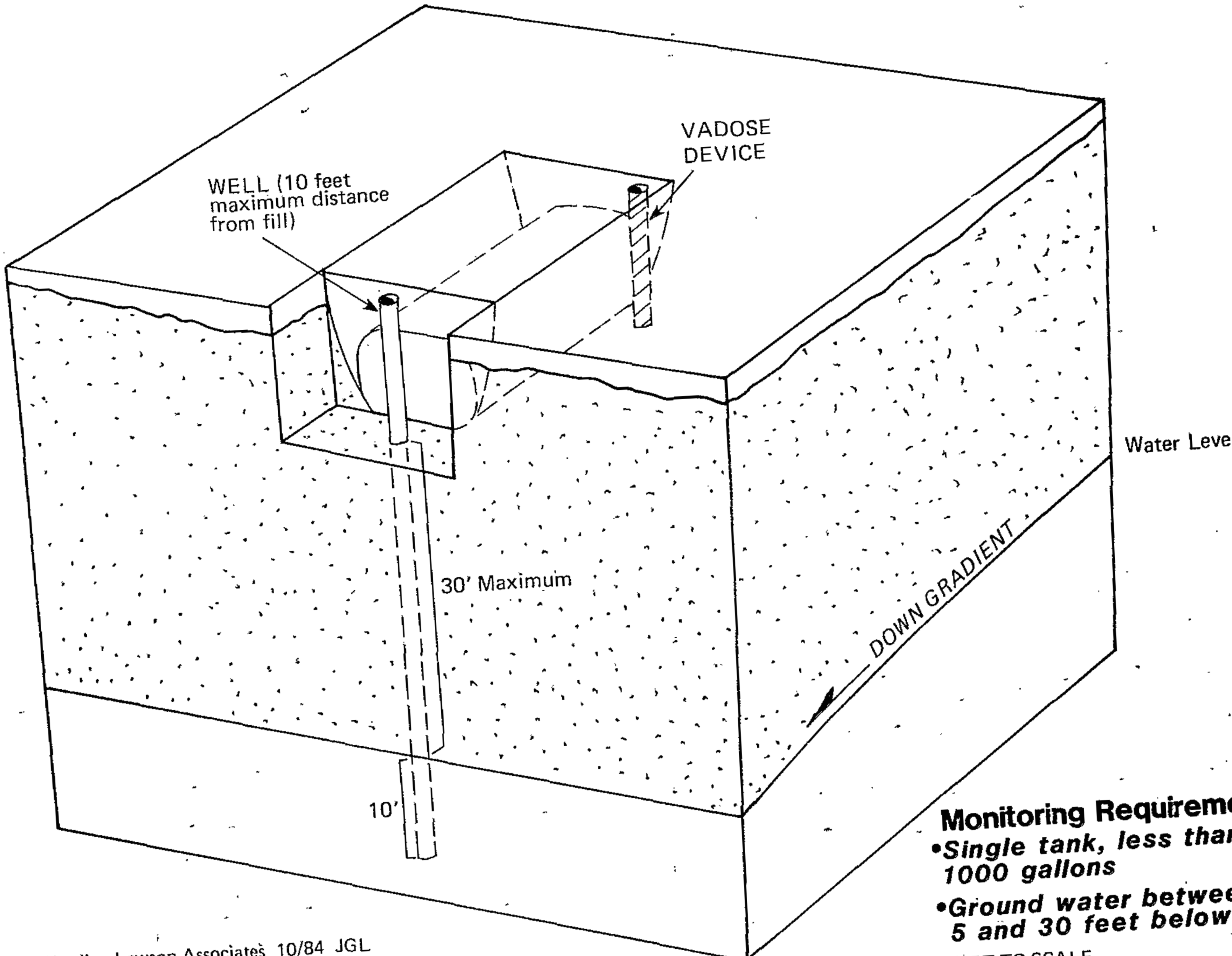
19. The elevation of a marked, distinct measuring point for each well shall be determined to the nearest .01 foot at each ground-water monitoring well.

f. Monitoring wells shall be checked monthly for the presence of product. Monitoring shall be by sampling accomplished in a manner that permits visual examination of the undisturbed interface between air and liquid in the well. The results of each monitoring episode shall be recorded on a data sheet to be kept at the facility. At a minimum, the following shall be recorded for each sampling episode:

   - Date and time of sampling

   - Depth to air/liquid interface to the nearest one half (6 inches) of a foot

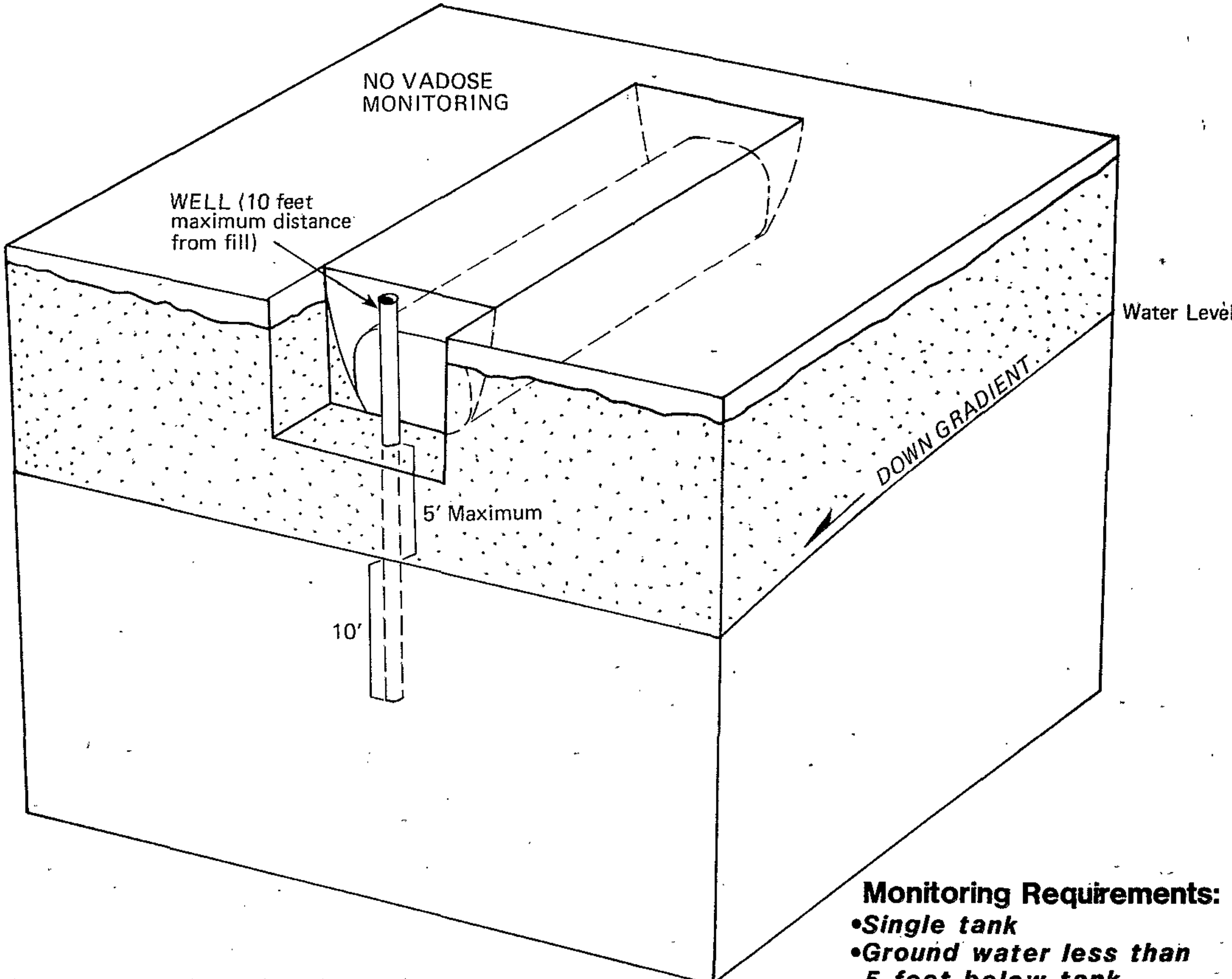
- Thickness of any product present to the nearest ¼ inch,
- Presence or absence of an organic sheen on the water surface
- Presence of odors
- Name and signature of person responsible for sampling.



Monitoring Requirements:
- ***Single tank, less than 1000 gallons***
- ***Ground water between 5 and 30 feet below tank***

NOT TO SCALE

Harding Lawson Associates 10/84 JGL



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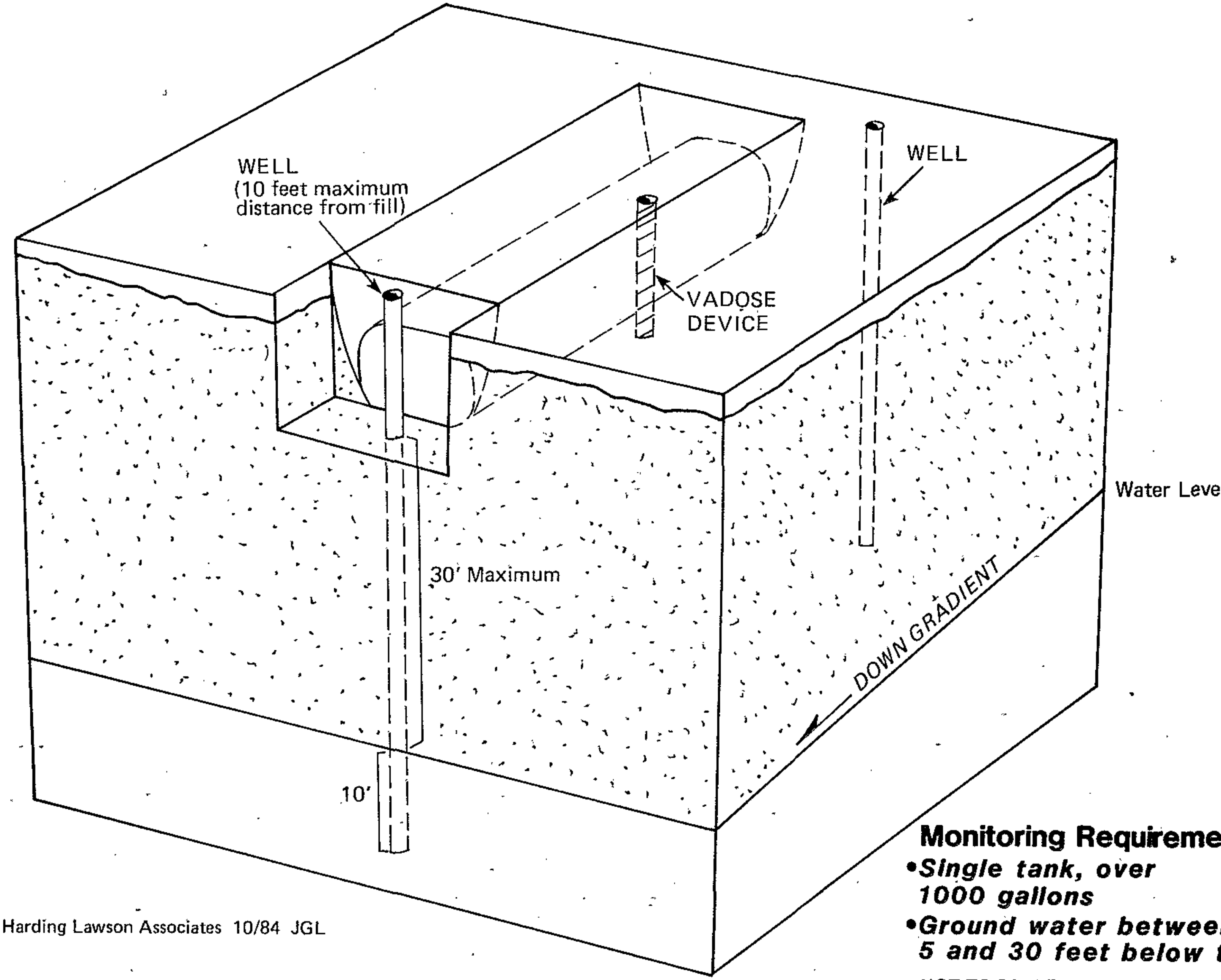
Monitoring Requirements:

- ***Single tank***
- ***Ground water less than 5 feet below tank***

NOT TO SCALE



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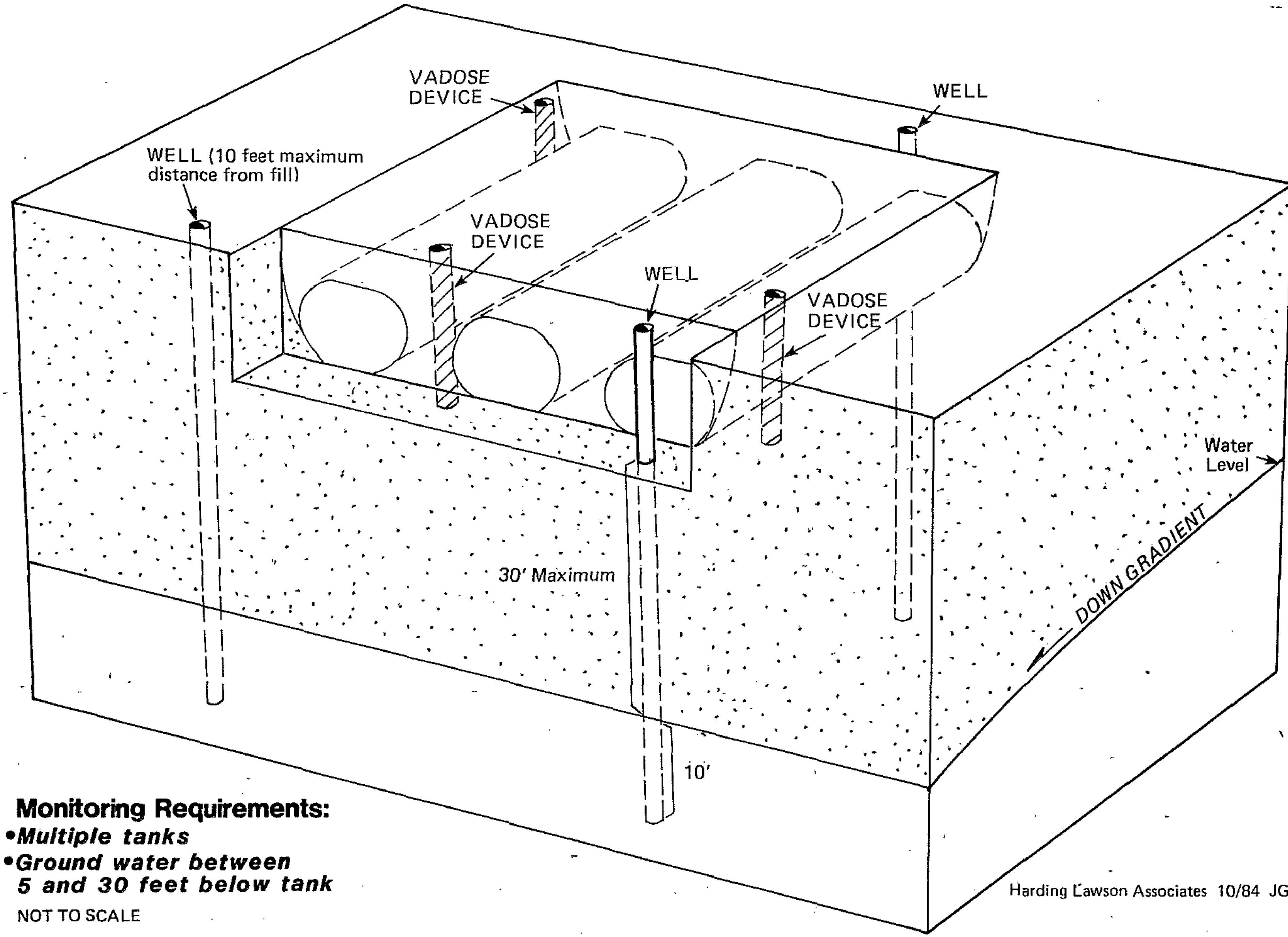
Monitoring Requirements:

- ***Single tank, over 1000 gallons***
- ***Ground water between 5 and 30 feet below tank***

NOT TO SCALE



Monitoring Requirements:

- ***Multiple tanks***
- ***Ground water between 5 and 30 feet below tank***

NOT TO SCALE

Harding Lawson Associates 10/84 JGL

RATIONALE FOR

ALTERNATIVE MONITORING PLAN

FOR UNDERGROUND STORAGE TANKS
CONTAINING MOTOR VEHICLE FUELS AND LUBRICANTS

PROPOSED BY
HARDING LAWSON ASSOCIATES

FOR
WESTERN OIL AND GAS ASSOCIATION

Section 2644

a. 1. ' . . . 10 feet from excavation . . . ': Boring should be as close as possible to optimize its detection capability. However, borings generally should not be drilled through the tank excavation backfill to prevent damage to geotextiles at the fill/native soil interface.

2. ' . . . minimum of 2 borings . . . ': At least two borings are required per excavation because the location of the deepest part of the excavation is not generally known. Lost product may collect in the low point. Two borings provide increased detection ability.

3. ' . . . 30 feet below invert . . . ': The depth of 30 feet is based upon the theoretical maximum penetration of a 500 U.S. gallon leak which ponds on an area equal to one half of the tank 'footprint', and which penetrates a uniform fine sand or silt without secondary permeability. Computation method and values for specific retention of gasoline in fine sand and silt are based upon research documented in report by CONCAWE, April, 1979 (copy of referenced page attached as Appendix A).

4. ' . . . vertical borings . . . ': Vertical borings, emplaced laterally as described herein should be as or more effective than slant borings for the following reasons:

- Horizontal, or predominantly horizontal stratification at many scales exists in natural sedimentary deposits. This stratification results in lateral fluid conductivity being greater than vertical fluid conductivity from several times to as much as an order of magnitude. This anisotropy in fluid conductivity results in lateral spreading of liquid product as it travels through the vadose zone. In the case where the moisture content of some strata is high, lateral spreading of hydrocarbon products may be accelerated because water preferentially wets the solid grains, providing a smaller effective porosity through which the product may move.

- The same anisotropy in permeability applies to preferential diffusion and advection of gas or vapor phase product that are required to permit detection. Because gaseous diffusion is not significantly affected by gravity, it will occur most rapidly in the direction of the highest air-filled effective porosity. This direction is in the direction of the highest permeability.

- Therefore, there is no assurance that slant borings designed to intersect a plumb line beneath the tank will be any more effective, or in fact as effective, as the vertical borings distributed as described in this alternative plan.

b. 1. Same as a.1

2. ' . . . 10 feet below tank invert . . . ': Same rationale as a.3, but computations for a 50 gallon loss (10 percent of typical waste oil tank volume), and using oil as the liquid.

c. The 5 foot sampling interval is standard in the geotechnical industry, and is the minimum required to determine subsurface lithologic sequences.

d. To specify that a registered civil engineer, registered geologist, or certified engineering geologist log borings is not required, as major decisions will not be based only upon field observations. It is industry practice for the routine logging of subsurface lithologies and identification of perched and perennial ground-water zones to be accomplished by non-registered engineers, geologists, hydrogeologists, and soil scientists under the direction of registered or certified professionals. Decisions regarding the selection of monitoring zones and devices are made by the responsible certified or registered professionals. Therefore, the requirement should be that a registered or certified professional be responsible for the selection of monitoring devices and zones, and for assuring that the installations have been correctly constructed.

e. Liquids should not be introduced so that perched and perennial ground-water zones may be detected, and so the moisture status of the vadose zone can be assessed to properly design vadose zone monitoring devices.

f, g. Self-explanatory.

h. The boring locations should be determined so that they may be relocated at later dates, and to aid in evaluating lateral lithologic changes.

i. The elevation of the ground surface is needed to aid in determining lateral continuity of subsurface lithologies.

j. Self-explanatory.

Section 2645

a. Vadose monitoring will not be required in cases where water levels are always shallower than five (5) feet below the tank invert because ground-water monitoring will be in effect. The additional 'early warning' provided by vadose zone monitoring devices in this case will generally be ineffective because:

- For coarse-grained materials, the travel time to shallow ground water will be rapid enough to permit detection by the ground-water system. In this case, vertical transport over small areas is usual, and a point detection device will have a small chance of detecting the leak.

- For fine-grained soils, the height of capillary rise may approach or exceed 5 feet, and the vadose zone devices that rely upon the presence of a gas phase will not work.

b. Monitoring devices should be as close to the edge of the excavation as possible, but should not penetrate the backfill so as not to damage any geotextiles emplaced at the fill/native soil interface. For cases where the monitoring device relies on vapor-phase detection, the device should be emplaced in the back-fill material without penetrating any geotextiles. The backfill generally has a higher permeability to air and higher gas-phase diffusion coefficients than native soil. Therefore, the detection capability will be higher with the detection devices emplaced in the backfill.

For cases where the monitoring device relies upon liquid or liquid and vapor detection, and if emplacement can be accomplished through the bottom of the excavation without disturbing any geotextiles beyond the diameter of the access boring, vadose monitoring devices should be placed as close to the 'footprint' of each tank as possible.

The depth of 5 feet below the base of the backfill is used because devices emplaced deeper will not be as effective in detecting leaks. For liquid detection systems, the detection capability is enhanced by the amount of liquid present. Because a certain fraction of product is retained against the influence of gravity, significant leaks could go undetected if the detector were more distant from the fill/native soil interface. Because vapors must move to vapor or gas-phase detectors by gaseous diffusion and/or gas-phase advection, detection capability is enhanced by the proximity of the detector to the source of product.

Vadose monitoring devices or methods that rely on the spatial integration of some physical or chemical property of the vadose zone should be emplaced in a manner to maximize the detection capability. In these cases, the upper level of detection should be no deeper than 5 feet below the base of the excavation.

c. Monthly sampling is adequate because these devices are intended to be the primary means of detection for leaks that are not detected by enforced inventory, and that are therefore generally constant, and of a low flow rate. The monthly sampling and/or device readings should be analyzed using statistical trend analysis methods to minimize the interference from measurement and/or detection error.

d. The state of the art in vadose monitoring is not sufficient to specify a particular methodology. Consequently, the provision should be made for a wide range of presently available and future technologies. The burden of proof of applicability is intended to be taken in the context of best available technology.

e. Self-explanatory.

Section 2646

a. ' . . . less than 30 feet . . . ': Same rationale as Section 2644.

b. Self-explanatory.

c. Self-explanatory.

d. 1. If ground water is shallow, product will accumulate rapidly on the top of the zone of saturation, thus affording little chance for lateral migration. Therefore, one down-gradient well is adequate. Multiple tanks require more wells because of the larger areal extent of the backfilled excavation.

   2. Two wells are required to allow for uncertainty caused by lateral spreading of product as it traverses the vadose zone. Waste oil tanks are small, and two wells emplaced within the lateral limits stated herein would be redundent.

   3. Vadose zone monitoring and enforced inventory control will detect leaks before 30 feet of penetration.

e. 1-5 Self-explanatory.

   6. Two-inch diameter wells are sufficient to check for the presence of hydrocarbons at the depth to which wells will be installed under this alternative plan. The materials expense and the unavailability of sufficient equipment to adequately and accurately install larger wells precludes their installation.

   7. Completion of wells ten (10) feet below the lowest seasonal water level is adequate because hydrocarbon fuel products are less dense than water, and thus will be found on top of the free water surface in monitoring wells.

   8. Ten feet of well screen above the highest water level assumes that the capillary fringe on top of which product will perch is less than ten feet thick. This is a reasonable assumption for all but extremely tight clays.

   9. Bottom caps prevent inflow of sand or gravel pack or native soil into well.

   10. Prevents grout from entering well screen.

   11. Self-explanatory.

   12. Samples only need to be retained for a short time because any questions regarding these as a source of contamination usually manifest themselves during sampling immediately following well construction.

APPENDIX A

concawe

report nr. 3/79

protection of groundwater from oil pollution

Prepared by CONCAWE's Water Pollution
Special Task Force No. 11

T.L. de Pastrovich

Y. Baradat
R. Barthel
A. Chiarelli
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threshold below which it is no longer able to move). It is a non-dimensional parameter, and can be expressed as retention capacity R.

In the retention zone, three phases are present: oil, air, water. The mobility of these three phases will depend on their respective proportions in the pores.

The maximum depth of penetration can be estimated from the following formula (Reference 9):

$$D = \frac{1000\ V}{A \times R \times k}$$

where D = Maximum depth of penetration, m
V = Volume of infiltration oil, m^3
A = Area of infiltration at surface, m^2
R = Retention capacity of soil, in litres per cubic metre (l/m^3)

"k" is an approximate correction factor for various oil viscosities

k = 0.5 for low viscosity petroleum products, e.g. gasoline
k = 1.0 for kerosine, gasoil and products with similar viscosities
k = 2 for more viscous oils such as light fuel oil.

Typical values for retention capacities of porous soils are given below (Reference 9):

Typical Values for Retention Capacities of Porous Soils are given below (ref. 9)

Soil	R Oil Retention Capacity l/m^3
Stone, coarse gravel	5
Gravel, coarse sand	8
Coarse sand, mdium sand	15
Medium sand, fine sand	25
Fine sand, silt	40

As an example, consider 1 m^3 of kerosine infiltrating over a 10 m^2 area. The maximum final depth of penetration will be 20 m for a soil composed of stones and coarse gravel. This is reduced to a maximum of 6.7 m for coarse to medium sand and only 2.5 m for fine sand to silt type soils.

The values of R given above are for porous soils with a natural moisture content. The retention capacity is increased for dry soils. If the soil consists of layers with different retention capacities, an intermediate value for R must be selected. In general, the existence of soil layers of different compositions

Fig. 10 Possible migration to outcrops (ref.1)

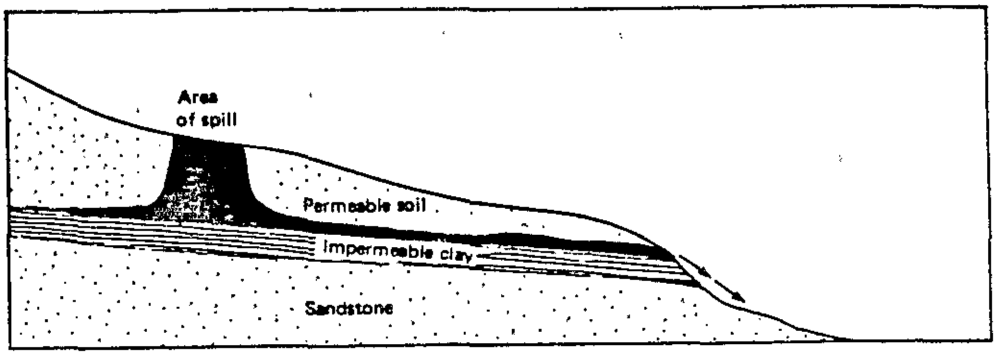


Fig. 11 Body of petroleum products having reached the water table (ref.36, 41)

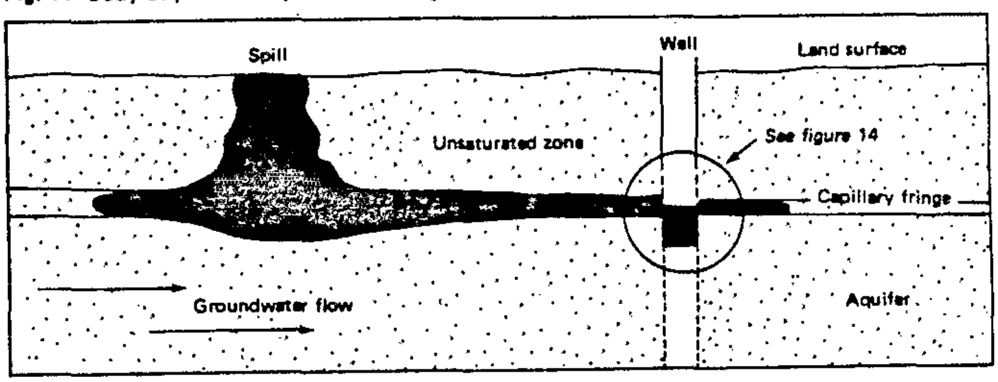
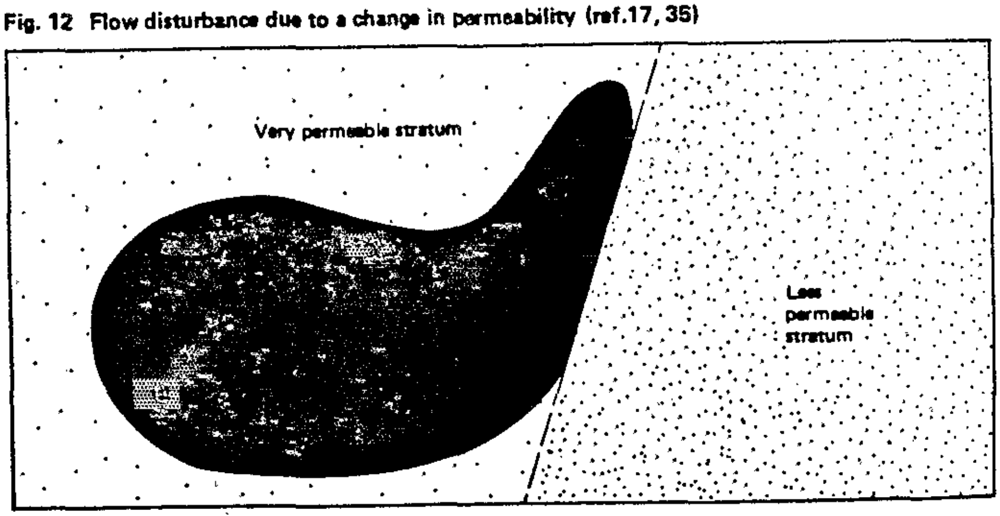


Fig. 12 Flow disturbance due to a change in permeability (ref.17, 35)



increases the retention capacity. In practice, because soils are not homogeneous, the actual spreading pattern is very irregular with less downward penetration than is predicted by theoretical calculations.

The formula above gives only a very rough approximation of the spread of pollution in the event of an accident. Its application calls for knowledge of the volumes of oil discharged as well as of the structure of the subsoil. Furthermore, assumptions are made concerning the values ascribed to the factors k and R.

Any continuous impermeable layer is able to arrest the vertical movement of oil. When the oil encounters such a layer, it will migrate laterally until the threshold of residual saturation is reached, or until it reaches a discharge point (Figure 10).

If the depth of penetration D is calculated to be greater than the distance between the ground surface and the water table, and if no impermeable stratum stops the progression of the oil, it will reach the water table.

2.2.2 Migration on Top of the Water Table

When free oil reaches the capillary fringe and if the volume is large enough, it first forms a layer of increasing thickness under the influence of further descending oil. This exerts a hydrostatic pressure depressing the groundwater surface. Gravitational forces act to restore the initial water level and cause the oil pancake to move out laterally in the same direction as the groundwater (Figure 11).

The heterogeneties of the subsoil, however, influence the direction of the paths of migration. This is particularly true in fissured terrain, or when migrating oil meets a less permeable stratum (Figure 12).

During the migration, some of the oil clings to the grains of the rock due to adsorption and capillary forces. The migration ceases when the free oil has been exhausted.

The speed at which the oil spreads out over the water table varies considerably with time. Physical and mathematical models make it possible to evaluate the full extent of the migration. The results remain, however, only as accurate as the data furnished to the model (see Appendix I). It is possible, using the following formula (Reference 9), to derive approximately the maximum spread of oil on the water table (oil pancake).

87-6

Western Oil and Gas Association
727 West Seventh Street, Los Angeles, California 90017
(213) 627-4866

November 21, 1984

Received DTS
NOV 22 1984

Harold Singer
Division Technical Services
State Water Resources
Control Board
Post Office Box 100
Sacramento, California 94801

Re: Proposed Regulations Regarding Underground Tank Storage of Hazardous Substances

Dear Mr. Singer:

Enclosed are the comments of the Western Oil and Gas Association ("WOGA") on the draft of the above-referenced proposed regulations dated November 9, 1984. While WOGA appreciates the staff's efforts to respond to our comments on the prior draft of the proposed regulations, we still have a number of concerns with respect to this draft. Those concerns are put forth in the comments that follow, however we have two major points to direct your attention to:

First, additional time for review of these regulations would benefit all those involved with and impacted by the regulations. These regulations will affect numerous facilities including thousands of retail gasoline service stations in the state. Since the last revision became available on November 9, there have been just nine working days to prepare these comments. We believe it is in the interest of the Board, the public and regulated industry to have a coherent, workable set of regulations. However, in order to achieve this, at least one more workshop between the Board's staff and industry is needed. We urge the Board to consider this before it adopts the proposed regulations.

Second, with regard to ground water monitoring wells, the statute specifically allows the local agency implementing the regulations to specify "the location, and number of wells, the depth of wells and the sampling frequency." See Cal. Health & Safety Code § 25284.1(b)(2). In many instances, however, the regulations improperly specify these parameters either as minimums or as requirements. The Board should adopt regulations that are consistent with the statute and that allow the local agency to specify these monitoring parameters.

Thank you for the opportunity to comment on the proposed regulations. If you have any questions, please call Ralph Edwards at (213) 683-6335.

Very truly yours,

Robert N. Harrison By P.D.

Robert N. Harrison
Assistant General Manager

RNH:cj

Enclosure

COMMENTS

On Behalf Of

THE WESTERN OIL AND GAS ASSOCIATION

Before the

STATE WATER RESOURCES CONTROL BOARD

November 27, 1984

Sacramento, California

Re: Proposed Subchapter 16 Regulations for Underground Tank Storage of Hazardous Substances

The Western Oil and Gas Association ("WOGA") is a trade association whose members conduct the majority of the producing, refining, transporting and marketing of petroleum products in the western United States. WOGA wishes to thank the Board for the opportunity to submit comments on the proposed regulations for the underground tank storage of hazardous substances (the "Subchapter 16 regulations") dated November 9, 1984. We appreciate the Board's efforts to address our prior comments in the current draft of the proposed regulations. Nevertheless we still have significant concerns with this draft. As in our analysis of the prior draft of the Subchapter 16 regulations, most of our comments are found in a section-by-section discussion. However, there are several general matters of concern that we will address before the section-by-section discussion.

First, the time allowed for consideration of this second draft of the Subchapter 16 regulations is simply too short for careful and considered analysis. The revisions introduced in this proposed draft have largely altered the original scope and shape of the proposed regulations and therefore require more than cursory review. We note that although the proposed regulations were available on Friday, November 9, most of our members did not receive a copy until the following week. In addition, one of the weeks included in the review period was limited due to the Thanksgiving holiday. The result is that most individuals reviewing the proposed regulations had a total of just 9 working days to prepare comments. WOGA noted in its prior comments that even the 45 days allowed for consideration of the original proposed regulations was insufficient.

WOGA is aware that the Board is required to promulgate regulations by January 1, 1985. However, additional time for review and dialogue with Board's staff would ultimately result in better regulations, both technically and legally.

WOGA's second general comment goes to those proposed regulations that mandate various monitoring well and sampling requirements for existing underground storage tanks. California Health & Safety Code § 25284.1(b)(2) provides that while the Board may promulgate regulations specifying monitoring alternatives, the local agency shall determine "the location and number of wells, the depth of wells, and the sampling frequency, pursuant to these regulations." This statutory requirement has been disregarded in a number of sections in the proposed regulations.

In the interest of brevity, WOGA will not comment in the section-by-section analysis on each of the regulations where the statutory language was disregarded. However, we have compiled a partial list below, with a brief description of the impermissible regulatory requirements:

Subsection	Requirement
2640(e)	Section 2641 monitoring alternatives are "minimums."
2641(c)(2)(B)	Continuous or daily vadose zone monitoring.
2641(c)(2)(C) and Table 4.1	Semi-annual ground water well monitoring; Table 4.1 requirement for 100-foot well depth and minimum number of wells.
2541(c)(3)(C)	Continuous or daily vadose zone monitoring.
2641(c)(4)(B)	Monthly ground water well monitoring.
2641(c)(6)(E)	Minimum semi-annual vadose zone monitoring.
2641(c)(6)(F) and Table 4.1	Minimum number of ground water monitoring wells; semi-annual ground water sampling.
2641(d)(1) and (2)	Minimum monthly monitoring for methods other than ground water monitoring.
2647(b)	Ground water monitoring wells must be located as close as possible to UST or tank cluster perimeter.
2647(c)	Minimum ground water well depth.
2648(p)(3)	Depth of exploratory boring.

WOGA believes that each of the above-referenced sections is without statutory authority in that each removes from the discretion of the local agency a decision specifically left to the local agency by the enabling statute.

In addition, the following subsections establishing requirements for new underground storage tanks (as opposed to existing underground storage tanks), although not expressly governed by or subject to Health and Safety Code § 25284.1, also remove discretion from the local agency to specify monitoring parameters:

Subsection	Requirement
2632(c)(1)(B)	Frequency of visual inspections for new tanks.
2632(c)(2)(B)	Frequency of manual monitoring for new tanks.
2634(d)(1)	Frequency of monitoring using a leak detection system for new tanks.

WOGA believes that in order for the regulations to be consistent with the spirit of the statute these subsections should also be amended to give the local agency the discretion to choose the above-referenced frequencies.

WOGA's final general comment is that to the extent any of our prior comments remain unaddressed by the Board in the current draft of the proposed regulations, WOGA hereby incorporates such prior written and oral comments. Throughout the following analysis, we will occasionally refer to prior comments. Such express referral is not meant to preclude the incorporation by reference of all other prior written and oral comments which have not been addressed.

We turn now to our comments on specific sections of the proposed regulations.

Section-by-Section Analysis

Article 2

2621. Additional Definitions

"Daily"

WOGA repeats its prior comment that a definition of "daily" should be included as follows:

"'Daily' means normal operating day."

This term is used throughout the proposed regulations and is still defined too broadly. For example, in subsection 2644(c) "daily" inventory reconciliation would be required even on days when the facility is closed. A typical example of such closings are those service stations with car wash facilities. These stations are usually closed during bad weather yet would be required to continue inventory reconciliation under the regulations.

"Double-walled tank"

For clarity,[1] the second sentence in the definition of "Double-walled tank" should be as follows:

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[1] Throughout these comments, where applicable, we will use the criteria set forth in Cal. Gov't Code § 11349.1 for review of state regulations. These include: Necessity, authority, clarity, consistency, reference, and nonduplication.

> "The outer shell must provide structural support and must be constructed primarily of non-earthen materials including, but not limited to, concrete, steel, <u>or</u> plastic."

<u>Article 3</u>

<u>2630. Applicability</u>

WOGA urges the Board to adopt a new subsection (d) to this section which would exempt piping which does not normally contain liquid substances from the secondary containment requirements of Article 3. It is simply unnecessary to subject such piping to these requirements if they do not normally contain liquids. The exemption could be worded as follows:

> "(d) <u>Vent and vapor piping connected to an underground storage tank normally not containing or storing liquid are exempt from the secondary containment requirements of this article.</u>"

<u>2633. Construction Standards for New Motor Vehicle Fuel Tanks</u>

This section should contain a subsection which recognizes that double-walled tanks meet the requirements of a primary container and a leak interception and detection system. This would simplify the permitting of such tanks and would avoid the task of requiring that every double-walled tank be shown to meet all of the primary container and leak interception and detection system requirements. Therefore, WOGA proposes that a subsection (h) be added to section 2633 as follows:

> "(h) <u>A double-walled tank shall be considered to meet all of the requirements of a primary container and a leak inter-</u>

ception and detection system as specified in this section."

2634. Monitoring Standards for New Motor Vehicle Fuel Tanks

(1) 2634(a)(3)

This subsection requires hydrostatic tank testing every two years. However, double-walled tanks should be exempt from this requirement since the annular space between the walls can be adequately checked without undertaking a hydrostatic test. For example, the use of a dip stick is a reliable and inexpensive method to test double-walled tanks. This exemption could be accomplished by changing subsection (a)(3) as follows:

> "Hydrostatic testing of the tank, excluding double-walled tanks, every two years according to the criteria specified in Section 2643 of Article 4, and. . . ."

(2) 2634(d)(1)

This subsection sets forth the frequency requirements of leak interception and detection system monitoring. We believe such frequency is best left up to the local agency which will be most familiar with the facility as a whole, the substance contained in the underground storage tanks or tanks, and the groundwater to be protected. Therefore, WOGA suggests deleting the first sentence of subsection (1) and beginning as follows:

> "(1) Monitoring as required by the local agency based on an assessment of the available volume of the leak interception and detection system, . . ."

(3) <u>2634(e)(3)</u>

WOGA notes that in subsection 2634(e)(3) a closing parenthesis symbol should be added after the word "days" for clarity.

(4) <u>2634(f)</u>

This subsection sets forth the steps to be taken if a gain or loss of hazardous substances is observed in excess of specified limits. WOGA believes that gains should not be treated the same as losses since most gains can be readily explained by a check: (1) of delivery records, (2) of the dispensing meters, or (3) for water in the tank. We note that the proposed regulations follow closely the methods for investigating losses (not gains) in American Petroleum Institute, <u>Recommended Practice for Bulk Liquid Stock Control at Retail Outlets</u> (3d ed. 1977).

(5) <u>2634(f)(3)</u>

This subsection requires the operator to have performed a complete review of all inventory records from the last time a "zero gain or loss condition existed." WOGA suggests that this is impractical since minute gains and losses will almost always be recorded. WOGA suggests that the review should only go back to the prior recorded gain or loss in excess of the amounts specified in subsection (e).

(6) 2634(f)(7)

In subsection 2634(f)(7) WOGA again asks that the Board expressly recognize that double-walled tanks need not be tested in the same manner as other tanks. Monitoring of the annular space alone should be sufficient.

2635. General Construction Standards

(1) 2635(b)(7)

This subsection would require that the annular space in double-walled tanks be monitored using either pressure or vacuum testing. WOGA disagrees and believes that, consistent with its prior comments, the annular space can be adequately monitored using a stick or other methods. In order to recognize this, the final sentence in this subsection should be as follows:

> "Double-walled tanks are exempt from the requirements of this section provided that the annular space is monitored."

(2) 2635(b)(8)

This subsection sets forth the requirements for an overflow protection system "when required by the local agency." WOGA believes that the Board is not allowing enough flexibility to the local agency when it establishes an overflow protection system with the detail it has done here. WOGA suggests that the local agency should be given the discretion to tailor the system on a case-by-case basis. This would also recognize that technological changes could occur resulting in an improved system that would not necessarily meet the rigid design defined by the current regulations.

By adopting a performance standard in lieu of the design standard in the current draft, the Board would be addressing the concerns of the legislature when it adopted Cal. Gov't Code § 11340.1. That section encourages state agencies to adopt performance standards whenever they can be "as effective and less burdensome" than design standards. Therefore, WOGA believes that this subsection should be amended to allow the local agency to specify the elements of the overflow protection system.

(3) 2635(b)(8)(A)

The references in this subsection to "(2) or (3)" should probably be to "(B) or (C)."

(4) 2635(b)(9)(A)

WOGA repeats its prior comment on this subsection which requires visual monitoring and control of filling operations by the operator. We believe that these functions can be performed equally as well by the delivery vehicle operator. Therefore, WOGA recommends the following change:

> "Both the fluid level is visually monitored and the filling operation is controlled by the facility or delivery vehicle operator during filling of the underground storage tank."

(5) 2635(b)(9)(B)

WOGA appreciates the Board's effort to incorporate its earlier comment into this regulation. However, the present language is illogical. As worded, the subsection would require the underground storage tank's capacity to be "at least 103 percent of the entire tank compartment to be delivered or 200 gallons, whichever is less." Obviously, the Board does not mean to require an underground storage tank to have a 200-gallon capacity if the delivery vehicle had a capacity of, say, 2,000 gallons. However, that could be the result under the present language. Therefore, WOGA proposes language similar to that it proposed in its earlier comment:

> "The minimum available capacity of the tank to be filled either (1) is determined immediately prior to the filling to be 103 percent of the volume of the product to be delivered as determined by tank gauging, or (2) is 200 gallons plus the volume of product to be delivered, whichever is less."

Article 4

2640. Applicability

(1) 2640(b)

Subsection 2640(b) indicates that the objectives of an existing UST monitoring program are to determine if unauthorized releases are occurring and "to detect unauthorized releases that occur in the future before ground water is affected." Nevertheless, the Board has proposed the alternative of ground water monitoring where ground water levels are relatively shallow. *See* subsection 2641(c)(4)(1).

The objective in subsection 2640(b) might preclude ground water monitoring if monitoring must detect releases before ground water is "affected." Even a minute incursion of a leaked hazardous substance might "affect" ground water, yet we believe ground water monitoring, where required, is a viable means of monitoring. Therefore, WOGA suggests that the objective in subsection 2640(b) close with the following language:

> "to detect unauthorized releases in the future."

(2) Proposed § 2640(g)

Subsection 2640(f) of the prior draft of the proposed regulations has been deleted from this draft. That subsection would have allowed local agencies to approve additional monitoring methods which are "equivalent to or better than the methods specified in the regulations." WOGA believes that the Board should still allow local agencies the flexibility of approving such additional methods. This would provide an incentive for development of such alternatives and would give the local agencies the flexibility to approve monitoring methods on a case-by-case basis. WOGA suggests adding new subsection (g) as follows:

> "Additional monitoring methods that are equivalent to or better than the methods specified in this article may be approved by a local ageancy pursuant to the intent of subsections (b) and (e) of this section"

2641. Monitoring Alternatives

(1) 2641(c)(3)(A)

This subsection prohibits vadose zone monitoring where the first perennial ground water, including perched ground water, is "less than 100 feet deep . . . ." WOGA, in its original technical comments, suggested depths where vadose zone monitoring wells would apply and we refer the Board to those comments again.

(2) 2641(c)(4)(i)

This subsection prohibits ground water monitoring where the perennial ground water "is normally greater than 30 feet deep. . . ." While WOGA understands that ground water monitoring should not be required where the ground water is at great depths, it suggests that a more realistic water depth prohibition would be 30 feet below the tank invert, as noted in WOGA's earlier comments.

(3) 2641(c)(4)(A)(iii)

This subsection, which requires that ground water monitoring wells should be prohibited if they "cannot be screened within the interval 10 feet above the highest perennial ground water to 20 feet below the lowest ground water level," should be deleted. Where the ground water is at a depth of less than 10 feet, this subsection would prohibit ground water monitoring wells. However, it is precisely when ground water is at such shallow depths that this is the most effective and rapid method of leak detection. Such monitoring should not be prohibited where the ground water depths are shallow.

(4) <u>2641(c)(5)(B)(ii)-(iii)</u>

These two subsections describe how daily variations in inventory reconciliation should be calculated. WOGA believes that these directions are too confusing and instead should simply be the performance standard set out in subsection 2641(c)(5)(B)(i) (which states that the daily variation in inventory reconciliation shall be the difference between the calculated volume in storage and the actual volume in storage). WOGA believes that the Board should either clarify the language in subsections (ii) and (iii) or delete it.

(5) <u>2641(c)(5)(V), Table 4.2</u>

In Table 4.2 under this subparagraph, the allowable measurement error for tanks between 4,000 and 8,000 gallons is written as "20 gallons." WOGA believes that this is a typographical error and that the correct figure should be "50 gallons," as reflected in Table 4.1.

(6) <u>2641(c)(6)</u>

This subsection proposes a monitoring alternative that includes inventory reconciliation, annual underground storage tank testing, pipeline leak detectors, vadose zone or ground water monitoring, and soil testing. WOGA believes that annual tank testing is unnecessary in light of the additional monitoring required under this subsection and would suggest its deletion.

In addition, alternative 6 refers to alternative 2 for ground water monitoring, which may require monitoring wells for pipelines. Since alternative 6 requires line leak detectors, we do not feel that additional ground water monitoring wells for pipelines are necessary.

(7) <u>2641(c)(8)(A)</u>

This subsection establishes alternative monitoring methods for: (1) small businesses; owners who are planning to close their underground storage tank facility within three years; and governmental agencies with budget constraints. The alternative monitoring method allows such owners to utilize tank testing and either (1) inventory reconciliation or (2) tank gauging for up to three years before installing other monitoring methods. This subsection is clearly an implicit recognition of the difficulty, if not impossibility, for most owners of underground storage tanks of complying with the July 1, 1985 deadline specified in the statute, Health & Safety Code § 25284.1(a), for implementation of a monitoring system.

WOGA strongly urges the Board to include a fourth category of alternative monitoring methods for all other owners or operators of underground storage tanks. In concept this fourth category will provide a mechanism for the local agency to approve a delayed compliance schedule for installation of the complete set of monitoring requirements for a permit applicant when it is impossible to meet the July 1, 1985 deadline. Such an alternative could include those monitoring techniques, such as tank testing or inventory reconciliation, which can be implemented relatively quickly and still provide protection until other alternatives become available. Such a mechanism would go a long way toward solving the problem of compliance by July 1, 1985. Testimony before the Board at the October 23, 1984 public hearing indicated that because of the limited number of contractors, consultants, geologists and hydrogeologists, in addition to the limited quantities of gauges and other mechanical devices necessary to comply with the monitoring alternatives, it is impossible for many to meet the July 1, 1985 deadline. In addition, local agencies will simply not have the resources to process all of the permit applications before July 1, 1985. We believe the Board could alleviate this problem by adding the fourth category just suggested to subsection 2641(c)(8)(A). Further support for this delayed compliance schedule is found in subsection 2712(e) which allows local agencies 18 months to issue permits.

(8) 2641(d)

WOGA believes that this entire subsection should be dropped. It sets forth two criteria which the local agencies are to use to evaluate the proposed monitoring alternatives. Both criteria remove discretion from the local agency that was clearly given to the local agency by the statute.

Subsection 2641(d)(1) requires monthly, other than ground water, monitoring "[w]henever possible." However, Health & Safety Code § 25284.1(b) states that:

> "Alternative methods of monitoring the tank on a monthly, or more frequent basis <u>may</u> be required by the local agency, consistent with the regulations of the Board." (Emphasis added.)

Thus, the regulations remove some of the discretion of the local agency in choosing the frequency of monitoring by requiring it to be monthly whenever possible. The regulations should leave the frequency of monitoring up to the local agency, as directed by the statute.

Subsection 2641(d)(2) also removes discretion given to the local agency by the statute. It requires ground water monitoring in certain situations and is, therefore, contrary to the regulatory scheme authorized by the statute in Health & Safety Code § 25284.1(b) which gives the local agency the discretion to choose the alternative, including ground water monitoring. This subsection would also preclude use of monitoring alternatives 1, 3, 5, 7 and 8 in some cases.

Therefore, subsection 2641(b) should be amended as follows to delete the reference to subsection (d):

> "The local agency shall review the monitoring alternative . . . and shall approve the monitoring alternative if they [sic] find. . ."

<u>2642. Visual Monitoring</u>

In our prior comments, WOGA asked that the requirement for the reporting of visual observations of the storage tank in subsection 2642(c)(4) be deleted. We repeat that comment here because it is unrealistic to believe that the local agency will be able to review or process such data. We agree with the Board that visual observations should be recorded, but they should only be reported if requested. We suggest the following language:

> "(4) <u>Recordation of the observations made and the liquid level in the tank at the time of the inspection.</u>"

<u>2643. Underground Storage Tank Testing</u>

(1) <u>2643(a)</u>

The word "shall" ought to be included prior to the word "implement" for clarity.

(2) <u>2643(c)</u>

This subsection sets forth requirements for hydrostatic tank testing. WOGA suggests that the Board require the same kind of hydrostatic testing in this subsection as is required by subsection 2634(f)(6). Those testing methods are in Sections 4.-3.6 and 4.-3.7 of the National Fire Protection Association ("NFPA") publication entitled "Underground Leakage of Flammable and Combustible Liquids," (1983) (NFPA Publication No. 329). In addition, this publication will be cited in the statute (Health and Safety Code § 25284.1(b)(1) and (4)(B) as amended by AB 3781 which will be in effect on January 1, 1985) as the authority for tank testing.

(3) <u>2643(d)</u>

This subsection governs frequency of tank testing. The prior draft regulations set forth a schedule for tank testing frequency which depended upon the material used to construct the tank. WOGA believes that the schedule set forth in the prior draft, as modified according to WOGA's prior comments, is far more practical than the one-year frequency set forth in alternatives 5, 6 and 7 of subsection 2641(c). The schedule originally proposed required an initial test within one year of permit issuance and then annual retesting after 10 years for unprotected steel tanks or after 15 years for FRP or protected tanks. It simply makes no sense, and the Board has not demonstrated the need, to require all tanks to be tested annually. Therefore, WOGA asks that the prior proposed schedule, as modified by WOGA's comments, be adopted instead of the one-year requirement.

(4) <u>2643(h)</u>

This subsection should be changed consistent with our comment under subsection 2643(c). Thus, instead of requiring that underground storage tanks or pipelines containing flammable or combustible liquids shall not be pressure tested using air or other gases, a simple reference to NFPA Publication No. 329 will suffice:

> "<u>Underground storage tanks containing flammable or combustible liquids shall be tested according to the provisions in NFPA 329, 'Recommended Practice for Handling Underground Leakage of Flammable and Combustible Liquids,' as amended.</u>"

Once again, this change is consistent with Health & Safety Code § 25284.1(b)(1) and (4) (as amended by AB 3781).

<u>2644. Inventory Reconciliation</u>

(1) <u>2644(d)(6)</u>

The reference to "Subsection (6)" should probably be changed to "Subsection (5)" for clarity.

(2) <u>2644(f)</u>

This subsection requires the "owner or operator" to submit: (1) a statement to the local agency under penalty of perjury that it has reviewed the inventory reconciliation data; and (2) a list of any variations in excess of the allowable variations. WOGA has two concerns with this subsection:

First, since the operator will almost always be the person charged with inventory reconciliation, it makes no sense to require the owner to submit the statement. If the owner is also the operator, then simply requiring the operator to submit the statement will achieve the desired result. This change is also consistent with the statute, which only requires inventory reconciliation "by the operator," <u>not</u> the owner. <u>See</u> Health & Safety Code § 25284.1(b)(3).

Second, there is no statutory requirement that such a statement be submitted to the local agency. Instead, the statute simply requires review of the records. WOGA believes that the requirement to submit a quarterly sworn statement will only increase the amount of paper submitted to the local agency without achieving any real benefit. It appears unlikely that local agencies will have the resources to review and process such statements. Finally, requiring a statement to be filed upon penalty of perjury goes beyond the Board's authority because it essentially provides an enforcement mechanism (conviction of perjury for not reviewing records) which was not set forth in the statute. <u>See</u> Health & Safety

Code § 25287 for the statutory enforcement methods. WOGA urges the Board to delete this subsection.

2645. Soil Testing

(1) 2645(g)

This subsection requires soil samples to be "of sufficient volume" to perform specified analyses. In practice, because of soil characteristics, it may be impossible to extract samples of sufficient volume to satisfy this requirement. WOGA asks that the Board recognize this by inserting the words "if feasible" as follows:

> "Soil samples shall be of sufficient volume, if feasible, to perform the designated analyses including soil vapor and soil extract analyses and to provide replicate analyses, if specified."

(2) 2645(j)

This subsection requires that each soil sample be analyzed by field or laboratory methods "that provide quantitative results." In WOGA's prior comments, we suggested that in the case of hydrocarbons, such as those in motor vehicle fuels, a simple visual and odor test would provide an initial indication of contamination which would be reliable. The ability of the human nose to detect very small concentrations of hydrocarbons is well-documented and should be recognized in the regulations by allowing such a qualitative test prior to requiring more expensive and time-consuming laboratory analysis.

(3) 2645(h)

This subsection requires that soil samples be analyzed for constituents that have been, but no longer are, stored in the underground storage tank. Consistent with our earlier comments, WOGA does not believe that these regulations are the proper vehicle for the Board to seek evidence of historic unauthorized releases of hazardous substances. This was an objective in the prior draft of the regulations (*See* the prior version of subsection 2640(a)) which was dropped from this draft. WOGA asks that the Board make this subsection consistent with that change and only require analysis of soil samples for constituents which are in the underground storage tank.

Therefore, WOGA proposes the following:

> "Samples shall be analyzed for one or more of the most persistent constituents that *are* stored in the underground storage tank. If the hazardous substance is known to degrade or transform to other constituents in the soil environment, the analysis shall include these degradation and/or transformation constituents."

(4) 2645(m)

For clarity, WOGA believes that this subsection should be amended with the underlined language as follows:

> "If soil analysis indicates that an unauthorized release *from an underground storage tank* has occurred, the permittee shall report the release pursuant to Article 5 of this Subchapter and shall repair or abandon the underground storage tank pursuant to Article 6 or 7 of this Subchapter."

2646. Vadose Zone Monitoring

Regarding subsection 2646(f)(1), WOGA wishes to repeat its prior comment:

> "We propose that this section be rewritten to provide for a single demonstration of a vapor monitoring system for multiple tank installations where a common product is stored and a similar backfill material is used."
>
> (*See* WOGA Comments, dated October 23, 1984, at 34).

We, again, urge the Board to adopt the language suggested in our earlier comments.

2647. Ground Water Monitoring

Subsection 2647(d) requires that monitoring well casings "shall extend to the bottom of the boring and be factory perforated from a point 5 feet above the bottom cap to a point 10 feet above the highest anticipated ground water level." We believe this is impractical for two reasons: First, the requirement for factory perforations 5 feet above the bottom cap is only necessary for water-producing wells, not monitoring wells. Second, if ground water is less than 10 feet from the surface, there will be no perforated well casing extending 10 feet from the surface. (*See* our comments under subsection 2641(c)(4)(A)(iii).)

We propose that this subsection be worded as follows:

> "Ground water monitoring well casings shall extend to the bottom of the boring and be factory perforated from a point approved by the person specified in Section 2648(t) to the bottom cap."

2648. General Construction and Sampling Methods

(1) 2648(h)

The subsection requires that ground water monitoring wells be developed until the discharge water "contains less than 10 ppm solids." This requirement is cumbersome and unnecessary. Laboratory tests establishing the concentrations of solids may take up to two days and, in some cases, the water being sampled may naturally contain solids in concentrations greater than 10 ppm. WOGA suggests that the Board simply require that "wells shall be appropriately developed."

(2) 2648(p)

Subsection 2648(p) sets forth a method for determining the existing and historic high ground water levels. Both methods require a survey of existing or recorded ground water level measurements over a large area surrounding the facility. WOGA believes that the method used for determining these ground water levels should be left up to a professional geologist, civil engineer, or engineering geologist (*see*, *e.g.*, the list in subsection 2648(t)). The extensive review specified in the regulation may simply be unnecessary if ample data already exists or the specialist has first-hand experience with the surrounding area. In order to make the suggested change, the last sentence in paragraph (p) should be deleted, paragraphs (p)(1)-(3) should be deleted, and the second sentence in paragraph (p) should read as follows:

> "Historic high ground water levels and existing ground water levels shall be determined by a professional geologist, civil engineer, or engineering geologist

> <u>who is registered or certified by the State of California</u>."

Alternatively, if the Board chooses to leave paragraphs (p)(1)-(4) in the regulations, which we would oppose, it should, at the least, amend (p)(1) as follows:

> "The exploratory boring shall be directed downgradient if possible and as near as possible to the tank <u>within the boundaries of the property encompassing the facility</u>, but no further than 500 feet from the tank."

<u>Article 5</u>

<u>2651. Unauthorized Release Requiring Recording</u>

Subsection (a)(3) requires that a copy of any hazardous waste manifest used be submitted with an operator's report of an unauthorized release. WOGA objects to this requirement on the grounds of necessity. Since such a manifest must be sent to the Department of Health Services anyway, this requirement is simply a duplication of effort. WOGA asks that this requirement be dropped.

<u>2652. Unauthorized Releases Requiring Reporting</u>

(1) <u>2652(c)(4)</u>

For the same reasons stated in the comments under the prior section, WOGA objects to the hazardous waste manifest information required in this subsection.

(2) <u>2652(c)(3)</u>

WOGA believes that the requirement in this subsection that the "approximate cost" of any clean-up be reported should be deleted. Such costs can rarely be approximated in advance and WOGA sees no need for the Board or local agency to have such approximate costs.

Article 6

2661. Repair Evaluation

Subsection (c) sets forth criteria which must be satisfied before a tank may be repaired. These criteria are used to determine if the tank repair can be effectively accomplished. In other words, if one of the listed conditions exists, then repair to the tank will not be considered sufficient. WOGA believes that these criteria are simply unworkable. For example, one criterion which would prohibit tank repair is "more than ten (10) small perforations." However, there is no definition of "small perforation." Another criterion is "any failure or opening within six inches of any seam or wall." It is unclear whether the cylindrical sides of a tank are "walls" or not.

In order to alleviate the uncertainty in such criteria, WOGA suggests that the Board adopt the same criteria set forth in American Petroleum Institute, Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks, Publication 1631 § 7.2 (1st ed. 1983). Those criteria are:

> "1. A tank having an open seam or split no longer than three (3) inches; or
>
> 2. A tank having a perforation no larger than one and one-half (1-1/2) inches in diameter except under the gauging opening where the perforation may

be no larger than two and one-half (2-1/2) inches in diameter; or

3. A tank with less than five (5) perforations (none larger than one-half inch in diameter) in any one square foot area.

4. A tank with less than twenty (20) perforations (none larger than one-half inch in diameter) in a five hundred (500) square foot area.

Tanks that exceed any of the above should not be interior lined unless approved by the [local agency]."

2662. <u>Repair Methodology</u>

Subsection (d) requires use of repair materials and lining process which are listed or certified by a "nationally recognized independent testing organization." The draft regulation goes on to state that: "The requirement shall become effective one year after the effective date of these regulations or one year after a listing or certification procedure is available." WOGA suggests that the language "whichever is later" be added to this last sentence since it makes no sense to require listed or certified repair materials and lining process if such listing and certification is not available.

2663. <u>Primary Container Monitoring</u>

(1) <u>2663(a)</u>

This subsection requires vacuum testing of tanks which have undergone repair. WOGA believes that vacuum testing to 5.3 inches of Hg for one minute will not effectively test the bond of an interior liner and could collapse the tank. WOGA therefore suggests that this requirement be dropped from subsection (a).

(2) <u>2663(b)</u>

WOGA notes that the reference to Appendix I for acceptable procedures *for pressure testing is incorrect since* Appendix I contains no pressure testing procedures.

<u>Article 7</u>

<u>2671-2672. Temporary and Permanent Closure</u>

WOGA suggests that both of these sections should reference NFPA, [title and edition to be supplied], instead of setting forth separate temporary and permanent closure requirements. The NFPA closure requirements have been accepted by most local jurisdictions and are standard procedures for many. They are proven, safe and effective means of closure.

(1) <u>2672(d)</u>

This subsection requires that a number of soil samples be taken, in certain circumstances, when an underground storage tank is closed. WOGA notes that requirement (1) of this subsection could result in an excessive number of soil samples being taken when a typical motor vehicle fuel storage tank is closed. WOGA suggests that this is an area best left to the discretion of the local agency. This could be accomplished by changing subsection (d) to:

> "<u>The owner of an underground storage tank being closed pursuant to this Section shall demonstrate to the satisfaction of</u>

the local agency that no unauthorized release has occurred."

and deleting the rest of the language in the subsection.

Conclusion

WOGA appreciates this opportunity to comment on the Board's proposed regulations governing underground storage tanks.

87-H

Western Oil and Gas Association
727 West Seventh Street, Los Angeles, California 90017
(213) 627-4866

January 17, 1985

Mr. Harold Singer
Division Technical Services
State Water Resources Control Board
Post Office Box 100
Sacramento, California 94801

Re: WOGA's Comments on Proposed Regulations Regarding Underground Tank Storage of Hazardous Substances

Dear Mr. Singer:

Enclosed are the comments of the Western Oil and Gas Association ("WOGA") on the draft of the above-referenced proposed regulations dated January 3, 1985. Once again, while WOGA appreciates the staff's efforts to respond to its comments on the prior draft of the proposed regulations, WOGA still has a number of concerns with respect to this draft. The comments that follow address those concerns, however, we would like to bring to your attention three major concerns:

First, it is clear that the statute authorizing these regulations leaves the "location and number of [ground water] wells, the depth of wells and the sampling frequency" up to the local agency. See Cal. Health & Safety Code § 25284.1(b)(2). In spite of this language, the proposed regulations continue to specify these parameters. For example, Table 4.1, which summarizes the monitoring alternatives in Article 4, expressly sets forth the minimum number of ground water monitoring wells. It makes no sense, and is not authorized by the statute, for the Board to establish the minimum number of ground water monitoring wells for all facilities. That kind of determination should be made on a case-by-case basis. WOGA strongly urges the Board to leave the discretion to the local agency regarding the location and number of ground water wells and the depth and sampling frequency of such wells.

Second, WOGA believes that the proposed regulations unnecessarily restrict the use of ground water monitoring as a primary means of monitoring. For example, in the Applicability Section of Article 4, it is expressly stated that ground water monitoring cannot be utilized as a primary means of monitoring when the ground water has actual or potential beneficial uses. In addition, proposed Section 2641(d) directs the local agency to seek a primary method of monitoring other than ground water monitoring "[w]henever possible." The problem is that in cases where the ground water is very shallow ground water monitoring may be the most practical means of monitoring the tank. It does not make sense to require expensive and redundant monitoring systems that will be no more effective than ground water monitoring in detecting a leak from the underground storage tank. WOGA urges the Board to recognize that in many cases ground water monitoring may be the most practical means of monitoring.

Third, WOGA believes that the Board should allow the local agency to approve monitoring alternatives that are different from those put forth in the proposed regulations if the local agency determines that such different alternatives will afford equivalent protection to the ground water. A subsection which would have given the local agency this authority was initially included in the proposed regulations. WOGA believes that if the local agency cannot approve any other monitoring alternatives other than those in the regulations there will be no incentive to develop other monitoring alternatives. Allowing the local agency to approve monitoring alternatives if they afford equivalent protection would be consistent with Cal. Gov't Code § 11340.1 which mandates that, whenever possible, state agencies adopt performance standards in lieu of design standards.

Once again, WOGA appreciates this opportunity to comment on the Board's regulations.

Very truly yours,

Robert N. Harrison by R.D.

Robert N. Harrison,
Assistant General Manager

RNH:cj

Enclosure

87H

COMMENTS

On Behalf Of

THE WESTERN OIL AND GAS ASSOCIATION

Before The

STATE WATER RESOURCES CONTROL BOARD

January 18, 1985

Sacramento, California

Re: Proposed Subchapter 16 Regulations for Undergound Storage of Hazardous Substances

Members of the Western Oil and Gas Association ("WOGA") conduct the majority of the producing, refining, transporting and marketing of petroleum and petroleum products in the western United States. WOGA wishes to thank the Board for the opportunity to submit comments on the proposed regulations for the underground storage of hazardous substances (the "Subchapter 16 regulations") dated January 3, 1985. We appreciate the Board's efforts and its staff's efforts to address our prior comments in the current draft of the proposed regulations. Nevertheless, we continue to have a number of concerns regarding the proposed regulations. In the comments that follow, we first address two general matters of concern and then follow with a section-by-section analysis.

First, while we appreciate the Board's efforts to undertake another round of public review, it appears there will be little or no time for consideration of comments submitted prior to or on January 18. Thus, although comments submitted by January 18 will be considered part of the public record for this rulemaking, neither the Board or its staff will likely have sufficient time to review those comments and make any relevant changes. We urge the Board to remain open to the possibility of scheduling a hearing after January 18 for the adoption of the proposed regulations after it has reviewed the public comments.

Second, WOGA wishes to repeat its prior comment that many of the regulations still do not conform with Health & Safety Code § 25284.1(b)(2) which provides that it is to be left up to the local agency to determine the location, number, depth, and sampling frequency of wells required to be installed pursuant to the regulations. In WOGA's comments dated November 27, 1984, we supplied the Board with a partial list of the regulations that were in conflict with the authorizing statute (see pages 3-4). Although we will not repeat that list here, we will give one example:

Subsection 2641(c)(2)(C) of the proposed regulations expressly sets forth sampling frequencies, and the number and location of ground water monitoring wells (see also Table 4.1 referenced in subsection 2641(c)(2)(C)) with a significant amount of detail. That kind of detail, specifying the minimum number of ground water monitoring wells, their location and frequency of sampling seems to be exactly what was to be avoided by the statutory provision leaving such determinations up to the local agency. It is precisely because the various factors that go into the determination of the number of wells, the frequency of monitoring, etc., will be different for different facilities that these parameters were not meant to be determined by the Board's regulations. Instead, it makes better sense, as required by the statute, to allow the local agency to determine these parameters on a case-by-case basis.

Proposed section 2646(d) is a good example of regulatory language which would leave these parameters up to the discretion of the local agency. That subsection states that:

> "The number, location and depth of vadose zone monitoring points shall be selected so as to give the earliest possible warning of any unauthorized release from the underground storage tank."

WOGA therefore strongly urges the Board to follow the authorizing statute and, in all cases, to allow the local agency to select the number, depth, location, and frequency of sampling for all wells.

Finally, to the extent that any of WOGA's prior comments have not been addressed by the current draft of the proposed regulations, WOGA hereby incorporates by reference those comments.

We now turn to our comments on specific sections of the proposed regulations.

Section-by-Section Analysis

Article 2

2621. Additional Definitions

In prior comments WOGA noted the need for a clarification in the regulations regarding the scope of the definition of "underground storage tank." The present draft of the proposed regulations still does not address this comment. Specifically, WOGA seeks a clarification that "vent and vapor recovery piping" is not included within the definition of "underground storage tank" and, therefore, is not meant to be covered by these regulations. At a meeting with members of the Board's staff on November 26, 1984, the staff responded to this concern by noting that the statutory definition of "underground storage tank" made it clear that vent and vapor recovery piping was not to be included in the regulations. That definition states that:

> "'Underground storage tank' means any one or a combination of tanks, including pipes connected thereto, which is used for the storage of hazardous substances and which is substantially or totally beneath the surface of the ground."
>
> Health & Safety Code § 25280(m) (emphasis supplied).

The Board's staff argued that since vent and vapor recovery piping is not "used for the storage of hazardous substances," it is not part of an underground storage tank. WOGA agrees with the Board's staff, but believes that such an understanding should be expressly stated in the regulations.

Article 3

2635. General Construction Standards

Subsection 2635(b)(4) specifies design and construction standards for primary containers and double-walled storage tanks made of steel. The prior draft of the proposed regulations allowed these kinds of tanks to be protected by either (1) a cathodic protection system, or (2) a corrosion-resistant coating. The current draft of the proposed regulations requires cathodic protection regardless of the use of corrosion-resistant coatings. WOGA can find no justification (and the staff has not given one) for the removal of the corrosion-resistant coating option in this subsection. In fact, language in the subsection after the cathodic protection requirement states that "[s]election of the type of protection" is to be based upon: "a certification listing by a nationally recognized independent testing organization or the judgment of a registered corrosion engineer or a National Association of Corrosion Engineers (NACE) accredited corrosion specialist taking into account the corrosion history of the area." This existing language would seem sufficient to ensure that proper corrosion-resistant techniques will be employed. WOGA asks that the Board leave the alternative for corrosion-resistant coatings in the regulations subject to approval by the specialists or organizations already set forth in the regulation.

Article 4

2640. Applicability

Subsection 2640(b) states that "[g]round water monitoring may be utilized as a primary means of monitoring when the ground water does not have actual or potential beneficial uses." WOGA is concerned that in some cases for practical reasons ground water monitoring may be the only effective means of monitoring even if the ground water has actual or potential beneficial uses. For example, ground water may be higher than the bottom of the underground storage tank. In that case ground water monitoring should be allowed as the primary method of monitoring, since it will be the most practical. WOGA believes that this concern could be addressed by simply adding language at the end of the above-quoted text as follows:

> "Ground water monitoring may be utilized as a primary means of monitoring when the ground water does not have actual potential or beneficial uses, <u>or if it is the only practical means of monitoring</u>."

In prior comments submitted by WOGA, we proposed that a new subsection (g) be added to proposed section 2640 which would allow local agencies to approve alternative monitoring methods, different from those in the proposed regulations, which would be "equivalent to or better than the methods specified in the regulation." <u>See</u> pages 9-10 of the November 27, 1984 WOGA comments. At that time, we noted that such a provision had been included in the original draft of the regulations and we stated our belief that such a provision would provide an incentive for the development of alternative monitoring methods. WOGA repeats that comment here and urges the Board to provide a mechanism whereby a local agency may approve a monitoring alternative that is not listed in the proposed regulations. We repeat that such a subsection would comply with Gov't Code § 11340.1 which encourages the adoption of performance standards in lieu of design standards. In addition, such a subsection would comply with the statute which clearly states that the alternative methods of monitoring include, "but are not limited to" the list set forth in Health & Safety Code § 25284.1(b).

2641. Monitoring Alternatives

(1) 2641(c)(2)(C)

This subsection provides for the analysis of samples from ground water monitoring wells. It allows for either visual observation or field or laboratory analysis as determined by the local agency. It then goes on to state that "The local agency shall require laboratory verification at periodic intervals if visual or field anlysis cannot achieve levels of detection equivalent to laboratory analysis." (Emphasis supplied.) The prior sentence in the regulation already gives local agencies the discretion to decide whether visual observation or field or laboratory analysis will be required and WOGA believes that the local agency should have discretion to require laboratory verification of field or visual analysis if such analysis cannot achieve the levels of detection equivalent to laboratory analysis. This could be accomplished by simply changing the word "shall" in the final sentence of that subsection to "may."

(2) <u>2641(c)(3)(A)</u>

This subsection, describing monitoring alternative No. 3, states that: "This alternative shall not be approved if first ground water, including intermittent, perched ground water, is less than 100 feet deep and this ground water has actual or potential beneficial uses." WOGA believes that this alternative, which includes vadose zone monitoring, soil sampling and tank testing, should not be restricted to cases where ground water is 100 feet deep or more. The monitoring methods described in this alternative would clearly be effective to detect an unauthorized release with sufficient time to prevent ground water contamination if the ground water were only 50 feet below the surface. Thus, WOGA seeks a change in the restriction of the use of this alternative to those situations where the ground water is less than 50 feet deep instead of less than 100 feet deep.

(3) <u>2641(c)(4)(B)</u>

WOGA's comment regarding this subsection is similar to its comment regarding subsecton 2641(c)(2)(C). Again, we ask that the local agency be given the discretion to require periodic laboratory analysis of ground water samples if visual observation or field analysis does not provide the same degree of detection as that of laboratory analysis. The requested change could be accomplished by changing the word "shall" in the final sentence of that subsection to the word "may."

(4) 2641(c)(5)

WOGA is concerned that this subsection requires annual tank testing. See (C). We refer the Board to our comments under section 2643 where we suggest a different schedule for tank testing.

(5) 2641(c)(6)

Alternative No. 6 requires inventory reconciliation, tank testing, pipeline leak detectors, soil samples, and either vadose zone monitoring or ground water monitoring. WOGA believes that tank testing on an annual basis as required in this subsection is simply unnecessary. Inventory reconciliation, leak detectors and either vadose monitoring or ground water monitoring will provide sufficient redundancy for this monitoring alternative without the need for annual tank testing. Such testing is expensive (estimated to be approximately $1,500 to $2,000 per year for a typical retail gasoline service station) and will not add to the protection already afforded by the other requirements of this monitoring alternative. WOGA therefore asks that the Board drop the requirement for tank testing from alternative No. 6.

Finally, subsection (F), which covers the analysis of ground water samples, should be changed to be consistent with the comments already made on subsections 2641(c)(2)(C) and 2641(c)(4)(B). The requested change would give the local agency the discretion to determine if periodic laboratory analysis is necessary. That change could be accomplished by substituting the word "may" for the word "shall" in the final sentence of subsection (F).

(6) <u>2641(c)(8)</u>

In the comments WOGA submitted to the Board on November 27, 1984, at pages 15-16 WOGA urged the Board to include an alternative monitoring method for all owners or operators of underground storage tanks that would allow the local agency to approve a delayed compliance schedule for installation of a complete set of monitoring requirements when it could be shown that implementation of such requirements would be impossible by the July 1, 1985 deadline. WOGA wishes to repeat that comment here. We strongly believe that a phased-in compliance schedule for owners or operators of underground storage tanks that are unable to implement a complete set of monitoring alternatives because of lack of material or a lack of availability of professional expertise is reasonable. This alternative could require tank testing and inventory reconciliation at a minimum during the phase-in period.

(7) <u>2641(d)</u>

WOGA continues to believe that this entire subsection should be dropped. It sets forth criteria which are to be used by the local agency in evaluating proposed monitoring alternatives for a specific facility and it thereby removes discretion from the local agency that was clearly given to it by the statute. (<u>See</u> Health & Safety Code § 25284.1(b) which states that alternative methods of monitoring "may be required by the local agency, consistent with the regulations of the board.") We also note that subsection (1) appears to directly conflict with the objectives in subsection 2640(b). The objectives in subsection 2640(b) state that ground water monitoring may be used as a primary means of monitoring in certain circumstances. However, subsection 2641(d) states that: "Whenever possible, a primary method of monitoring other than ground water monitoring shall be performed at a minimum." (Emphasis supplied.) The conflict is that ground water monitoring appears to meet the objectives of Article 4 by virtue of the statement in subsection 2640(b), whereas under the evaluation criteria in subsection 2641(d)(1), ground water monitoring appears to be disfavored. WOGA continues to believe that this entire subsection is unnecessary and the discretion to choose among monitoring alternatives should be left up to the local agency.

2643. Underground Storage Tank Testing

WOGA continues to believe that a subsection should be included within this section which governs the frequency of tank testing. The original draft of the proposed regulations set forth such a schedule for tank testing frequency which depended upon the tank material and the age of tank. WOGA believes the Board should adopt a schedule which requires an initial test within one year of permit issuance and then re-testing according to the following schedules:

1. Annual retesting for unprotected steel tanks greater than 10 years old; and

2. Annual retesting for cathodically protected and FRP tanks greater than 15 years old.

WOGA therefore urges the Board to adopt the original proposed schedule and to remove the requirements for annual testing in section 2641.

In addition, in order to be consistent, the requirements for annual tank testing in subsections 2641(c)(3)(E) and 2641(c)(5)(C) would be dropped, and those sections would simply reference the subsection in 2643 regarding frequency of tank testing. Finally, the references to tank testing frequency in Table 4.1 would also be deleted and reference made to section 2643.

2644. Inventory Reconciliation

(1) 2644(e)

This subsection requires the owner or operator to submit, on a quarterly basis, a statement to the local agency under penalty of perjury: (1) verifying that the data collected pursuant to the inventory reconciliation requirement is within allowable variations, or (2) submitting a list of the dates and variations that exceed the allowable variations. This requirement goes far beyond the statutory scheme in Health & Safety Code § 25284.1(b)(3), which simply requires that inventory records are to be kept on file for one year and are to be reviewed quarterly. WOGA believes that this requirement will create an unnecessary quantity of information that local agencies will be unable to process. A requirement that such data be available for local agency review would achieve the same goal at far less expense. WOGA suggests that this subsection be dropped for lack of necessity.

(2) 2644(f)(3)

This subsection sets forth one of the requirements to be performed by the operator or permittee if "inventory reconciliation indicates a loss of the hazardous substance greater than that specified." When such a loss occurs, this subsection would require "a complete review of all inventory records from the last time a zero condition of loss or gain existed." WOGA urges the Board to recognize the small but persistant imprecision in inventory reconciliation methods. WOGA's concern is that, in most cases, the last time a zero loss or gain condition exists will be the first time inventory records were kept. WOGA suggests a better requirement would be "a complete review of all inventory records from the last time a loss or gain of a hazardous substance was recorded which was greater than that specified in the regulations." If such a loss occurred in the past a complete review of the prior inventory records would have already been undertaken and would be unnecessary to repeat.

2645. Soil testing

Subsection (k) of this section sets forth requirements for the analysis of soil samples. WOGA is still concerned that this requirement obligates the owner or operator to search for past leaks, completely unrelated to current operations of the underground storage tank. Once again, while WOGA agrees that this is a laudable goal, WOGA disagrees that these regulations are the proper mechanism to accomplish this goal. Health and Safety Code § 25284.1(a) states that the monitoring system for existing underground storage tanks shall be "capable of detecting unauthorized releases of hazardous substances stored in the facility. . ." This clearly refers to present tense storage or future storage, since the term "unauthorized release" means a release that does not conform to the provisions of the statute, which became effective on January 1, 1984. These regulations were simply not meant to require a search for past releases.

For example, subsection 2645(k) requires that if "the use of the underground storage tank has historically changed, then analysis shall be for at least one constituent from each period of use." In addition to the inconsistency of this language with the statutory mandate, this requirement is unreasonable since in some cases it may be impossible to determine what prior constituents were contained in an underground storage tank. This may be the case if a facility has been in existence for a long time or if the facility has changed ownership. WOGA asks that the Board restrict soil analysis to analysis for those constituents present in the underground storage tank. This could be accomplished by changing the words "have been" in the first sentence of this subsection to "are" and deleting the second sentence of the subsection.

In subsection (m), we believe that the words "from an underground storage tank" should be inserted as follows:

> "If soil analysis indicates that an unauthorized release from an underground storage tank has occurred, the permittee shall report the release pursuant to Article 5 of this subchapter and shall repair or close the underground storage tank pursuant to Article 6 or 7 of this subchapter."

This will clarify that the regulation is directed toward unauthorized releases from underground storage tanks.

2648. General Construction and Sampling Methods

Subsection (p)(3) requires that exploratory boring wells shall be drilled to "first perennial ground water or to a minimum depth of 100 feet." WOGA believes that, consistent with its comment regarding subsection 2641(c)(3)(A), requiring exploratory boring to 100 feet is unnecessary. WOGA presented both written and oral comments supporting its proposal. See, for example, the Harding Lawson report accompanying the WOGA comments submitted on October 23, 1984. By contrast, the Board's staff has not refuted WOGA's supporting documentation nor have they offered data to support the 100 foot figure. Fifty feet should be sufficient.

Article 6

2661. Repair Evaluation

Subsection (c)(2)(A) of this section requires that for fiberglass tanks a "special inspector shall take interior diameter measurements and, if the cross-section has compressed more than 1 percent of the original diameter, the underground storage tank shall not be certified and shall also not be returned to service." In discussions with manufacturers of underground storage tanks made of fiberglass, WOGA has learned that it is common industry practice to repair such tanks unless a 2 percent compression of the original diameter is observed. It is WOGA's understanding that manufacturers of such tanks are preparing written comments to support this figure and those comments are expected to be submitted during the current public review period. WOGA believes that if the current regulatory language is maintained, a number of fiberglass tanks may be removed unnecessarily. WOGA asks that the Board adopt a 2 percent criteria instead of a 1 percent criteria.

Conclusion

WOGA appreciates this opportunity to comment on the proposed Subchapter 16 regulations.

ERRATA SHEET

2632. Monitoring Standards for New Underground Storage Tanks

Subsection 2632(d)(2)(A) does not make any sense as it is currently written. That subsection ends with the following language: "If not permanently on-site, and an equipment the equipment located on-site." WOGA asks that the Board clarify the language in this regulation.

2633. Construction Standards for New Motor Vehicle Fuel Underground Storage Tanks

Subsection 2633(c) also needs clarification in a similar manner as that noted in the prior comment. It appears that language in that subsection which was included in the prior draft of the proposed regulations was simply left out in the current draft. If so, the subsection should read:

> "Primary containers used for the underground storage of motor vehicle fuel and constructed of materials other than those specified in Section 2633(b) shall be subject to the requirements of Sections 2631 and 2632 of this article."

2635. General Construction Standards

(1) Subsection 2635(b)(4) -- In the last sentence of the first paragraph, the first word, "underground," should be capitalized.

(2) Subsection 2635(b)(5) -- The first line should probably be: "All primary containers and double-walled underground storage tanks . . .," instead of the language in the proposed regulation.

(3) Subsection 2635(b)(7) -- The next-to-last sentence should begin: "In lieu of the above, a test using accepted . . ." instead of the language in the proposed regulation.

2641. Monitoring Alternatives

(1) 2641(c)(5)

Subsections (B)(ii) and (iii) should both reference "(iv)" instead of the current reference to "(v)." In addition, in subsection (D) the word "visual" is misspelled in the second sentence.

(2) 2641(c)(6)

Subsection (D), for clarity, should read as follows:

"All pressurized pipelines and suction pipelines shall be monitored as provided for in subsection (5)(D) of this subsection."

2645. Soil Testing

In subsection (j), WOGA notes that the word "manufacturer" is misspelled in the second sentence.

#87j. DH

Western Oil and Gas Association
727 West Seventh Street, Los Angeles, California 90017
(213) 627-4866

May 29, 1985

Mr. David Holtry
The Division of Water Quality
State Water Resources Control Board
Post Office Box 100
Sacramento, California 95801-0100

Re: Amendments to Subchapter 16 Regulations

Dear Mr. Holtry:

The Western Oil and Gas Association ("WOGA") appreciates this opportunity to comment on the May 14, 1985 proposed changes to the Subchapter 16 regulations governing underground storage of hazardous substances. WOGA's main concern is that all of the issues raised by the Office of Administrative Law ("OAL") in their April 2, 1985 notice of disapproval of the regulations still have not been adequately addressed.

First, OAL noted that "the Board failed to summarize and respond to approximately 300 comments, as required by Government Code section 11346.7(b)(3)." The OAL's Disapproval Opinion does not specifically list all 300 comments so it is unclear whether some of WOGA's comments were included in the comments not adequately summarized or responded to by the Board. However, we believe a number of WOGA's comments were not addressed by the Board and that they must be in order for the proposed regulations to be valid. For example, WOGA remains concerned that the proposed regulations remove discretion from the local agency implementing the regulations regarding the location and number of ground water monitoring wells, and the depth and sampling frequency of such wells. WOGA also commented extensively on the need to allow ground water monitoring as a primary means of monitoring, especially in cases where the ground water is very shallow. As far as we know, this comment has never been addressed by the Board. Finally, throughout WOGA's participation in this rulemaking, we have noted that the Board should allow the local agency to approve monitoring alternatives different from those set forth in the proposed regulations. So long as a different alternative will afford equivalent protection to the ground water, such flexibiity is required by California Gov't Code § 11340.1 (which requires performance standards whenever possible). We

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MAY 29 1985

do not believe there has been an adequate response to this comment.

Second, OAL disapproved the proposed regulations because there was no demonstration of "substantial evidence" for the necessity of a number of sections. Proposed sections 2641(c)(4), 2641(c)(5), 2641(c)(6), 2641(c)(7) and 2641(c)(8) were among those sections listed. Throughout our comments, WOGA has identified a number of issues associated with these subsections. For example, subsection 2641(c)(6) requires inventory reconciliation, tank testing, pipeline leak detectors, soil samples and either vados zone monitoring or ground water monitoring. The tank testing required by this subsection would be on an annual basis. WOGA believes the Board cannot demonstrate by substantial evidence the necessity for annual tank testing (which is estimated to be approximately $1,500 to $2,000 per year for a typical service station) in addition to the other monitoring requirements already imposed by this alternative. We will not repeat our comments on the other subsections cited above. However, we note that in the May 14 notice, there is no mention of any proposal to change these subsections. We must assume, therefore, that the Board intends to demonstrate by "substantial evidence" the necessity for these regulations as originally promulgated. In fairness to the regulated community, such a showing should be made <u>prior</u> to adoption of the proposed regulations. Since we have argued all along that many of these subsections, or portions of these subsections, were unnecessary, we would like to be informed of the Board's justification.

Third, another subsection listed by OAL as lacking substantial evidence of necessity was subsection 2642(b)(4), which would preclude from visual monitoring those tanks located "at a facility which is not staffed on a daily basis." If visual monitoring cannot be implemented, then one of the alternatives in proposed section 2641 must be utilized. WOGA has already commented that numerous service stations are not staffed on a daily basis and, in the case of service stations associated with car washes, may not be staffed over a number of days. The regulations should allow for discontinuities in visual monitoring. Nevertheless, even though OAL identified this subsection as one requiring a showing of necessity, the Board's staff has chosen not to propose any changes. We assume, therefore, that substantial evidence will be forthcoming and ask that it be released to the public prior to the adoption of the amended regulations.

Fourth, subsection 2642(c)(4), also identified by OAL as requiring a further demonstration of substantial evidence of necessity, requires that a record be kept of the visual observations made of an underground storage tank. In past comments, we have disagreed with the need for this added layer of regulatory compliance. We agree that if there is evidence of leakage, the local agency should be notified; however, daily recording of visual inspections, when there is nothing to report, is unnecessary.

Fifth, subsections 2648(q)-(s), also identified by OAL as potentially unnecessary, specify methods for sealing unused borings. These requirements parallel already-existing statutory requirements and remove the discretion of the on-site hydrogeological expert. Methods for sealing unused borings should be left up to the on-site expert. Since amendments are not proposed to these subsections, we must assume that "substantial evidence" exists for the necessity of these subsections, and we look forward to reviewing such evidence.

Sixth, subsection 2645(h), as amended by the staff, specifies methods for the laboratory analysis of soil borings. It states that composite samples may be used but requires that "any pollutant in a sample will not be diluted below detection limits by mixing with uncontaminated samples or samples that contain low concentrations of the pollutant." The quoted language would completely eliminate the ability to conduct composite sampling. Until samples are analyzed, it will not be known which samples are uncontaminated or which contain low concentrations of the pollutant. Therefore, we suggest that the underlined language at the end of the proposed subsection be deleted.

Thank you for your attention to these matters.

Very truly yours,

Robert Harrison /S/

Robert N. Harrison,
Assistant General Manager

RNH:cj

#88

State of California

Department of Developmental Services

Memorandum

To : HAROLD SINGER
Division of Technical Services
State Water Resources Control Board
901 "P" Street

Date : October 22, 1984

Subject: Comments for Public Hearing Regarding Regulations Governing Underground Storage of Hazardous Waste

Telephone: ATSS (8) 485-1306
(916) 445-1306

From : Hospital Operations Division
1600 - 9th Street, Second Floor

The following comments/issues are provided by this Department in response to the subject hearing on October 23, 1984:

(1) Proposed Title 23 C.A.C. Section 2610-2704 requires that all underground tanks storing hazardous materials be modified to detect or prevent leakage to the environment. The state hospitals do not have the funds to comply with this law which requires immediate action.

It is requested that the State Water Resources Control Board work with the Department of Finance to identify funds for accomplishing compliance.

(2) Article 1, of the proposed regulations gives counties the implementation of the subject regulations. Currently, counties do not have jurisdiction over state facilities regarding construction type permits, building inspections, or other related items.

It is requested the proposed regulations be modified to provide a state agency jurisdiction over state-owned facilities for the purposes of compliance.

Douglas Yee of my staff will be attending the hearings to further discuss the above issues. Should you have any questions regarding this matter, contact Mr. Yee at 323-0234.

Douglas Yee
for MIKE KOESTER, Chief
Facilities Planning Branch

cc: D. Yee

MWK:DEY:sh

Leonard A Rea Subchapter 16 #89

COUNTY OF SACRAMENTO

Inter-Department Correspondence

October 22, 1984

To:
Lee Kenner, Probation
Jack White, Airports
Larry Beaver, Public Works Equipment Division
Mike Silvey, General Services
Doug Borges, Sheriff Department
George Nittka, Water Quality
Ellis Marvel, Maintenance & Operation
Rick Carunchio, Parks & Recreation
George Lynch, Solid Waste

From:
Len Rea
Building Design Section
Department of Public Works

Subject: MONITORING UNDERGROUND STORAGE TANKS

The following is a current review of the status of legislation regarding the monitoring of underground storage tanks.

The deadline for establishing a monitoring plan has been extended from July 1, 1984 to July 1985. The regulations being developed by the State Water Resources Control Board to implement AB 1362 are currently in draft form (see attached letter).

Although the proposed regulations exempt counties which have adopted an ordinance prior to January 1, 1984, the County will have to comply with article 3 and 4 of the State regulations as the minimum requirements.

Article 3 is "New Tank Construction and Monitoring Standards", and Article 4 is "Existing Underground Storage Tank Monitoring Criteria". Article 4 states: "The intent of monitoring existing underground storage tanks is to detect leakage before the hazardous substance reaches ground water... for this reason, multiple, nonduplicative systems as described in Section 2641 through 2646, shall be implemented where technically and practicably feasible."

The following is a summary of Section 2641-2646 with comments:

OFFICE 440-6651

LEONARD A. REA, P.E.
SENIOR MECHANICAL ENGINEER
BUILDING DESIGN

DEPARTMENT OF PUBLIC WORKS
COUNTY OF SACRAMENTO

827-7th STREET
SACRAMENTO, CA 95814

2641. Visual Monitoring

This would be exempt in most cases since our tanks are underground and cannot be seen.

2642. Underground Storage Tank Testing

A test method capable of detecting a hazardous substance loss of at least 0.05 gallons per hour is required. For unclad steel tanks without corrosion protection the test is required 10 years after installation and yearly thereafter. The test is complicated and sophisticated requiring calculations for vapor pockets, thermal characteristics of the stored material, temperature stratification in the tank, evaporation, pressure variations in the tank and deflection of tank ends.

The "Petro-Tite" leak test method is currently being used by some firms and should be acceptable.

2643. Inventory Control

This requires all tanks to have a daily inventory control system unless you can demonstrate that the hazardous substance is not susceptible to accepted technically available metering.

This is again complex and involves calculations before and after delivery. Microprocessor based controls are available which can be used. The installed cost is estimated to be $5,000 per location, which could include up to 8 tanks within 300' from the monitor.

2644. Soil Testing and Exploratory Boring

This requires slant boring to 50 feet below the midpoint of the tank, or vertical borings if slant boring is not possible, with soil samples every 5 feet to the bottom of the boring or to ground water level, whichever occurs first. All borings are required to be logged in detail "and the soils described according to the Unified Soils Classification System by a registered civil engineer or registered geologist competent in soils engineering or a certified engineering geologist."

The state of the art is not there on slant boring, so vertical wells will have to be acceptable. If there is evidence of hazardous substance then you have to go to Articles 5, 6, & 7 which have to do with Release Reporting Requirements, Allowable Repairs and Closure Requirements, respectively.

If a release is not detected, a leak detection monitoring system is required to be installed.

2645. Vadose Zone Detection Monitoring

This requires a vadose zone detection monitoring system. "The number, location and depths of vadose zone monitoring points shall be selected so as to give the earliest possible warning..."

This is a little vague, but indications are that 2 wells in the backfill would suffice. The monitoring is required to be continuous and connected to an alarm system, except weekly where continuous monitoring is infeasible.

"Vadose zone monitoring may consist of vapor monitoring or soil-pore liquid monitoring or a combination of both methods." Vapor well monitoring can be done using an "Inflatable Packer" in the well in conjunction with a gas chromatograph. Thermal conductivity sensors can be used for liquid detection. There is no mention in the regulations of what detection systems are acceptable.

The Cost for the above are estimated to range between $5,000 to $15,000 for an installation with 4 tanks at one location.

2646. Ground Water Leak Detection Monitoring

This is not required if a vadose monitoring system is implemented and the "ground water is and will be at least 5 feet below the invert of the underground storage tank." If the groundwater fluctuates above and below 5 feet, both vadose and groundwater monitoring are required. If above 5 feet, ground water monitoring will be the primary leak detection technique with vapor monitoring to be used where possible.

If ground water monitoring is required three groundwater wells spaced at 120° of arc extending to at least 10 ft. below the tank invert will be required. Monitoring will be required at least weekly from each well.

That covers 2641 thru 2646, but then they throw 2647 at you.

2647. Verification Ground Water Monitoring

This section states that you have to have a verification groundwater monitoring system unless ground water monitoring is used as the primary means of leak detection (2646); or, the highest groundwater is at a depth greater than 200 ft.; or it is physically impossible to drill within 500 ft.; or, soil conditions do not permit. Therefore, if the groundwater is below a depth of 5 feet below the tank invert 2646 says that you don't need groundwater monitoring but 2647 states that you have to install a groundwater system anyway, and the depth now stated has to be to the base of the aquifer or 100 ft., whichever is lesser. If the highest groundwater elevation is between 100-200 ft., a well is required to the base of the aquifer or 200 ft., whichever is lesser.

This all requires accurate determination of the groundwater level--either by existing wells within 500 ft. of the facility or exploratory boring using a dry drilling technique.

The cost for drilling to 200 ft. is estimated to be $15,000 to $20,000. This whole section is suspect and seems contradictory. Even if you detect a hazardous substance, it will be difficult to determine the source as it could be from a distant facility.

2648. Well Construction and Sampling Methods

This section covers precautions and safeguards to insure that the wells themselves do not create more hazards than the underground tanks. You can imagine what problems can be created with all these holes drilled into the ground which are direct avenues for contamination from other sources.

PROPOSED MONITORING PLAN

It should be emphasized that in the case of existing tanks, the owner of an older tank may find it more economical to replace a tank than to install a relatively expensive monitoring system. Since the economical life of a unprotected steel tank is predicted to be 15-25 years, all older tanks should be evaluated and as to the feasibility of replacing them verses the cost of implementing the regulations.

Therefore, the first step in establishing a monitoring program is to perform a site survey and obtain the historical and physical data on all tanks.

All tanks recommended for continued use will then be leak tested and soil samples taken. For those tanks recommended for closure or removal, and all abandoned thansk, it must be demonstrated that no unauthorized release has occurred, which can be done by leak detection, groundwater monitoring or soil sampling (preferably, soil sampling). Closure requirements will have to comply with Article 7 of the regulations.

A Facility Evaluation Report shall be made with cost estimates for each location. As a result of this, additional tanks may be recommended for repairs. Based on this above evaluation, the County will proceed with the implementation of the monitoring program to comply with the final adopted regulations and repairs, where recommended.

For those tanks that have or where soil samples indicate leaks, we are not home free by just removing the tank. The regulations require not only the removal or closure of the tank but clean up and restoration. If the aquifer is contaminated, the costs can be extensive. Let us hope we do not have any leaks.

The Facility Evaluation Report should be prepared by a qualified firm as should the installation of the implementation measures. It is proposed that the County prepare a RFP from firms capable of doing the above work showing their qualifications and proposed methodology. The RFP will state the minimum requirements based on the above.

In the next several months, I will be preparing in draft form the RFP. If you have any comments or suggestions, please call me at 6651. Of course, final action cannot be made until the State regulations are formally adopted.

LAR:st
Enclosure

Len Ren

cc: Bill Wanderer
Terry Tice
Francis Hodgkins
Bob Knight, Health Dept.

#90

WICKLAND
OIL COMPANY

October 23, 1984

State Water Resources Control Board
P.O. Box 100
Sacramento, California 95801

Attn: Mr. Harold Singer
Division of Technical Services

Subject: Comments on Proposed Underground Storage Tank Regulations

Dear Mr. Singer:

Wickland Oil Company ("Wickland") is an independent petroleum products marketer, at both the wholesale and retail level. It is a family-owned business which, among other things, operates approximately 80 self-service gasoline stations primarily in Northern California.

Wickland appreciates this opportunity to comment on the State Water Resources Control Board's proposed regulations to implement California's new underground storage tank statute (Health and Safety Code Sections 25280 et seq., as amended). Wickland has participated in the preparation of the California Independent Oil Marketers Association comments on the proposed regulations, and fully endorses those comments. The purpose of Wickland's own comments is simply to highlight a point which it considers to be the single most serious deficiency in the proposed regulations, namely, that such regulations ignore the statute's separate treatment of existing motor vehicle fuel tanks.

Health and Safety Code Section 25292 deals with actions to be taken for existing underground storage tanks. It mandates that the owner outfit his facility with a monitoring system capable of detecting unauthorized releases of hazardous substances. This is to be accomplished by visual inspection of the tanks, wherever practical, or by alternative monitoring methods as may be required by the local agency. The statute lists four possible alternative monitoring methods. The fourth alternative is specifically for tanks containing <u>motor vehicle fuels</u>. Section 25292(b)(4). For motor

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vehicle fuel tanks, the monitoring system can consist of "daily gauging and inventory reconciliation by the operator" if certain conditions are met. The Legislature's intent to establish separate requirements for motor vehicle fuel tanks could not be expressed more clearly.

Article 4 of the proposed regulations, however, completely ignores this special treatment of motor vehicle fuel tanks mandated by the statute. Instead, Article 4 (Section 2640) by implication lumps motor vehicle fuel tanks in with all other underground storage tanks and requires the monitoring system to be capable of detecting historic, as well as future, unauthorized releases, and to be capable of measuring ground water quality directly. It goes on to require multiple monitoring systems for all such tanks. Thus, Article 4 of the proposed regulations directly conflicts with the statutory mandate that inventory control be the only required monitoring system for motor vehicle fuel tanks.

Further, the statute speaks of "alternative" monitoring methods. Webster defines "alternative" as "...offering a choice between two or more things only one of which may be chosen" (emphasis added). Article 4, however, requires owners of existing motor vehicle fuel tanks to implement each of the various monitoring methods specified in Sections 2642 through 2647. Had the Legislature intended this result, it could easily have so stated.

Wickland proposes that the regulations be brought back in line with the clear intent of the Legislature. Specifically, Wickland proposes that a subsection be added to Section 2640 of the proposed regulations stating that operators of motor vehicle fuel storage tanks need only monitor those tanks through daily gauging and inventory reconciliation, as set forth in Health and Safety Code Section 25292(b)(4).

As a concluding matter, Wickland notes that several trailer bills (e.g., AB 3565, AB 3781) were recently passed by the Legislature amending the original underground tank statute. Obviously, the proposed regulations will have to be changed to conform to such amendments. Wickland is especially pleased with the addition to Health and Safety Code Section 25291(a)(6), which establishes that certain double-wall tanks meet the primary and secondary containment requirements for new tanks.

Respectfully submitted,

WICKLAND OIL COMPANY

By Richard R. Gray
Richard R. Gray
Corporate Attorney

RRG:js

90-C

WICKLAND OIL COMPANY

November 27, 1984

State Water Resources Control Board
Post Office Box 100
Sacramento, California 95801

Attention: Mr. Harold Singer,
Division of Technical Services

Subject : Comments on Proposed Underground Storage Tank Regulations

Dear Mr. Singer:

Initially, Wickland Oil Company ("Wickland") would like to compliment both the Board and Staff on their efforts to respond to the public comments made during the October 23, 1984, hearing, and the November 5, 1984, workshop on the proposed underground storage tank regulations. Wickland feels that the latest revisions to the proposed regulations represent a substantial improvement over the original draft.

Wickland has again participated in preparing the comments of the California Independent Oil Marketers Association ("CIOMA"), and fully endorses those comments. The purpose of this letter is to highlight what Wickland considers the key remaining problems with Article 4 of the regulations dealing with monitoring alternatives for existing tanks.

Specifically, Wickland submits that Alternative 5, which purports to give the owners of motor vehicle fuel tanks an inventory control option, is largely illusory. The proposed performance standards for inventory control are neither economically nor technically feasible. By suggesting such standards, the Staff, whether by design or inadvertence, is effectively forcing service station owners to drill monitoring wells (Alternative 6), or within a three-year period, to replace existing tanks with new tanks (Alternative 8). This, in turn, violates Health and Safety Code Sections 25284.1(b)(3), which mandates that motor vehicle fuel tanks be monitored by "daily gauging and inventory reconciliation by the operator" if certain conditions are met. Implicit in that code section is a requirement that any performance standards for inventory reconciliation be <u>reasonable</u>.

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owners and operators of
REGAL

The allowable inventory variations set forth under Alternative 5, however, would require electronic tank gauges, the cost of which was generally agreed at the November 5 workshop to be $10,000.00 for a typical service station. Wickland has approximately eighty stations; hence, a capital expenditure of at least $800,000.00 would be required. Wickland would be forced to spend this money, moreover, based almost solely on the Staff's assertion that this "state of the art" technology can, in fact, meet such performance standards. Experience under the Stage II vapor recovery program indicates that when regulations are ahead of technology, the results can be both frustrating and costly. Has the staff confirmed that "state of the art" technology actually works under operating conditions in the field over a protracted period? Wickland submits that this question should very definitely be answered in the affirmative before massive expenditures are required of service station owners all over the state.

Under the regulations as presently proposed, it is quite possible that economics will force Wickland, as a company, to opt for Alternative 8 which involves a written commitment to either shut down or replace all existing tanks within three years. Although Wickland thinks that a phase-in concept is admirable, the extremely large capital expenditures involved in installing new double-walled tanks require more than a three-year period. At a minimum, this period should be lengthened to seven years.

A phase-in option that would better benefit the environment, as well as industry, would be to allow a company seven years to shut down or replace its tanks if the company commits in writing to phase out its existing tanks at an annual rate at least equal to the total number of tanks divided by the total number of years in the prescribed period (e.g., a company that has 700 existing tanks could phase them out at the rate of 100 per year over a seven-year period). This would be better than the proposed three-year plan, which does not require an owner to phase out any of the existing tanks until the end of the three-year period.

Further, if a company is willing to put large sums of money into new tanks at a prescribed rate, it should not also be required to comply with costly interim measures. As more fully explained in the CIOMA comments, even the so-called "liberal" inventory variations of Alternative 6 (which are incorporated into Alternative 8) would repeatedly trigger costly "false positive" testing procedures. Wickland submits that, given the other layers of protection (annual tank testing, pipeline leak detectors), performance standards for inventory control under Alternative 8 should be eliminated entirely. If performance standards are deemed necessary at all, they should be far more liberal, for example, a one percent throughput error. Again, it boils down to a matter of providing strong incentives for a company to commit itself to installing the more costly new tanks.

In summary, Wickland submits that although many improvements have been made in the revised regulations, further revisions are needed to give the owners of existing motor vehicle fuel tanks a genuinely viable inventory control alternative, as mandated by the underground storage tank statute. Finally, given the substantial changes in the current draft, Wickland urges the Board to defer to a final decision on the regulations to a later date after it has had time to digest the public comments submitted on November 27th.

Respectfully submitted,

Daniel E Hall

DANIEL E. HALL
Vice President, Legal

DEH:RRG:klg

#90-E

WICKLAND OIL COMPANY

January 18, 1985

State Water Resources Control Board
Post Office Box 100
Sacramento, California 95801

Attention: Mr. Harold Singer,
Division of Technical Services

Subject : Comments on Proposed Underground Storage Tank Regulations

Dear Mr. Singer:

Wickland Oil Company ("Wickland") was dismayed to learn that the Staff, in its latest draft of the proposed underground storage tank regulations, left unchanged its treatment of existing motor vehicle fuel tanks. Specifically, the Staff chose neither to change the inventory control performance standards of Alternatives 5 and 6, nor the three-year phase in period for tank replacement under Alternative 8.

Alternatives 5 and 6 purport to give motor vehicle fuel tank owners an inventory control alternative, as mandated by the underground storage tank statute (Health and Safety Code Section 25284.1(b)(3)). Wickland's experience, however, is that the allowable inventory variations (in the 75-100 gallons per day range for a 10,000 gallon tank) are simply not attainable by the operator of a typical busy gas station acting in good faith. Given the inherent mechanical inaccuracy of "tank sticking", such an operator would repeatedly trigger the burdensome and costly evaluation procedures required when the standards are exceeded. Nor is there any new technology that has been proven in the field to eliminate this "false positive" problem.

Indeed, Wickland has come to the conclusion that the only way a service station operator could consistently "comply" with Alternatives 5 or 6 is to calculate what his inventory should be and manipulate his tank stickings to comport with those numbers. Obviously, this type of behavior is not conducive to amelioriating the problem of leaking underground storage tanks.

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owners and
operators of

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Consequently, Wickland has taken a long hard look at Alternative 8, which in its present form requires a tank owner either to shut down or replace existing tanks within three years. Alternative 8, however, has two key drawbacks. First, the three-year phase in period is too short. Wickland has approximately 80 service stations, and it costs about $75,000-$100,000 per station to bring existing facilities into compliance with secondary containment standards. An independent oil company the size of Wickland, in today's extremely competitive pricing environment, simply does not have the capital resources to convert all of its stations to secondary containment within three years. Second, the proposed regulations require the tank owner to comply with the Alternative 6 inventory control standards even during the three-year phase in period. This is so in spite of other interim layers of protection (e.g., annual tank testing, pipeline leak detectors).

Wickland requests that the Board modify Alternative 8 by adopting the phase in option attached to this letter as Exhibit A. Basically, this proposal calls for a seven-year phase in period, in which a tank owner would enter into a written, legally binding commitment to install pipeline secondary containment within the first three years (at the rate of one-third of the tanks per year) and to comply with tank secondary containment requirements over the next four years (at the rate of one-fourth of the tanks per year). The reason for giving a higher priority to pipeline secondary containment is that, in Wickland's experience, the most serious leaks are from lines, which are under pressure, as opposed to tanks.

As a trade off for the longer phase in period, interim protective measures would include: pipeline leak detectors; semi-annual tank testing until pipeline secondary containment is installed (annually thereafter); and daily inventory reconciliation, but without mandated variance standards. In our estimation, these interim standards result in a level of control and safety at least equal to Alternatives 5 and 6.

The real advantage of the attached proposal is that it gives a company the maximum incentive to install secondary containment, which is clearly the best long-term solution to the problem of leaking tanks. Scarce capital resources are not diverted to costly interim measures, but, rather, are concentrated where they can ultimately do the most good. Obviously, there is room for discussion of, and improvement upon, the specific points of the proposal. Wickland respectfully submits, however, that the basic concept behind the proposal not only makes sound economic sense, but also optimizes protection of the environment.

Sincerely yours,

Richard R. Gray

RICHARD R. GRAY
Corporate Attorney

RRG:klg
Attachment

EXHIBIT A

Proposed Amendment to Alternative 8

1. Installation of pipeline leak detectors immediately.

2. Installation of pipeline secondary containment at all stations during years 1 through 3; 1/3 of stations per year.

3. Compliance with tank secondary containment requirements during years 4 through 7; 1/4 of tanks per year.

4. Tank testing required semi-annually until pipeline secondary containment is installed. Thereafter, tank testing required once per year until tank secondary containment requirements are met.

5. Daily inventory reconciliation, without mandated variance standards.

6. If a station is scheduled for closure within 5 years, it can continue to operate subject to immediate installation of pipeline leak detectors and compliance with semi-annual tank testing and daily inventory reconciliation without mandated variance standards.

7. All of the above to be incorporated into a binding written commitment signed by the tank owner.

Under the above program, by the end of the seventh year, all tanks and pipeline systems will have been either permanently closed or brought into compliance with secondary containment standards.

Original Comments 91-100

Index to Rulemaking File Underground Storage Tank Regulations Title 23, Waters Division 3, Water Resources Control Board Chapter 16, Underground Storage Tank Regulations <u>1985</u>

Subchapter 16
91

The Metropolitan Water District of Southern California

Office of the General Manager

State Water Resources Control Board
Division of Technical Services
Post Office Box 100
Sacramento, California 95801

Attention Mr. Harold Singer

Gentlemen:

Underground Tank Storage of Hazardous Materials
MWD Recommendations Regarding AB 1362

The Metropolitan Water District of Southern California (MWD) is very interested in issues relating to protection of underground water resources of California. The State Water Resources Control Board (SWRCB) working session on September 24, 1984, was attended by a District representative. During the working session, a draft of the proposed regulations to be used as a basis for implementing AB 1362, "Underground Tank Storage of Hazardous Substances," were explained by the SWRCB panel.

Estimates indicate that 70 percent of the underground tanks that will be affected by AB 1362 are located in Southern California. Undoubtedly a large number of these tanks are in the District's 4,900-square-mile service area with a population of some 12 to 13 million. As a result, our member agencies and service area will be greatly affected by both the degree of success attained by the proposed regulations and the cost of compliance.

AB 1362, as it exists, allows County and City governments to form and enforce local regulations provided they are at least as stringent. This feature of AB 1362 should be amended to state that only one set of regulations shall be used throughout the State. This would eliminate confusion when seeking permits for underground tanks and would serve to achieve uniform compliance throughout California.

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It is felt that tanks owned and operated by Public Utilities and Agencies should be covered by a separate category. Less stringent regulations are needed for these tanks because they are normally monitored on a regular basis and maintained in a "leak-free" condition.

We have prepared the attached list of recommendations relating to AB 1362 for your Board's consideration, listing proposed changed and/or additions to the law and the reasons for the proposals.

Very truly yours,

Carl Boronkay

Carl Boronkay
General Manager

HEM/ms

Enclosure

STATE WATER RESOURCES CONTROL BOARD UNDERGROUND TANK STORAGE OF HAZARDOUS MATERIALS - MWD RECOMMENDATIONS REGARDING AB 1362

In the interest of both protecting Underground Water Resources of California and not placing unnecessary financial burdens on the people of California, it is requested that the following recommendations be considered for incorporation into SWRCB regulations implementing AB 1362.

General

Recommendation:

AB 1362 should be amended to also include "farm" tanks.

Reason:

Leakage from farm tanks would be as contaminating to underground water as leakage of the same material from a "non-farm" tank.

New Tanks

Regulations covering new tank construction are generally acceptable with the following exceptions:

Recommendation:

Dual wall steel tanks should not be approved for use.

Reason:

Liquids accumulating within annular space of dual wall steel tanks could precipitate corrosion which would be difficult to control and would likely result in tank failure if not properly dealt with.

Recommendation:

Section 2634(d)(2) "Daily loss or gain of 50 gallons or" daily should be defined as "each regular work day of no less than four days each calendar week."

Reason:

Many semi-public and public agencies as well as industrial users, staff installations only on four or five days each calendar week. Monitoring seven days each calendar week would increase costs for maintaining this program.

Recommendation:

Section 2635(h)(2) delete "or fiberglass reinforced plastic coatings."

Reason:

All types of applied coatings are subject to "voids or holidays" and/or damage. Accelerated corrosion will occur to exposed carbon steel portions of the tank at "voids or holidays" when installed in an environment conducive to corrosion. Therefore, it is important that carbon steel tanks or tanks with carbon steel components be cathodically protected.

<u>Existing Tanks</u>

Recommendation:

A separate category should be established for existing tanks owned and used by Public Utilities and Agencies for non-resale purposes.

Reason:

In most cases tanks owned and used by Public Utilities and Agencies for non-resale purposes experience limited product turn-over. By utilizing monitoring requirements outlined below any leakage would be quickly detected.

Recommendation:

Monitoring requirements for tanks owned and used by Public Utilities and Agencies for storing non-resale materials should consist of:

1. Sample soils at five-foot-depth intervals by vertical drilling within 5 feet on one side of each tank at midpoint (end to end) to a

depth of 25 feet below the bottom of the tank. Diameter of the test hole should be large enough to accept a minimum 4-inch diameter perforated PVC casing. Analyze soils samples to detect the presence of any and all different hazardous materials that have been stored in the tank. Case and cap bore holes and utilize as dry wells for periodic monitoring to detect any future leakage. In the event groundwater elevation is above the bottom of the soil boring hole, the cased holes should be utilized for groundwater monitoring.

2. Hydrostatic or pressure test each tank utilizing an approved method that will detect leakage of 0.05 gal/hr or more. Thereafter, test cathodically protected steel tanks that have been installed 15 years or more at least once each 3 years and test fiberglass reinforced plastic tanks that have been installed 5 years or more at least once each 2 years, or, at any time product inventory control measurements or dry well or groundwater monitoring indicates possible leakage.

3. Complete inventory control each normal workday (minimum of 4 days each calendar week).

4. Install, operate, and monitor cathodic protection systems for steel tanks, coated or uncoated, under the direction of a registered Corrosion Engineer or NACE Accredited Corrosion Specialist. Complete up-to-date information including drawings showing anodes and equipment, exact locations and monitoring data must be kept on file by the owner and readily accessible for immediate inspection.

Reason:

The above listed methods of monitoring and corrosion protection will provide adequate leak detection and prevention assurance for tanks storing non-resale materials.

Recommendation:

A final compliance date of three years minimum from date the regulations become effective should be allowed.

Reason:

This is required due to the enormous amount of work to be done throughout the State in order to comply with the regulations.

Recommendation:

Vadose zone monitoring equipment be tested by the State and a listing of approved equipment and systems be included with the finalized version of AB 1362.

Reason:

This will assure that Vadose zone monitoring systems are available that will satisfy the requirements of AB 1362.

It is further recommended that tanks storing hazardous materials for resale or commercial purposes be covered by the draft regulations with amendments as outlined by the SWRCB panel on September 24, 1984.

91-13

November 26, 1984

State Water Resources Control Board
Division of Technical Services
Post Office Box 100
Sacramento, California 95801

Attention Mr. Harold Singer

Underground Tank Storage of Hazardous Materials
MWD Recommendations Regarding AB 1362

The State Water Resources Control Board (SWRCB) Underground Tank Regulations dated November 9, 1984 were reviewed. Several items could be changed that should enhance and/or not adversely affect the overall effectiveness of the regulations. In general, the regulations concentrate on detecting leaks and do not place enough emphasis on preventing leaks by utilizing available expertise in fields of engineering, material selection and corrosion prevention.

Recommended changes in the regulations are as follows:

Article 3, New Tank Construction

(a) Steel tanks clad with glass fibre-reinforced plastic should be classified in the same catagory as steel tanks, coated or uncoated, which are required to have cathodic protection. Glass fibre-reinforced plastic cladding, as all other types of applied coatings can have voids and is susceptible to damage during handling and installation the same as steel tanks with conventional type coatings. Without cathodic protection, exposed carbon steel will corrode, often at an accelerated rate.

(b) Double wall tanks of steel construction are susceptible to corrosion in the annular space (exterior surfaces of the primary container and interior surfaces of the secondary container). Corrosion to these surfaces would be difficult to control without affecting the dual containment feature of this type

Sorry for the written additions. Time did not allow having the comments retyped.

W.E. Risner
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W. E. Risner

tank. It is recommended that allowing the use of dual wall steel tanks be reevaluated.

Article 4, Existing Underground Storage Tanks

(a) Monitoring requirements for existing tanks require initial tank testing and annual testing thereafter. Estimated costs for each test is $250 to $350. This will result in a considerable yearly cost for maintaining tanks. It is felt that initial testing to assure that a tank is not leaking and subsequent testing at 5-year-intervals coupled with inventory control monitoring AND CATHODIC PROTECTION is sufficient to insure that ~~a~~ STEEL tank is not leaking. Should inventory control monitoring indicate a probable leak during the 5-year-period, a tank test can then be made. This is especially applicable to standby generator fuel storage tanks. It is recommended that requirements for testing standby generator tanks be changed to specify testing at intervals not less than 5 years FOR CATHODICALLY PROTECTED STEEL TANKS unless inventory control monitoring indicates a probable leak.

(b) The regulations do not require cathodic protection for existing steel tanks and piping as a leak prevention feature. Preventing leaks is the most effective and economical method for protecting underground water rather than waiting for a leak to occur and then making tank and/or piping repairs (if allowable) and cleaning up contaminated soils. Corrosion is the predominate cause of tank and piping leaks. It is recommended that cathodic protection, a proven method of controlling corrosion, be required for all existing steel tanks and piping.

It is requested that these comments be considered by the SWRCB for incorporation into the final regulations.

Very truly yours,

W. E. Risner

W. E. Risner
Corrosion Engineer
The Metropolitan Water District
of Southern California

WER/lf

The Metropolitan Water District of Southern California

Box 54153, Los Angeles, California 90054

#91

State Water Resources Control Board
Division of Technical Services
Post Office Box 100
Sacramento, California 95801

Attention Mr. Harold Singer

9LC

Additional Comments on Adoption of Regulations
Concerning Underground Storage of Hazardous Substances
Subchapter 16 of Chapter 3 of Title 23 of the
California Administrative Code

a. Amend the definition of "daily" in Sections 2632(c)(2)(B), 2634(d)(1), and 2644(c) to be "daily is defined to be everyday of the normal workweek except on recognized State and/or Federal holidays." This will allow the same latitude to companies who have implemented a 4-day workweek to conserve fuel and mitigate traffic as is being given to companies on a 5-day week. Companies on a 4-day week should not be penalized for their efforts to reduce traffic and fuel consumption.

b. Amend Table 4.1 alternative 5 to change the requirement for tank testing to bi-annual or more if inventory reconciliation is being performed and indicates no leaks and cathodic protection is applied to inhibit future leaks. The requirements for annual tank testing places excessive financial and administrative burden on tank owners if no leaks are indicated by initial tank testing and no leaks are indicated by inventory reconciliation.

c. Revise Table 4.1 alternative 6 to eliminate the requirement for Inventory Reconciliation. Initial and annual tank testing, soils analysis, and vadose zone or groundwater monitor which will provide leak detection on a daily basis should be sufficient. Inventory reconciliation is overkill.

d. Section 2641(c)(5)(B)(ii) and (III) needs revision to clarify the intent of (ii) and (iii).

e. Revise Section 2641(c)(6)(A) and (B) to eliminate the requirement for inventory reconciliation. See c. above

f. Revise Section 2641(c)(7)(B)(ii) to eliminate the sentence "No inputs or withdrawals shall occur during these periods." Inasmuch as most standby emergency generators start automatically it would be impossible to guarantee that an emergency generator would not start during any five-day period.

91-C

g. Revise Section 2641(c)(7)(B)(iii) to eliminate the requirement for annual tank testing.

h. Revise the sentence in Section 2644(f)(3); "The operator shall have performed by a qualified person, a complete review of all inventory records from the last time a zero loss or gain condition existed," be revised to read "...inventory records indicated a loss or gain within allowable variation." Considering the inherent errors in inventory reconciliation it would not be realistic to expect that a period of zero loss or gain would ever occur.

i. Revise Section 2648(p)(3) to eliminate the requirement for having to drill to first perennial groundwater for alternative 5 inasmuch as it is not specified in Table 4.1 nor in the text for alternative 5.

91-C

The Metropolitan Water District of Southern California

Office of the General Manager

JAN 16 1985

State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, California 95801-0100

Attention Mr. Michael A. Campos
Executive Director

Gentlemen:

Underground Tank Storage of Hazardous Materials
MWD Recommendations Regarding AB 1362

The State Water Resources Control Board Underground Tank Regulations dated December 28, 1984, were reviewed by The Metropolitan Water District of Southern California. Two items could be changed in a way that would not impair the effectiveness of the regulations but would lessen the burden of compliance.

Recommended changes in the proposed regulations are as follows:

Article 4, Existing Underground Storage Tank Monitoring Standards
Section 2643, Underground Storage Tank Testing

Recommended Change

Annual tank testing should be changed to once each five years for steel tanks and piping that are cathodically protected.

Reason for Change

Daily inventory reconciliation or weekly gauging will detect any leakage. It is known that corrosion is the major cause of steel tank and piping leaks. Comments presented at previous hearings included evidence of the long-term effectiveness of cathodic protection to prevent underground fuel leaks from steel tanks and piping in a particular Southern California city.

91-c

The Metropolitan Water District of Southern California

Article 4, Existing Underground Storage Tank Monitoring Standards
Section 2641(7)(B)(ii), Monitoring Alternatives

Recommended Change

The time period should be extended to at least seven-day intervals and stipulate when an emergency generator has operated in the time interval since the last measurement, that fuel withdrawal be based on: (a) the equipment manufacturer's fuel consumption data, (b) fuel consumption rate determined by the owner/operator, or (c) where possible, in-line fuel consumption meters should be used to calculate fuel consumed for inventory reconciliation purposes.

Reason for Change

Five-day time intervals would require tank gauging a minimum of twice weekly and possibly more frequently should the emergency generator operate. As now written, daily gauging, not weekly as shown in Monitoring Alternative 7, would be required to comply with the regulations. Allowing the use of fuel consumption calculations or meter readings with gauging for inventory reconciliation will make it possible to comply with gauging requirements of Monitoring Alternative 7 as written.

Changes to the Underground Tank Storage of Hazardous Materials regulations as shown above will serve to make compliance less difficult and will not impair effectiveness of the regulations.

Very truly yours,

R. A. Dough
for Carl Boronkay
General Manager

WER/mm

Supchapter-16
#-92

REFINERS · MARKETERS · PETROLEUM PRODUCTS

BEACON OIL COMPANY 525 WEST THIRD STREET, HANFORD, CALIFORNIA 93230
AREA CODE (209) PHONE 582-0241

October 22, 1984

State Water Resources Control Board
P. O. Box 100
Sacramento, California 95801

ATTENTION: Harold Singer
Division of Technical Services

RE: Adoption of Proposed Regulations Governing Underground Storage of Hazardous Substances

Dear Mr. Singer:

We appreciate this opportunity to comment on the proposed regulations governing underground storage of hazardous substances (regs). We have been keenly aware of the proposed regs and have followed them closely in all their various forms. The proposed regs will effect approximately seventy of the one hundred and fifty four retail stations Beacon owns or operates, the remainder stations being covered under local ordinances. The monitoring cost of compliance to the regs, as drafted, will exceed $1,000,000.00 during the first year alone. Add to this the cost of compliance in communities that have already adopted similar laws and any costs that may pertain to the clean-up of historical spills. These costs could very well be catastrophic to an independent oil company, even the size of Beacon Oil.

Beacon Oil certainly wants to do their part in maintaining clean water and will comply to the recently passed Underground Storage of Hazardous Substances Act ("Act"). However, in our opinion, the proposed regs go far beyond the jurisdiction granted to the Board by the Act.

As members of California Independent Oil Marketers Association ("CIOMA") and the Western Oil and Gas Association ("WOGA"), we had the opportunity to study and comment on their formal comments and alternatives in great detail. Both of these organizations have done an excellent job in critiquing the proposed regs and we support their comments and alternatives one hundred percent. For us to comment in detail on the proposed regs would only provide you with duplicated testimony. However, at the risk of being duplicative, there are some specific areas we feel we must comment on.

To begin with, compliance must be accomplished by July 1, 1985, yet the fiscal impact study prepared by the State allows for a five-year implementation. The six-month time frame for compliance is unrealistic and does not allow for alternatives to be considered, let alone implemented. A five-year implementation will provide for a more reasoned and orderly implementation without an unduly disruptive financial impact.

One section of the proposed regs states that one of the objectives of the monitoring program is "to determine if unauthorized releases have occurred in the past". In another section, the proposed regs state that the soil-testing requirement is expressly designed "to determine if prior usage of the underground storage tank has resulted in an unauthorized release." In contrast, the main section in the Act relied upon by the Board as authority in the proposed regs, speaks only of "a monitoring system capable of detecting unauthorized releases" of hazardous substances. Nothing is stated in the Act regarding past or historical unauthorized releases. The cost to clean up even minor historical releases which pose no threat to the underground water supply <u>can easily run into the tens of thousands of dollars</u>. This expansion of the Act's intent is clearly unjustified.

The Act statute regarding monitoring of tanks installed prior to January 1, 1984 allows for "Alternative methods of monitoring the tank on a monthly or more frequent basis that may be required by the local agency." The Act clearly provides that <u>one</u> of a number of monitoring methods be implemented. For example, Section 25284(a)(7) refers to meeting "the" alternative method in Section 25284.1(b)(3), not all of the possible monitoring methods. However, the proposed regs list a number of monitoring methods, all of which are required for existing tanks...<u>again very expensive and clearly not what was intended by the statute</u>. Examples such as these are throughout the proposed regs.

While none of us want to contaminate the underground water supply, the proposed regs go far beyond the jurisdiction granted to the Board by the Act. <u>These regs impose unnecessary costs that can threaten the financial survival of all of us</u>.

Very truly yours,

BEACON OIL COMPANY

D. E. Bacigalupo
President

DEB:bl

#93

County of FRESNO

Department of Health

Donald R. Rowe
Director

DATE: October 22, 1984
TO: Harold Singer
FROM: Lynn E. Johnson
SUBJECT: Comments on Draft of Underground Tank Regulations

We agree with the intent of the regulations in regards to the monitoring of underground tanks. However, we feel the regulations are excessive in that it's unnecessary to require vadose monitoring, ground water monitoring, and soil sampling.

Our primary concern is the effort put forth is addressing historical leakage problems. It's our position that all existing tanks should be tested for leakage that vadose zone monitoring be utilized as leak detection in conjuction with product reconciliation.

LJ:bjm

Article 3, Section 2631 (c)

Who determines if secondary containment will contain the substance for the required period? Request addition of language similar to the following at end of paragraph (c)..."as determined by the local agency on the basis of information provided by the manufacturer.

Article 3, Section 2632 (e) (1)

The sentence beginning "All standing liquid...to best detection limits to determine...should be reworded..."to detection limits acceptable to the local agency". The term "best detection limits" is ambigious, and if it is meant to imply analysis to the lowest currently achievable detection limits, it is excessive and unnecessary for most substances.

Article 3, Section 2632 (f)

Considerable evidence exists that typical pressure loss leak detectors often fail to operate properly, especially if untested. The local agency should have the option of requiring pressure loss type leak detectors to be tested annually and/or requiring the installation of a bypass line with valve and pressure gauge at one of any number of pumps served by a pressure loss detector. This inexpensive addition to the system will allow the leak detector to be tested at any time by the owner or the local agency.

Article 3, Section 2634 (e)

We believe the time periods set forth in this section for the required steps an operator must take in case of a possible leak are appropriate and generally achievable.

Article 3, Section 2635 (b) (7)

This requirement is essential to the effective operation of any secondary containment system.

Article 3, Section 2635 (f)

The local agency should be able to require simple overfill devices such as product-tight fill boxes and float check valves, regardless of Section 2635 (g).

Article 3, Section 2635 (g) (2)

The requirement of available capacity of at least 110% of volume to enter tank provides a reasonable safety factor.

Article 3, Section 2635 (h)

Does this mean the local agency has the option of requiring a report from a registered corrosion engineer, or that every tank installation should be accompanied by such a report? This needs clarification.

Article 4, Section 2640 (a)

Sentence 3 should be stated as..."and in most cases be capable of measuring the ground water quality directly."

It is not always possible or reasonable to measure ground water quality directly, i.e., when an unpotable aquifer exists at a great depth.

Article 4, Section 2642 (d)

Note that Section 2634 (a) (3) requires testing of newly secondary contained tanks every two years. This section allows tanks with a much higher probability to remain untested for many years. Both Category A and Category B should include the statement, "or as required by the local agency" in the description of their respective testing requirements.

Also, double wrapped asphalt coated tanks should not be considered corrosion resistant.

Article 4, Section 2644 (d)

This does not make sense. A verticle boring will never be directly below the tank invert. Also, delete the 50 foot requirement. Depth of drilling will depend on depth to water table or appropriate depth for monitoring system used.

Article 4, Section 2644 (e) (4)

Since several borings may be made in relatively small areas, the requirement for logging and classifying soils in every boring is excessive and an unreasonable financial burden on the owner.

Logging and soil classification should be performed at the discretion of the local agency.

Article 4, Section 2647

Local agencies should be given more discretion in requiring or approving various aspects of an assurance ground water monitoring program.

Whether or not ground water is potable should be considered in the requirements for implementation of a groundwater monitoring program.

Article 4, Section 2647 (c)

Sampling should be done at water surface for substances which accumulate there.

Subchapter 16
#94

McCORMIX CORP.
Wholesale petroleum and chemical products

22 North Salsipuedes Street
P.O. Box 848
Santa Barbara,
California
93102
(805) 962-5888

October 23, 1984

State Water Resources Control Board
P.O. Box 100
Sacramento, California 95801
Attn: Harold Singer
Division Of Technical Services

I wish to thank the board for the opportunity to summit comments on the proposed regulations for the storage of hazardous substances of Sub Chapter 16 regulations.

I am Bert Mc Cormack, President of Mc Cormix Corporation of Santa Barbara, which is a petroleum jobbership in Santa Barbara, California. I'm here today to represent not only my Corporation as well as 1,500 commercial, industrial, and agricultural accounts in the Santa Barbara area that we serve. In fact we are the only remaining bulk plant left out of nine in Santa Barbara. A few years ago the Major Oil Companies decided that plant of our size were not economically feasible for them of operate. Since then, they have only delivered to accounts that can take full truck and trailer deliveries 8,000 gallons or more.

Continue

Before I go any further, I would like to clearly state that no one is more concerned about the environment than I am, and I know that none of us in this room today wants to contaminate any of our drinking water. I firmly believe that some kind of regulation is long over due. However, the proposed guidelines of Sub Chapter 16 Underground Tank Regulations is not the way to solve our problem. I feel that is is the most devasting regulation that I have ever read. It will have a domino effect not only on our petroleum industry but particularity on our jobbers, and on every Man, Woman and Child in this State. First I strongly urge the board to set different compliances or reporting requirements and time tables for small businesses that are liveable and attainable. Secondly, exemptions for small businesses at a cost they can afford. I feel your proposed exemption fees from $ 7,500.00 to $ 26,000.00 is totally unreasonable for a small business.

Let me now give you a little scenario on how I feel the domino effect will start. My bulk plant was built in 1924 and operated by a Major Oil Company to 1971 (47 years). In 1971 after spending 11 years with a Major Oil Company I purchased our plant and became an Independent Oil Jobber. In the thirteen years I have been responsible for the operation, We have taken every operating day a daily inventory control on every underground tank. As of this date, we have never had any major spills or unauthorized releases. However, I can not guarantee what has happened at our plant during the 47 years that the Major Oil Companies were responsible for. In fact it dates back to before I was born. Our plant is located at the end of a street where there were five other Major Oil Bulk Plants all located above us.

If any of the other five Bulk Plants had any unauthorized spills in the

Continue

same 47 years of operation it is possible their hydrocarbons could be under my plant today, and when monitoring wells are installed who is going to be liable for clean up ? According to your proposed guidelines, I am. I am guilty of something I did not do, nor could I have prevented it.

I have seen the cleanup cost levied on one service station in Santa Barbara, last month for over $200,000.00. This cost was just to remove dirt to a hazardous dump site. As of this date the station has not been opened and the final cost I would hate to estimate.

I know my Corporation cannot absorb these kinds of costs even though we have Pollution insurance up to two million dollars. The fine print in the insurance policy states that they will only pay up to 10 per cent for an onsite cleanup with a total insurance overage of only $ 200,000.00.

Ladies and Gentlemen, if our plant cleanup cost for historic spills were in excess of my insurance policy I would have no other alternative other than to declare Corporate bankruptcy.

Now what happens to my 1,500 Agricultural, Commercial and Industrial accounts? Where do they go to now for their Petroleum needs? (hydraulic oils, greases, gear lubes, cleaning solvents, etc...). The Major Oil Companies have already made it clear they do not want to service this class of trade. Since your guidelines were made public, the Majors have also stated that they do not feef they can justify in the State of California service stations doing less than 350,000 gallons per month.

Now what happens to the farmers/home owners who do not have a 8,000 gallon

Continue

or larger tank? Even though you have exempted the small agricultural tanks and fuel oil tanks, they have no supplier to turn to. There only alternative would be to go to the closest service station (some small towns might not even have a station) with their 55 gallon drums or their 5 gallon cans and wait in lines like we did in 1973 and 1978 when the Arab embargo hit our country. In essence, if your proposed guidelines are adopted you have just ruined the finest distributions systems in the world, that has survived two World Wars, Korea, Vietnam and 1973 and 1978 fuel embargo.

For recommendations, my first one is to establish <u>How Clean is Clean</u> and <u>How Dirty is Dirty</u>. There is nothing in your proposed guidelines to guide us or anyone, on how clean we have to get our properties or at what point we have to clean it up. I can see over Zellus Governmental Officals making businesses clean up when there is no need too.

I firmly believe that the State should do a Geological Impact Survey on the whole State finding out where the sensitive Geological areas are and where the real dangers to Health and Welfare to the public are. The State should concentrate on those areas first. I have been told there are some areas you could not hurt if you tried.

Your proposed guidelines, treat all Underground Tanks the same. It makes no sense to me to spend thousands and thousands of dollars in some areas where there is no need to.

This brings up another point, What about all the closed service station sites that have been sold in the past few years where banks, new office building etc... sit today. There is the same potential historic contamination

Continue

there as you will find in an operating station. We are all guilty of hydrocarbon pollution. Anyone who has pumped gasoline into their cars and especialy with vapor recovery nozzles, has spilled gasoline. Over a period of years all this spillage will add up to contaminated soil.

According to your guidelines, this type of historic spillage would not be monitored. This means that your regulations are discriminatory to current petroleum owners and not to other property owners who may also have contaminated soil.

This problem is not only the owner/operated problem, it is everyones problem, and everyone should share in the cost of cleanup and not just the current owner. I do not believe you can go back to the previous owner. He broke no laws when did have an unauthorized spill and if he did, most likely the statue of limitations ha already run out.

Chairman Krushev stated they would bury us Capitalists. Gromeko states he didn't mean that, that Capitalists would bury themselves, and Ladies and Gentlemen, your proposed guidelines on Underground tanks are a typical example of our own bureaucracy burying our free enterprise system.

Thank you,

Bert W. Mc Cormack

Bert W. Mc Cormack
President

McCormix Co.
#94-E

Water Resources Board

The below figures are six (6) loads that were picked up in Los Angeles and San Diego area refineries the week of January 13th, 1985.

All loads were temperature corrected at the refinery, and again checked before the products was dropped in the below ground tanks. Three (3) of the loads were delivered from Los Angeles to Santa Barbara approximately 2½ hours driving time. One (1) load was picked up in Los Angeles and delivered to Lancaster in the desert approximately 1½ hours driving time. The two (2) remaining loads were picked up in San Diego and delivered to Escondido approximately one (1) hour driving time.

The results are as follows;

LOCATION	PRODUCT	TEMPERATURE LOADED	TEMPERATURE LOCATION	GALLON DIFFERENCE
1. Escondido	Diesel	60	59	-3
2. Santa Barbara	Regular	64	68	+8
	Nolead	70	72	+3
3. Santa Barbara	Regular	61	54	-31
4. Santa Barbara	Diesel	58	63	+9
5. Escondido	Nolead	56	60	+20
6. Lancaster	Nolead	59	54	-23

McCormick

UNION OIL COMPANY OF CALIFORNIA

ASTM D-1250 ABRIDGED VOLUME CORRECTION TABLE FOR PETROLEUM OILS

ADOPTED BY THE UNION OIL COMPANY OF CALIFORNIA JANUARY 1, 1954
EXTENSION OF TABLE NO. 7 FROM 0° TO MINUS 30° F

VOLUME AT 60° F OCCUPIED BY UNIT VOLUME AT OBSERVED TEMPERATURE

OBSERVED TEMPERATURE DEG. FAHR.	GROUP 1 15.0° TO 34.9° A.P.I. AT 60°	GROUP 2 35.0° TO 50.9° A.P.I. AT 60°	GROUP 3 51.0° TO 63.9° A.P.I. AT 60°	GROUP 4 64.0° TO 78.9° A.P.I. AT 60°	OBSERVED TEMPERATURE DEG. FAHR.	GROUP 1 15.0° TO 34.9° A.P.I. AT 60°	GROUP 2 35.0° TO 50.9° A.P.I. AT 60°	GROUP 3 51.0° TO 63.9° A.P.I. AT 60°	GROUP 4 64.0° TO 78.9° A.P.I. AT 60°
-30	1.0361	1.0448	1.0542	1.0629	50	1.0040	1.0050	1.0061	1.0070
-29	1.0357	1.0443	1.0536	1.0622	51	1.0036	1.0045	1.0054	1.0063
-28	1.0353	1.0438	1.0530	1.0615	52	1.0032	1.0040	1.0048	1.0056
-27	1.0349	1.0433	1.0524	1.0608	53	1.0028	1.0035	1.0042	1.0049
-26	1.0345	1.0428	1.0518	1.0601	54	1.0024	1.0030	1.0036	1.0042
-25	1.0341	1.0423	1.0512	1.0594	55	1.0020	1.0025	1.0030	1.0035
-24	1.0337	1.0418	1.0506	1.0587	56	1.0016	1.0020	1.0024	1.0028
-23	1.0333	1.0413	1.0500	1.0580	57	1.0012	1.0015	1.0018	1.0021
-22	1.0329	1.0408	1.0494	1.0573	58	1.0008	1.0010	1.0012	1.0014
-21	1.0325	1.0403	1.0488	1.0566	59	1.0004	1.0005	1.0006	1.0007
-20	1.0321	1.0398	1.0482	1.0559	60	1.0000	1.0000	1.0000	1.0000
-19	1.0317	1.0393	1.0476	1.0552	61	.9996	.9995	.9994	.9993
-18	1.0313	1.0388	1.0470	1.0545	62	.9992	.9990	.9988	.9986
-17	1.0309	1.0383	1.0464	1.0538	63	.9988	.9985	.9982	.9979
-16	1.0305	1.0378	1.0458	1.0531	64	.9984	.9980	.9976	.9972
-15	1.0301	1.0373	1.0452	1.0524	65	.9980	.9975	.9970	.9965
-14	1.0297	1.0368	1.0446	1.0517	66	.9976	.9970	.9964	.9958
-13	1.0293	1.0363	1.0440	1.0510	67	.9972	.9965	.9958	.9951
-12	1.0289	1.0358	1.0434	1.0503	68	.9968	.9960	.9951	.9944
-11	1.0285	1.0353	1.0428	1.0496	69	.9964	.9955	.9945	.9936
-10	1.0281	1.0348	1.0422	1.0489	70	.9960	.9950	.9939	.9929
-9	1.0277	1.0343	1.0416	1.0482	71	.9956	.9945	.9933	.9922
-8	1.0273	1.0338	1.0410	1.0475	72	.9952	.9940	.9927	.9915
-7	1.0269	1.0333	1.0404	1.0468	73	.9948	.9935	.9921	.9908
-6	1.0265	1.0328	1.0398	1.0461	74	.9944	.9930	.9915	.9901
-5	1.0261	1.0323	1.0392	1.0454	75	.9940	.9925	.9909	.9894
-4	1.0257	1.0318	1.0386	1.0447	76	.9936	.9920	.9903	.9887
-3	1.0253	1.0313	1.0380	1.0440	77	.9932	.9916	.9897	.9880
-2	1.0249	1.0308	1.0374	1.0433	78	.9929	.9911	.9891	.9873
-1	1.0245	1.0303	1.0368	1.0426	79	.9925	.9906	.9885	.9866
0	1.0241	1.0298	1.0362	1.0419	80	.9921	.9901	.9879	.9859
1	1.0237	1.0293	1.0356	1.0412	81	.9917	.9896	.9873	.9851
2	1.0233	1.0288	1.0350	1.0405	82	.9913	.9891	.9866	.9844
3	1.0229	1.0283	1.0344	1.0399	83	.9909	.9886	.9860	.9837
4	1.0225	1.0276	1.0338	1.0392	84	.9905	.9881	.9854	.9830
5	1.0221	1.0273	1.0332	1.0385	85	.9901	.9876	.9848	.9823
6	1.0217	1.0268	1.0326	1.0378	86	.9897	.9871	.9842	.9816
7	1.0213	1.0263	1.0320	1.0371	87	.9893	.9866	.9836	.9809
8	1.0205	1.0258	1.0314	1.0364	88	.9889	.9861	.9830	.9802
9	1.0205	1.0253	1.0308	1.0357	89	.9885	.9856	.9824	.9795
10	1.0201	1.0248	1.0302	1.0350	90	.9881	.9851	.9818	.9787
11	1.0197	1.0243	1.0296	1.0343	91	.9877	.9846	.9812	.9780
12	1.0193	1.0238	1.0290	1.0336	92	.9873	.9841	.9806	.9773
13	1.0189	1.0233	1.0284	1.0329	93	.9869	.9836	.9799	.9766
14	1.0185	1.0228	1.0278	1.0322	94	.9865	.9831	.9793	.9759
15	1.0181	1.0223	1.0272	1.0315	95	.9861	.9826	.9787	.9752
16	1.0177	1.0219	1.0266	1.0308	96	.9857	.9821	.9781	.9745
17	1.0173	1.0214	1.0260	1.0301	97	.9854	.9816	.9775	.9738
18	1.0168	1.0209	1.0253	1.0294	98	.9850	.9811	.9769	.9731
19	1.0164	1.0204	1.0247	1.0287	99	.9846	.9806	.9763	.9723
20	1.0160	1.0199	1.0241	1.0280	100	.9842	.9801	.9757	.9716
21	1.0156	1.0194	1.0235	1.0273	101	.9838	.9796	.9751	.9709
22	1.0152	1.0189	1.0229	1.0266	102	.9834	.9791	.9745	.9702
23	1.0148	1.0184	1.0223	1.0259	103	.9830	.9786	.9738	.9695
24	1.0144	1.0179	1.0217	1.0253	104	.9826	.9781	.9732	.9688
25	1.0140	1.0174	1.0211	1.0246	105	.9822	.9776	.9726	.9681
26	1.0136	1.0169	1.0205	1.0239	106	.9818	.9771	.9720	.9673
27	1.0132	1.0164	1.0199	1.0232	107	.9814	.9766	.9714	.9666
28	1.0128	1.0159	1.0193	1.0225	108	.9810	.9761	.9708	.9659
29	1.0124	1.0154	1.0187	1.0218	109	.9806	.9756	.9702	.9652
30	1.0120	1.0149	1.0181	1.0211	110	.9803	.9751	.9696	.9645
31	1.0116	1.0144	1.0175	1.0204	111	.9799	.9746	.9690	.9638
32	1.0112	1.0139	1.0169	1.0197	112	.9795	.9741	.9683	.9630
33	1.0108	1.0134	1.0163	1.0190	113	.9791	.9736	.9677	.9623
34	1.0104	1.0129	1.0157	1.0183	114	.9787	.9731	.9671	.9616
35	1.0100	1.0124	1.0151	1.0176	115	.9783	.9726	.9665	.9609
36	1.0096	1.0119	1.0145	1.0169	116	.9779	.9721	.9659	.9602
37	1.0092	1.0114	1.0139	1.0162	117	.9775	.9717	.9653	.9595
38	1.0088	1.0109	1.0133	1.0155	118	.9771	.9712	.9647	.9587
39	1.0084	1.0104	1.0127	1.0148	119	.9767	.9707	.9641	.9580
40	1.0080	1.0099	1.0121	1.0141	120	.9763	.9702	.9634	.9573
41	1.0076	1.0094	1.0115	1.0134	121	.9760	.9697	.9628	.9566
42	1.0072	1.0089	1.0109	1.0127	122	.9756	.9692	.9622	.9559
43	1.0068	1.0084	1.0103	1.0120	123	.9752	.9687	.9616	.9552
44	1.0064	1.0079	1.0097	1.0113	124	.9748	.9682	.9610	.9544
45	1.0060	1.0075	1.0091	1.0106	125	.9744	.9677	.9604	.9537
46	1.0056	1.0070	1.0085	1.0099	126	.9740	.9672	.9598	.9530
47	1.0052	1.0065	1.0079	1.0091	127	.9736	.9667	.9592	.9523
48	1.0048	1.0060	1.0073	1.0084	128	.9732	.9662	.9585	.9516
49	1.0044	1.0055	1.0067	1.0077	129	.9728	.9657	.9579	.9508

#95

AVANTI MANAGEMENT, INC.

920 South Robertson Blvd., Suite 4 • Los Angeles, California 90035 • (213) 657-1034

GOOD DAY, LADIES AND GENTLEMEN, MY NAME IS DR. J. W. COLIN, I AM AN INDEPENDENT MARKETER OF PETROLEUM PRODUCTS IN THE L. A. BASIN. I OWN AND OPERATE TEN SERVICE STATIONS AND TWELVE CAR WASHES. MY BACKGROUND IS IN ECONOMICS/FINANCE AND I ALSO AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS.

TODAY, I WOULD LIKE TO ADDRESS CERTAIN OF THE PROBLEMS ASSOCIATED WITH THE PROPOSED IMPLEMENTATION OF THE SHER BILL (A. B. 1362) AS I SEE IT AS AN INDEPENDENT MARKETER OF PETROLEUM PRODUCTS.

I AM ONE OF MANY INDEPENDENT OPERATORS, OWNERS AND DISTRIBUTORS IN THE STATE AND MY PROBLEMS SHOULD BE TYPICAL OF THOSE ENCOUNTERED BY OTHERS. FIRST, LET ME ASSURE YOU THAT INDEPENDENTS SUCH AS MYSELF BREATHE THE SAME AIR, EAT THE SAME FOODS AND LIVE IN THE SAME ENVIRONMENT AS EVERYONE ELSE IN THIS ROOM - I HAVE NO DESIRE TO SEE THE ATMOSPHERE, EARTH OR ITS ENVIRONS POLLUTED ANYMORE THAN ANY OF YOU. FURTHER, AS A MEMBER OF THE PRIVATE SECTOR (WHOSE AIMS I AM ALWAYS REMINDED IS TO MAKE A PROFIT)--I HAVE NO INTEREST WHATSOEVER, IN SPILLING PRODUCTS WHICH COST UPWARDS TO A DOLLAR A GALLON ONTO THE EARTH. SUCH ACTIONS ARE UNPRODUCTIVE, UNPROFITABLE AND UNNECESSARY. THE SOURCES OF THE FIGURES I WILL BE USING TODAY COME FROM:

A. 1984 ANNUAL REPORTS OF THE 7 MAJOR OIL COMPANIES

B. CURRENT STANDARD AND POORS SHEETS ON THE 7 MAJOR OIL COMPANIES

C. INTERVIEWS WITH MAJOR OIL CO. ENGINEERS

D. THE LUNDBERG SURVEYS 1984

E. NATIONAL PETROLEUM NEWS MAGAZINE - 1984

F. TAXABLE SALES IN CALIFORNIA 1984 FIRST QUARTER 1984 - STATE BOARD OF EQUALIZATION

THE INDEPENDENT SECTOR OF THE MARKET IN CALIFORNIA RETAILS APPROXIMATELY 20% OF THE TOTAL TAXABLE SALES OF PRODUCTS AS INDEPENDENT BRANDS. ADDITIONALLY, MANY INDEPENDENTS MARKET UNDER MAJOR COMPANY FLAGS. SINCE INDEPENDENTS OWN IN EXCESS OF 35% OF THE RETAIL OUTLETS IN THE STATE. I WOULD ASSUME THAT TOTALLY, INDEPENDENTS RETAIL APPROXIMATELY 35% OF THE TOTAL TAXABLE SALES OF GASOLINE IN THE STATE I.E. 20% THROUGH INDEPENDENT BRANDS AND 15% THROUGH MAJOR BRANDS. AS A WHOLE, THE INDEPENDENTS ARE THE MOST COST EFFECTIVE AND EFFICIENT DELIVERER OF PRODUCTS TO THE CONSUMER. I WOULD SUGGEST THAT ONE ONLY LOOK AT THE STREET SIGN POSTING OF SUCH COMPANIES AS WICKLAND, REGAL, WORLD, THRIFTY, U. S. A., BEACON, KWIK AND WINALL TO NAME A FEW TO VERIFY WHO FORMS THE BOTTOM OF THE PRICE MARKET. FURTHER, ONE ONLY HAS TO LOOK AT THE "DISCOUNT" MAJOR STATION, WHICH AGAIN IN LARGE PART, ARE OWNED AND OPERATED BY INDEPENDENTS OR INDEPENDENT CHAIN OPERATORS TO SEE WHO DELIVERS MAJOR PRODUCTS AT THE LOWEST PRICES. WERE THE INDEPENDENT SEGMENT OF THE MARKET ELIMINATED, IMPAIRED OR DESTROYED THE "BOTTOM" OF THE MARKET WOULD BE REPLACED BY A HIGHER LEVEL BOTTOM. CURRENTLY, THERE IS ANYWHERE FROM 1 to 7¢ PRICE DIFFERENTIAL BETWEEN THE INDE-

PENDENTLY CONTROLLED OUTLETS AND MAJOR OWNED AND OPERATED OR MAJOR DEALER OPERATED ESTABLISHMENTS. WITHOUT US AS "MARKET MAKERS" THERE WOULD BE NO INCENTIVE TO COMBAT LOW PRICES - AS THERE WOULD BE NO ONE TO OFFER THEM! I WILL REMIND YOU THAT THE CONSUMER USES BETWEEN 900 MILLION AND 1 BILLION GALLONS OF PRODUCTS EACH AND EVERY MONTH. THEREFORE EVERY 1¢ INCREASE AT THE PUMP REPRESENTS $9 MILLION + / MONTH COST TO THE CONSUMERS. I WOULD HOPE NO ONE WOULD BELIEVE THAT THE COSTS ASSOCIATED WITH UNDERGROUND CONTROL WILL NOT BE PASSED ALONG TO THE PUBLIC IN THE FORM OF HIGHER PUMP PRICES IN ONE FASHION OR ANOTHER. *I BELIEVE THAT THERE IS A NECESSARY BALANCE BETWEEN WHAT IS BEING* CONSIDERED AND WHAT IS NECESSARY AND PRACTICAL TO PROTECT THE PUBLIC FROM PAYING DEARLY. I WOULD SUGGEST THAT A 5¢ PER GALLON PRICE INCREASE AT THE PUMP LEVEL WOULD BE ENTIRELY POSSIBLE IF THE INDEPENDENT SEGMENT AND ITS EFFICIENCIES OF DELIVERY WERE ELIMINATED. THIS WOULD COST THE PUBLIC UPWARDS TO $45 MILLION PER MONTH. I ASK YOU, IF THE PUBLIC WERE AWARE OF THAT SORT OF COST - WOULD THEY NOT BE ALARMED AND WANT TO LOOK AT ALTERNATIVE METHODS OF UNDERGROUND TANK CONTROL?

WITH THE ABOVE AS A BACKGROUND, I NOW WOULD LIKE TO DISCUSS THE FINANICAL IMPACT OF THE PROPOSED IMPLEMENTATION REGULATIONS ON SMALL INDEPENDENT FIRMS SUCH AS MYSELF. I WOULD SUGGEST THAT I WOULD BE REPRESENTATIVE OF MANY SMALL FIRMS WITH MAYBE ONE EXCEPTION, WE HAVE ONLY BEEN IN BUSINESS SINCE ONLY 1940 - WHILE SEVERAL OF THE OTHER FIRMS I MENTIONED EARLIER GO BACK 2 OR MAYBE 3 GENERATIONS. AS CURRENTLY PROPOSED, I AM TOLD BY MAJOR COMPANY ENGINEERS AND EXPERTS THAT I SHOULD LOOK TO COSTS IN THE ORDER OF MAGNITUDE OF UPWARDS OF $1 MILLION TO REPAIR AND OR REPLACE MY UNDERGROUND TANKS TO COMPLY

WITH THE "HISTORIC" SECTION OF THE CODE $1 MILLION MAY NOT SOUND LIKE MUCH. HOWEVER, IT REPRESENTS IN EXCESS OF 30% OF OUR NET WORTH. A FIGURE OF THAT MAGNITUDE WILL UPSET OUR FINANCIAL RATIOS UPON WHICH WE BASE OUR D & B RATINGS AND LETTERS OF CREDIT WHICH ARE USED TO FACILITATE PRODUCT PURCHASES FROM OUR SUPPLIERS. WE ARE A SOUNDLY MANAGED, CONSERVATIVELY STRUCTURED, OPERATION WHOSE LONG TERM DEBT (CURRENTLY) IS NIL - AND IF OUR ABILITY TO OBTAIN NECESSARY LETTERS OF CREDIT WOULD BE IMPAIRED - I HATE TO THINK WHAT WILL HAPPEN TO LESS CONSERVATIVELY (OR MORE NORMALLY FINANCED FIRMS). I BELIEVE THEY WILL BE EFFECTIVELY BLOCKED FROM THE CREDIT MARKETS BY THE POTENTIAL FINANCIAL DEMANDS OF THESE PROPOSED REGULATION. IF THE COSTS ARE SO HIGH, WHY HAVE THE MAJOR CORPORATIONS NOT BEEN HEARD FROM AS A LOUD VOCAL VOICE AGAINST THESE PROPOSED REGULATIONS? I WILL ILLUSTRATE WHY I BELIEVE THEY ARE LARGELY QUIET. IT GOES BEYOND "BEING FOR APPLE PIE AND MOTHERHOOD". IT IS A SIMPLE FACT THAT COST LEVELS OF 100'S OF MILLIONS OF DOLLARS ARE EVERYDAY EXPERIENCES TO THE MAJORS. IN 1983, ARCO, SHELL AND CHEVRON EACH SPENT OVER $100 MILLION IN THE CALIFORNIA MARKET TO IMPROVE THEIR RETAIL MARKETING OR REFINING OPERATIONS. EXXON NATION-WIDE HAS SPENT OVER $100 MILLION ON TANK RENOVATIONS. THESE FIGURES EACH EXCEED MY NET WORTH BY 75 - 80 TIMES!

I WOULD EXPECT THE MAJORS TO SPEND: IN CALIFORNIA

14124 STATIONS - 5500 INDY STATIONS = 8624 STATIONS

TIMES $100,000/STATION OR $862,400,000 COLLECTIVELY TO COMPLY WITH THIS PROPOSAL. NOW LET US GO BACK TO MY EARLIER STATEMENT THAT FOR EACH 1¢/GALLON RISE AT THE PUMP (OR WHOLESALE INCREASE PASSED ON) IT WILL COST THE PUBLIC $9 MILLION PER MONTH OR $108 MILLION PER YEAR. THEREFORE, FROM THE MAJOR COMPANY VIEWPOINT THEIR SILENCE IS MERELY AN

ECONOMIC QUIET AS A:

1¢/GALLON INCREASE RETURNS THEIR MONEY IN 8 YEARS

2¢/GALLON INCREASE RETURNS THEIR MONEY IN 4 YEARS

3¢/GALLON INCREASE RETURNS THEIR MONEY IN 2.6 YEARS

4¢/GALLON INCREASE RETURNS THEIR MONEY IN 2- YEARS

WHILE AT THE SAME TIME, I CANNOT YIELD ANY ECONOMIC RETURNS ON MY INVESTMENT. WHY IS THIS SO? IT IS TRUE BECAUSE I AM NOT A REFINER. I AND THE REST OF THE INDEPENDENTS BUY THE PRODUCTS FROM REFINERIES AND INCREASES IN COST AT THE WHOLESALE LEVEL YIELD NO ECONOMIC RETURN. I ONLY YIELD AN ECONOMIC RETURN WHEN I SELL PRODUCTS AT AN INCREASED MARGIN NOT AT AN INCREASED COST. LET ME STILL THE OBVIOUS QUESTION ON YOUR MINDS - I CAN NOT ARBITRARILY INCREASE MY MARGIN AT MY WHIM. TYPICALLY, FOR EVERY 1¢ YOU RAISE YOUR PRODUCT MARGIN AT THE STREET LEVEL ABOVE YOUR COMPETITION YOU WILL LOSE 10-15% OF THROUGH PUT VOLUME AND YOU WILL BE WORSE OFF THAN BEFORE AND SLOWLY DIE ON THE VINE - SO TO SPEAK. I THEREFORE SUGGEST TO YOU THAT THE REAL REASON WHY YOU ARE ONLY PRIMARILY HEARING FROM INDEPENDENTS TODAY IS THAT THE LARGE COMPANIES SEE THIS AS A WAY TO LEGISLATIVELY GAIN CONTROL OF THE MARKET, WHILE AT THE SAME TIME YIELDING AN ECONOMIC RETURN, I. E. INCREASES AT THE DEALER TANK WAGON (DTW) LEVEL WHICH WILL RECOUP THEIR INVESTMENT.

LEAVING WHY THE REGULATIONS WILL DESTROY INDEPENDENTS SUCH AS MYSELF IF IMPLEMENTED IN THE PROPOSED FASHION, I WILL SUGGEST SOME WAYS IN WHICH THE INDEPENDENTS AND THE PUBLIC CAN BE INSULATED FROM THE FINANCIAL SHOCK WHILE STILL ACHIEVING THE MAJOR EMPHASIS OR GOAL OF A CLEANER ENVIRONMENT.

PROPOSED SOLUTION

1. DETERMINE WHERE THE UNDERGROUND ACQUIFERS ARE IN THE STATE (BY SOME FORM OF E. I. R. TYPE STUDY).
2. DETERMINE WHICH (IF ANY) PETROLEUM FACILITIES ARE IMPINGING ON THE ACQUIFERS AND CLEAN THEM UP FIRST.
3. FOR REMAINING FACILITIES WHERE THE HISTORIC PORTION IS DORMANT DO NOTHING UNTIL:
   A. A FUTURE LEAK OCCURS THEN CLEAN THE WHOLE SITE
   B. THE PROPERTY CHANGES USES - I. E. A NEW LAND USE - THEN CLEAN THE WHOLE SITE
4. IN ANY EVENT, PLACE A MORATORIUM DATE WHEN HISTORIC CLEAN UP MUST TAKE PLACE I. E. THE YEAR 2000 or 2010 ETC.

I BELIEVE THESE MODIFICATION WILL ALLOW:

A. INDUSTRY TO WORK WITH TECHNOLOGY TO AFFECT "IN PLACE" EARTH CLEANING PROCEDURES OR SOME OTHER "HIGH TECH" SOLUTION TO THE PROBLEM

B. ENABLE SMALL OPERATORS TO ADSORB THE FINANCIAL IMPACT OVER AN EXTENDED PERIOD OF TIME

AND

C. ALLOW THE REAL ESTATE MARKET TO EVALUATE AND BALANCE OUT THE DEFLATIONARY IMPACT OF LARGE POTENTIAL CONTINGENT LIABILITIES ON FUTURE PURCHASERS OF PROPERTY IN THE STATE.

D. GIVE PROPERTY TAX RELIEF TO PROPERTY OWNERS WHOSE SITE VALUES ARE REDUCED BY LARGE OVERHANGING CONTINGENT LIABILITIES FOR POSSIBLE OR PROBABLE HISTORIC CONTAMINATION

AND

E. DO NOT INCREASE THE PROPERTY TAX BASE FOR A SITE JUST BECAUSE $100,000 WAS SPENT FOR "ON SITE IMPROVEMENTS" WHICH ARE REALLY NOT "IMPROVEMENTS" IN THE TRADITIONAL SENSE - AS THE NET VALUATION OF THE PROPERTY WILL NOT HAVE INCREASED OVER ITS HISTORIC VALUE - ALL ONE WILL HAVE DONE IS STABILIZE ITS MARKET VALUE AND ELIMINATED THE OVERHANGING CONTINGENT LIABILITIES WHICH SERVED TO REDUCE THE MARKET VALUE IN THE FIRST PLACE

IN CONCLUSION I WOULD LIKE TO CLOSE WITH A FEW THOUGHTS WHOSE IMPLICATIONS I FIND CURIOUS. THE FIRST CONCEPT IS THE IDEA THAT IF EACH OF THE MORE THAN 200,000 UNDERGROUND TANKS REGISTERED IN THE STATE HAVE TO DIG UP - THE RESULTANT PILE OF EARTH WOULD BE THE SIZE OF SEVERAL EMPIRE STATE BUILDINGS! I NOT ONLY WONDER WHERE ONE WOULD PUT ALL THE CONTAMINATED DIRT BUT MORE IMPORTANTLY - IF IT IS AS DANGEROUS AS MS. CHERI EIR OF THE SANTA BARBARA COUNTY HEALTH CARE SERVICES INDICATES (I.E. SHE APPEARED ON THE SITE OF A UNION OIL COMPANY SERVICE STATION LEAK WITH A SPACE SUIT WHICH CONTAINED A SELF CONTAINED BREATHING SYSTEM AS QUOTE - "THIS IS TOO TOXIC TO BREATHE!") I WONDER WHY ONE WOULD DIG ALL THIS DIRT UP IN THE FIRST PLACE AND EXPOSE THE UNSUSPECTING PUBLIC TO SUCH DANGERS? SECONDLY I WOULD LIKE TO POINT OUT THAT EVERYTIME:

A. CAL-TRANS BUYS 9000 GALLONS OF DIESEL FUEL TO SPRAY THE WEEDS ALONG FREEWAYS IN SANTA BARBARA COUNTY

OR

B. A FARMER BUYS 9000 GALLONS OF WEED OIL WHICH IS A PETROLEUM BASED PRODUCT AND SPRAYS IT ON THE GROUND

OR

C. A COUNTY OR STATE AGENCY SPRAYS 9000 GALLONS OF ROAD OIL ON THE SURFACE OF THE EARTH

EACH OF THESE ABOVE ACTIONS WILL CAUSE MORE PETROLEUM PRODUCTS TO BE SPREAD ON THE SURFACE OR THE IMMEDIATE SUB SURFACE OF THE EARTH THAN I SPILLED LAST YEAR SELLING OVER 13,000,000 GALLONS OF PETROLEUM PRODUCTS TO THE PUBLIC!

AVANTI MANAGEMENT, INC.

THESE THOUGHTS AND THE OTHERS I EXPRESSED TO YOU EARLIER IN THIS PRESENTATION LEAD ME TO THE CONCLUSION THAT THERE ARE PRACTICAL WAYS TO SOLVE THESE PROBLEMS WITHOUT MASSIVE UNNECESSARY EXPENDITURES OF FUNDS BY THE PUBLIC AND PRIVATE SECTOR - IF WE WORK TOGETHER.

THANK YOU FOR YOUR TIME.

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Dr. C. Hugh Thompson, P.E.
Director of Environmental Operations
916/355-4265

AEROJET GENERAL GENERAL TIRE
A Subsidiary of The General Tire & Rubber Company
Post Office Box 13618, Sacramento, California 95853

23 October 1984

State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95801

Attention: Harold Singer
Division of Technical Services

Dear Mr. Singer:

Aerojet General Corporation, Sacramento Environmental Operations has reviewed the proposed regulations governing underground storage of hazardous substances, to be codified in Subchapter 16 of Chapter 3, Title 23, California Administrative Code (23 CAC Section 2610-2704). Aerojet is concerned that the regulations are overly prescriptive. The regulations contain specific design, construction, monitoring and operating requirements, where performance standards would be a more appropriate method of ensuring protection of the public health and environment. The specific concerns of Aerojet General have been addressed in detail in the comments submitted by the California Manufacturers Association. Rather than repeating those comments here, Aerojet General would like to indicate our full support for the comments of the California Manufacturers Association.

Sincerely,

C. Hugh Thompson

AEROJET GENERAL
SACRAMENTO ENVIRONMENTAL
OPERATIONS

Pat Thomas
Environmental Analyst
(916) 355-3029

POST OFFICE BOX 15699C DEPT. 9020 SACRAMENTO, CA 95813

SEO/2-16.31

#97D

CICC

CHEMICAL INDUSTRY COUNCIL OF CALIFORNIA

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(916) 442-1420

Mailing Address:
P.O. Box 2567
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Executive Director:
Richard L. Davis

November 26, 1984

Harold Singer
State Water Resources Control Board
Division of Technical Services
P. O. Box 100
Sacramento, CA 95801-0100

Dear Mr. Singer:

Attached are the comments of the Chemical Industry Council of California on the proposed Underground Tank Regulations (draft of November 9, 1984). We respectfully request that these be brought to the attention of the Board prior to any action on these proposed regulations. We would greatly appreciate the opportunity to make a brief verbal statement to the Board to emphasize our concern.

May we extend our commendation to the staff for the monumental task of revising the regulations in the brief period between November 2 and November 9, 1984.

Thank you for your consideration of our concerns.

Cordially,

Richard L. Davis

Richard L. Davis
Executive Director

RLD:cw

Attachment

COMMENTS OF
THE CHEMICAL INDUSTRY COUNCIL OF CALIFORNIA

RELATIVE TO

CALIFORNIA ADMINISTRATIVE CODE TITLE 23 WATERS
CHAPTER 3 WATER RESOURCES CONTROL BOARD
SUBCHAPTER 16 UNDERGROUND TANK REGULATIONS

The Chemical Industry Council of California is pleased to present the following comments on the above referenced regulations proposed under date of November 9, 1984. We hasten to commend Board staff for the monumental effort put forth between November 2 and November 9 in making the revisions. We fully appreciate the magnitude of this effort.

The extent of the revisions, while salutary from our view point, present further problems. It is simply not possible to assess in detail the likely implications of all requirements in the short time allowed for review. Due to the broad applicability of the proposed regulations, there is a real danger of regulatory misadventure if their effects are not fully understood by all parties concerned. We believe it is not possible that either the State Board or the regulated community understand the long range implications of the proposed regulations at this time.

For this reason, CICC urges that the Board **not** adopted the proposed regulations at its November 27th meeting, irrespective of the statutory deadline imposed. There is no technical or scientific justification for such haste in this matter and the probability of real damage to the public welfare by hasty action is high.

In the brief time allowed for study of the proposed regulations, our technical task force has identified a few specific changes which should be made before the regulations are adopted.

1. We believe the intent of AB1362 is very specific in requiring that the SWRCB adopted regulations which allows maximum flexibility for local agencies to develop appropriate underground tank control programs.

   It was our impression that the Board so instructed staff at the November 2 workshop. However, while the revised draft regulations have moved in this direction, the limited monitoring alternatives and the heavy reliance on variance procedures (with their inherent high cost and delays) rather than exclusionary authority, severly limits local authority flexibility.

We urge revision of the regulations to provide maximum flexibility for local authorities to adopt provisions appropriate to their specific localities and circumstances.

2. Article 2. Definition of Terms; §2621 Additional Definitions. With the proposed change in the definition of "motor vehicle fuel tank", the definition of "motor vehicle" should be deleted, or changed to include "any motor fueled by a product intended to be used primarily to fuel motor vehicles".

3. Article 4. Existing Underground Storage Tank Monitoring Criteria; §2640. Applicability. Compliance with this section of the proposed regulations by major chemical facilities is impossible to achieve by any reasonable effort. Compliance by July 1, 1985 will require:

   - Final adoption and OAL clearance of the regulations by January 1, 1985.

   - Evaluation of the State requirements by local agencies and adoption of final regulations.

   - Evaluation by tank owners of monitoring alternatives , development of proposed monitoring plans, and submission to local agencies for approval.

   - Evaluation of proposed plans by local agencies, and approval or rejection (which would require new plans) of the proposed plans.

   - When approved, the owner then must design the monitoring system, purchase and receive the equipment, install it, test the system, establish personnel training, and develop and implement a record-keeping system.

   In the case of a major tank installation, six months is inadequate to accomplish all of these tasks.

   CICC urges the Board to extend the interim monitoring provisions contained in subsection 2641(c)(8)(A) to all tank owners/operators for some period of time, if not the full three years. Without such a provision, an unreasonable burden will be placed on the regulated community with no assurance that adequate systems will be installed

4. §2640(f) - Change the period to a comma, and insert "or where adequate evidence has been provided to show that local site hydrogeological conditions allow adequate protection with less frequent monitoring."

In addition to the above listed specific changes, the CICC task force has other concerns, the effects of which are hard to assess without more time.

CICC urges the Board to delay adoption of the proposed regulations for at least 45 days to allow adequate evaluation of their long range impact. We further urge the Board to immediately seek the concurrence of Assemblyman Sher so that emergency legislative relief can be provided.

To require compliance by July 1, 1985 will result in a less than desirable result, massive non-compliance or both. A delay of six months in the implementation of regulations with such far reaching implications will not endanger public health and will better assure that the public welfare is protected.

We respectfully request your serious consideration of our concerns.

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CICC

CHEMICAL INDUSTRY COUNCIL OF CALIFORNIA

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Executive Director:
Richard L. Davis

October 23, 1984

State Water Resources Control Board
P.O. Box 100
Sacramento, California 95801-0100

Attn: Mr. Harold Singer
Division of Technical Services

Greetings:

Enclosed please find the comments of the Chemical Industry Council of California (CICC) on Regulations Governing Underground Storage of Hazardous Substances, To Be Codified In Subchapter 16 Of Chapter 3, Title 23, California Administrative Code (23 CAC Section 2610-2704), proposed by the State Water Resources Control Board (SWRCB or Board) under date of August 23, 1984.

Chemical Industry Council of California:

The Chemical Industry Council of California is an association of more than 60 large and small California companies engaged in the commerce of chemicals. The technical work of the Council is conducted by practitioners of environmental and health management drawn from member companies. They are highly knowledgeable in the subject of the regulations under consideration today.

Members of CICC strongly support comprehensive environmental management, and the regulations necessary to safeguard the environment and public health. In particular, CICC member companies recognize the need to take all necessary actions to safeguard the drinking waters of the state.

Because chemicals (both man-made and natural) are ubiquitous in our society, regulations controlling their use and disposition have far-reaching and long-range effects on the welfare of our populace. The opportunity for regulatory misadventure is great. For this reason it is essential that regulatory action be based on the best scientific knowledge available and that the cost consequences of that action be examined in relationship to the effectiveness of the requirements.

In our view, the proposed regulations do not represent a balanced approach to achievement of the intent of AB1362 as stated in Section 1(b):

"...to establish a continuing program for the purpose of preventing contamination from, and improper storage of, hazardous substances stored underground."

This sub-section continues by stating,

"It is the intent of the legislature, in enacting this act, to establish <u>orderly</u> procedures that will ensure ...that existing tanks be properly maintained, inspected, and tested ..."(Emphasis added)

In several instances, the proposed regulations move beyond the stated intent of the legislature and apply a panoply of generic solutions encompassing (in some instances) untried technology for application to virtually all underground tanks. The justification provided by the SWRCB for this approach is speculative in nature and unsupported by fact.

Our comments are presented in two sections; (1) **General Comments** and (2) **Specific Comments.**

<u>General Comments:</u>

Our **General Comments** are generic to the regulatory approach employed by the SWRCB. Sections which require changes are identified under **Specific Comments.**

1. CICC strongly supports the thrust of the proposed regulations which provide for self determination of tank and site conditions by the operator. It is most appropriate that the operator is responsible to make the required determinations without unduly burdensome reporting requirements, with that determination subject to regular inspection by the local agency. We strongly urge that this approach be maintained by the SWRCB.

2. In its public notice of these hearings, the SWRCB correctly identified the purpose of the proposed regulations to "...establish the standards and procedures for counties and/or cities to develop and implement permit programs for underground storage tanks storing hazardous substances." §25284.1 of the Health and Safety Code provides that tanks installed prior to January 1, 1984 be outfitted only with (1) a monitoring system capable of detecting unauthorized releases and, (2) <u>where practicable</u>, a means for a visual inspection. It then continues with a series of alternative monitoring methods which the local agency <u>may</u> employ in complying with these two requirements.

   The proposed regulations, however, prescribe mandatory, redundant techniques which must <u>all</u> be required by the local agency, leaving it very little discretionary authority.

   The result of such an approach will be the requirement for unnecessary redundant monitoring methods at many tank sites and, in effect, the preemption of local agency flexibility intended by the authorizing legislation. That regulatory approach exceeds both the intent and the authority of AB1362.

3. The provisions of the Sher bill are consistently phrased in the present and future tenses when addressing leaks or releases. At no point does it address historic or past occurrences.

The proposed regulations, however, prescribe mandatory investigation of historic releases and do so in manner which will make no meaningful contribution to the purpose of the authorizing legislation. Requirements of the proposed regulations far exceed the stated need to simply ensure the effectiveness of monitoring methods developed to comply with the regulations. In this regard, the proposed regulations materially exceed the SWRCB's statutory authority.

4. The proposed regulations include no provisions for operating underground storage tanks between the effective date of the regulations (July 1985) and the date an actual permit is issued. Neither do they provide an implementation time frame for compliance with investigation and monitoring procedures after a permit is issued.

Given the excessive technological requirements of the regulations, and the level of availability of qualified professional personnel and equipment, considerable time will be required to implement the procedures mandated by the proposed regulations irrespective of the operator's commitment to rapid compliance.

Some form of "interim status" provisions and guidelines for implementation timing are required.

Specific Comments:

1. Article 1. General

- §2611(a)(1): References to Articles 3 and 4 of this subchapter should be deleted. Provisions of these articles are not comparable to the provisions of HSC Sections 25284 and 25284.1.

2. Article 2. Definitions: §2620:

- Motor Vehicle: If it is necessary to retain this definition, it should be changed to describe any motorized vehicle. The current definition does not include a large number of off-highway motorized vehicles currently in use by industry and agriculture. There is no logical justification for this restrictive definition.

- Motor Vehicle Fuel: It was the intent of the Sher bill to regulate tanks containing specified substances, not vehicles. there can be no logical justification for making a distinction (for instance) between tanks containing diesel fuel for use in a truck and those containing diesel fuel for use in a generator. The words, "which is intended to be used" should be changed to "which is designed for use".

- Pipe: This definition should be changed to specifically excludes pipes which do not normally contain liquids.

- Product Tight: Tank design technology accommodates a degree of physical or chemical deterioration over the life of the tank. Virtually every substance is "subject" to such deterioration. We suggest this definition be changed to include, "Subject to physical or chemical deterioration by the substance which it contains which would, over the useful life of the tank, cause any portion of the tank to fail to satisfy minimum design criteria". We believe this is consistent with the intent of the author.

- Underground Storage Tank: The phrase, "...including pipes connected thereto..." should be changed to, "...including pipes which cannot be hydraulically isolated from the tank...". Without this clarification, essentially every pipeline in (and out) of a facility would be included simply by being, in some fashion, remotely connected. This is clearly not the intent of the author.

3. Article 3. New Tank Construction and Monitoring Standards:

   - §2631(e): The 24-hour, 100-year storm provision should be changed to a 24-hour, 25-year storm in accordance with 1984 legislative direction.

   - §2632(e): The requirement for **continuous** monitoring is excessive and unnecessary. Continuous monitoring technology is unproven and exceedingly expensive. This provision should be deleted.

   - §2633(b): As proposed, the provisions of this section allows for no new materials technology. Irrespective of the AB1362 language, it is unlikely that the author intended to prohibit the use of new materials if they are superior to existing materials. SWRCB is urged to request clarification from the author.

   - §2634(b): Needs clarification regarding the number of monitoring locations requiring access casings with sensors. Secondary containment should be constructed with sump and use one sensor.

- §2634(c): In addition to inventory control for motor vehicle fuel tanks, secondary containment and continuous-sensor monitoring are also required. Continuous-sensor monitoring is an unproved technology and extremely expensive. This should not be necessary if inventory control is being practiced.

4. <u>Article 4. Existing Underground Storage Tank Monitoring Criteria</u>

   - §2640(a): In line 6 of this subsection, delete "and historic". Same line, after "unauthorized release" add "and". On line 7, put a period after "future" and delete "and be capable of measuring the ground water quality directly". Requirements for providing historic data and ground water quality determination are not authorized in statute.

   - §2640(b): On line 3 of the subsection, delete "or have occurred in the past". Add appropriate "and". On line 5, delete "and to directly measure the quality of the ground water underlying the tank". See comment above.

   - §2640(c): Delete entire subsection since AB1362 does not authorize this requirement.

   - §2640(e) In line 3 of the subsection, delete "each". AB1362 makes provisions for alternative monitoring methods and does not require <u>all</u> methods.

   - §2640(g): Delete entire subsection. See comments at §2647.

   - §2641(c)(4): The wording of this subsection suggests that the reporting of information to some agency is required. Since the intent is that the operator maintain a record of the information it is suggested that the words, "and reporting" be deleted to make the intent clear.

   - §2642(c): Underground storage tank testing methods must make adjustments for vapor pockets, thermal expansion/contraction, temperature stratification, etc. The size of these adjustments should be specified or a reference given.

   - §2643: It appears that this entire section is intended to apply only to tanks associated with retail sales. Language should make clear that other tanks are exempted.

   - §2644(a): This subsection should be deleted since its stated purpose is to determine if prior releases have occurred. (See General Comment #3 for justification.)

- §2644(c): We see no justification for the <u>universal</u> requirement for slant borings. In general, they are expensive and undesirable for a number of reasons:

  1. Slant drilling rigs are not readily available.

  2. It is difficult to drill a straight slant-hole.

  3. Borings have a tendency to collapse.

  In situations where slant borings might be required, they should be specified only where the depth of the ground water is greater than 50 feet. No useful information will be obtained when ground water is at a shallower level.

- §2644(e)(2): The approved EPA method mentioned in this subsection should be specified.

- §2644(e)(3)(B)(ii): Delete entire subsection.(See General Comment #3 for justification).

- §2644(e)(3)(C): This subsection should be rewritten to remove requirements related to historical changes. (See General Comment #3 for justification).

- §2644(e)(4): In line 2 of subsection, delete "by" and insert "under the direction of". A registered or certified professional engineer is responsible for the accuracy of the data collected under his/her direction. More competence in logging will be obtained under this wording.

- §2645: Vadose zone monitoring should be provided as an <u>alternative</u> monitoring technique, rather than required unless specifically exempted. Vadose zone monitoring has not been proven under all conditions applicable in these regulations.

- §2645(f)(1): An on-site demonstration that vapor would be detected by the vadose zone detection monitoring system is an excessive requirement. Literature regarding the monitoring system should provide sufficient information regarding system performance.

- §2645(h): Continuous monitoring technology is excessively expensive and is not sufficiently reliable to be included as a general requirement. The requirement for weekly monitoring is unjustified. Monthly would be more than adequate and quarterly will provide the necessary protection.

- §2646(b), (c) and (d): These subsections as written are very confusing. We recommend they be rewitten to provide the following requirements;

(a) Both vadose zone and ground water monitoring should be used if ground water is encountered between 5 and 30 feet from the tank invert.

(b) Only vadose zone monitoring should be required if ground water is greater than 30 feet below tank invert.

(c) Ground water monitoring should be the principle leak detection technique if ground water is within 5 feet of the tank invert.

- §2646(e)(1): The language in this subsection should be substantially simplified. References to "arcs" and "radii of influence" (incorrectly used as presently written) should be deleted.

  The subsection should provide the following requirements;

  (a) Use of three ground water monitoring wells per tank is excessive. One well per 30 feet of tank is adequate.

  (b) Wells should be downgradient of tank and should not be directly beneath tank because of the nature of contaminant movement in soil and ground water.

  (c) All wells should be located as close as possible to the underground storage tank or the perimeter of the facility.

  Those provisions will be adequate to accomplish the purpose of this subsection and will be understandable by the regulated community.

- §2646(e)(3): Minimum 4-inch-diameter well casing is excessive. Two-inch casing is sufficient. Requirement should be changed accordingly.

- §2646(f): Considering typical rates of ground water migration and the rate of migration of a contaminant from a leak, weekly sampling is excessive. Monthly sampling would be sufficient.

- §2647: CICC requests deletion of this entire section. We disagree with the SWRCB contention presented in the Factual Basis section of the August 23rd Statement of Reasons. While one of the goals of AB1362 may be as stated in that section, we do not agree it was the author's intent that owners/operators of underground tanks be required to establish a state-wide ground water quality monitoring program. In fact, other statutes place that responsibility on suppliers of water. Such a requirement for owners/operators of underground tanks is a duplication of effort and imposes an unreasonable burden on a single segment of our society.

In any event, adequate ground water monitoring is required as a leak detection method in §2466 to accomplish the stated purpose of §2467. Under any circumstances, Assurance Ground Water Monitoring would be justified in only a small percentage of underground tank installations. The resources required to institute such a system are material. To impose this economic burden on society unnecessarily will be counter-productive.

If Assurance Ground Water Monitoring is to be included in the regulations as an option for local agencies, the following changes should be made in the requirement.

* §2647(b)(2): There should be no requirement for installation of ground water assurance wells if the depth to ground water is greater than 100 feet. Vadose monitoring will detect leaking before this depth is reached. (See comment at subsection 2647(c)(1).)

* §2647(c)(1): Three wells should not be required if sufficient knowledge of local hydrology is demonstrated to permit fewer. In any case, only 1 well for every 30 feet of tank should be required.

  When considered together, §2647(c)(1) and §2646(b)(2) are in conflict with the exemption provisions. If vadose zone monitoring is used <u>instead</u> of ground water monitoring because ground water is greater than 5 feet below the tank (ref. §2646(b)(2)), then an "assurance ground water monitoring system" (3 wells) must still be installed for ground water between a depth of 5 feet and 100 feet (1 well for ground water between 100 feet and 200 feet). Therefore, there is essentially no exemption as provided in §2646(b)(2); if vadose monitoring is used, at least one ground water well will also be required unless ground water is greater than 200 feet in depth.

  In essence, a ground water monitoring well will always be required, whether as the primary means of leak detection or as part of the assurance ground water monitoring program. This is an unreasonable requirement. These two sections should be rewritten to remove this anomaly.

* §2647(c)(2): See comment at 2647(b)(2).

§2647(d)(5): Reduce required depth of drilling to 100 feet per previous comments.

* 2647(d)(6)(A): Requirement for 4-inch diameter casing is unnecessary and unreasonable. Change to 2-inch diameter.

* §2647(f): Proposed regulations require that soil borings be analyzed only for "...one or more of the most conservative constituents" stored in the tank. Requirements for ground water wells should be the same; not analyzed for <u>all</u> constituents stored in the tank.

- §2648(c): Cleaning all tools immediately <u>before</u>, rather than before <u>and</u> after drilling as proposed, should be sufficient.

- §2648(g): Analyses of "additives, cement, bentonite, and grouts" should not be required if compositions of these materials are available from the manufacturer.

- §2648(j): This subsection should be deleted since it has no regulatory meaning.

- §2648(k): Locking caps should not be required in a facility which limits access or maintains strict security.

5. <u>Article 5. Release Reporting Requirements</u>

- §2651(b)(2): The requirement to report clean-up costs should be deleted. This information can serve no regulatory purpose and actual clean-up costs frequently are not possible to determine. AB1362 includes no authority for this provision.

- §2651(b)(3): The requirement to provide copies of manifests should be deleted. The Department of Health Services adequately regulates the disposal of hazardous waste. This requirement constitutes duplicative regulation.

- §2652(a)(1): For purpose of clarity and consistency, a subsection (D) probably should be added to cover an unauthorized release that <u>cannot</u> be cleaned-up within eight hours.

- §2652(b): Delete "or should have been detected". Change "and" to "or". It is not clear how a release can be reported within 24 hours from the time "...it should have been detected". This requirement should be struck or clarified.

- §2652(c)(3): Delete "cost". See comment at §2651(b)(2).

- §2652(c)(4): This subsection should be deleted. See comment at §2651(b)(3).

6. Article 6. Allowable Repairs

No comments.

7. Article 7. Closure Requirements

- §2670(f): This subsection should be deleted. It is often unfeasible to plan "cessation of storage of hazardous materials" 45 days in advance of cessation. The tank operator should be allowed to continue monitoring the tank according to the permit until a closure plan is accepted.

- §2672(c)(2): This subsection requires "all piping associated with the tank shall be removed, handled, and disposed of as a hazardous waste". This assumes the piping is hazardous waste. A provision should be included to allow cleaning of the piping.

8. Article 8. Categorical and Site-Specific Variance Procedures

No comments.

9. Article 9. Local Agency Additional Standards Request Procedures

No comments.

10. Article 10. Permit Application, Annual Report and Trade Secrets Requirements

- §2711(9): Delete "previously". (See General Comment #3 for justification.)

- §2712(h): There is no justification for the requirement that tanks be inspected every three years. Tanks should be inspected every five years in conjunction with permit renewal.

CICC urges members of the Board to meticulously study the comments on these regulations and to give thoughtful consideration to the burden they place on the welfare of Californians. There can be no argument that the State must take all necessary steps to assure that its ground water is adequately protected from contamination.

To materially exceed the "necessary" level of protection will place a burden on the California economy which may well prove to be counterproductive. To require protection methods which provide a measure of insurance is justified. But to require such extensive redundancy as provided by the proposed regulations will not serve the best interests of our citizens.

CICC appreciates this opportunity to present its views on the proposed regulations and requests serious consideration for its concerns.

Sincerely,

Richard L. Davis

Richard L. Davis
Executive Director

97-e

CICC

CHEMICAL INDUSTRY
COUNCIL
OF CALIFORNIA

Executive Offices:
1121 L Street, Suite 904
Sacramento, CA 95814
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P.O Box 2567
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Executive Director:
Richard L. Davis

January 17, 1985

State Water Resources Control Board
Division of Water Quality
P. O. Box 100
Sacramento, CA 95801-0100

Greetings:

The Chemical Industry Council of California requests that this letter be included in the rule-making file for the Adoption of Regulations Governing Underground Storage of Hazardous Substances to be Codified in Subchapter 16 of Chapter 3 of Title 23 of the California Administrative Code.

We first wish to express our appreciation to the Board and Staff for providing ample opportunity for us to participate in the development of these regulations. We also appreciate your willingness to address the Council's concerns and for your tolerance throughout the development of these regulations.

For the record, there are still a few points which require attention or clarification. One major one, over which we realize you have no direct control, is the time schedule for compliance. The compliance dates currently contained in the regulations will result in wide-spread, involuntary non-compliance. We are sure that neither the Board nor the legislature intended to create such a situation, and that remedial action will be taken without delay.

It was our understanding at the latest hearing on these regulations that the two other points would be corrected in the final proposed draft. Instead, we note that they remain in the draft being proposed for adoption.

- §2631(f) refers to a "...24-hour, 100-year storm". This provision should be changed to "24-hour, 25-year storm" in accordance with 1984 legislative direction.

- §2650(c) This subsection requires the reporting of an unauthorized release within 24 hours after it "...should have been detected". We are not sure how one complies with this requirement since such an occurance cannot be reported until someone knows it has happened. If it is the intent of the Board to establish a penalty for failing to be diligent, we suggest a more workable provision should be enacted.

Your consideration of our remaining concerns will be greatly appreciated.

Cordially,

Richard L. Davis

Richard L. Davis

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COMMENTS

OF THE

CALIFORNIA LEAGUE OF FOOD PROCESSORS

ON

PROPOSED STATE WATER RESOURCES CONTROL BOARD

SUBCHAPTER 16 REGULATIONS

AT PUBLIC HEARING

October 23, 1984

Submitted by:

E. D. Yates, Vice President

CALIFORNIA LEAGUE OF FOOD PROCESSORS
1007 "L" STREET
SACRAMENTO, CALIFORNIA 95814
916/444-9260

COMMENTS OF THE
CALIFORNIA LEAGUE OF FOOD PROCESSORS
ON
PROPOSED STATE WATER RESOURCES CONTROL BOARD
SUBCHAPTER 16 REGULATIONS
AT PUBLIC HEARING, OCTOBER 23, 1984

INTRODUCTION

The California League of Food Processors appreciates the opportunity to comment on Proposed Subchapter 16 Regulations as they relate to the design, construction and operation of underground tanks storing hazardous materials.

The California League of Food Processors is a nonprofit trade association located at 1007 "L" Street, Sacramento, California 95814, 916/444-9260. Its 48 member companies produce approximately 75 percent of the canned foods processed in California, and 50 percent of frozen commodities. In a typical year the total industry packs well over 300 million cases of canned fruits and vegetables in more than 85 canning plants throughout the state, and directly employs upwards of 50,000 people during the peak processing season. The annual pack of canned fruits and vegetables in this state accounts for approximately 35 to 40 percent of the entire United States' production of these products. The annual frozen pack is in excess of one billion pounds.

Many in the food processing industry in California depend upon groundwater sources to supply processing needs. This water used in food processing, due to its food contact use, must be of high quality and meet all levels of regulations affecting food safety. As a result, the industry is obviously concerned with groundwater quality and any potential contamination which might bear upon the use of such waters in a food processing operation.

The food processing industry's interest in the proposed regulations stems from the fact that several materials are stored by food processors underground which would be subject to the proposed regulations. Generally they are petroleum products for the internal use of the facility, in the form of gasoline, No. 2 diesel fuel oil, and No. 6 residual fuel oil. In some cases caustic solutions used in food processing processes are also stored in tanks underground. Since most new food processing installations have been constructed utilizing above ground storage tanks, the League's interest is primarily focused upon the portions of the regulations dealing with existing underground storage tanks. In general, many of the underground tanks used by food processors is done so in an alternate stand-by fuel mode unlike other tank applications where large turnover of inventory occurs. As noted below, the League believes that each tank monitoring requirement should recognize the nature of the materials stored, frequency of tank utilization, and other applicable parameters.

Our major concern is with the monitoring requirements, which, insofar as food processors are concerned, may be more extensive than necessary for an effective program. We believe there are instances where, due to the site specific nature of the installation and/or the materials stored, that greater flexibility should be provided in achieving the same end result.

The following is a discussion of some general concerns, as well as some suggestions which the League believes will provide for equivalent level of monitoring and assurance against potential groundwater contamination from underground storage tanks used by food processors.

PROPOSED -EXISTING UNDERGROUND STORAGE TANK MONITORING CRITERIA

It is suggested that flexibility be provided by:

- Recognizing that often more than one tank is in a proximate location.

Thus, area-wide, rather than tank specific monitoring, may be appropriate and effective. The way the Regulation is written it appears that each tank would be treated individually, with the specified procedures required individually. For example, if 4 tanks were located next to each other, monitoring by soil testing and exploratory boring, vadose zone detection monitoring, groundwater leak detection monitoring, or other provisions, if required, should be provided for the area, and not necessarily for each tank.

- It is recommended that the Regulations be structured differently in at least two respects:

SEQUENTIAL MONITORING

1. Instead of several monitoring techniques being required simultaneously, a more efficient approach might be to require them sequentially. A reliable inventory control system can be an effective method of accounting for materials introduced, stored and withdrawn from the tank or tanks. Obviously, in the event the inventory control system detects an inbalance, confirmation by audit would be a reasonable next step. Upon confirmation of the inbalance, then depending upon the nature of the suspected loss, then pressure testing, or other reliable technique may be indicated. This would be followed by, again depending upon the character of the situation, exploratory soil monitoring as appropriate. If the materials contained in the tank were self-sealing, for example, lacquer or shellac, or very viscous, such as unheated No. 6 fuel oil, there may not be a need for further extensive, expensive monitoring. In the event a groundwater monitoring program is required, the Regulations should provide, where feasible and available, groundwater data and information from other agencies, or source of data rather than duplicating such information.

ACTIVE/POSITIVE APPROACH TO REGULATORY PROGRAM

2. The proposed regulations provide numerous exemptions in the event either a monitoring method is impossible, or ineffective. It appears that a showing (paperwork) must be made for each specified monitoring technique. The League believes that flexibility and efficiency, given the number of tanks to be monitored, can be achieved by an active approach, rather than the negative approach proposed. As proposed by the Regulations, a food processor would have to generate the information and data proving that each or several of the monitoring methods are not appropriate. It would be better to require a showing (paperwork) that the method employed is effective towards the legislative and regulatory goal of ensuring the integrity of underground tanks. In many cases, inventory and/or tank integrity testing procedures will provide sufficient protection. In other cases, the entire menu of monitoring techniques might be required. The League does not agree that a "worst case remedy" is applicable in all situations.

The comments below are in further detailed support of the general approach recommended above.

SECTION 2641 - VISUAL MONITORING

(a) Visual monitoring shall be utilized as the principal leak detection monitoring method, where feasible, for all or a portion of the exterior surfaces of an underground storage tank. All owners shall implement visual monitoring for <u>any</u> exposed portion of an underground tank ...

Question: Does this include the tank cover? (i.e., the top of the tank where the manhole cover is located).

(c,1)... all accessible exterior surfaces of a tank and the surface of the floor directly beneath the tank shall be monitored by direct viewing.

(c,2) Written routine monitoring procedure shall be prepared ...,

(c,3) Visual inspections shall be performed daily at a minimum ...,

Question: What if the highest level of the material in the tank does not contact the exposed portion of the tank? Is visual monitoring required? If so, for what purpose?

Mandated visual monitoring should consider the size and location of the exposed area.

(e) Visual monitoring of the exposed portion of a partially concealed tank shall not relieve an owner from implementing monitoring for the concealed portion of the tank using the other monitoring methods described in this article.

- All of the other stated monitoring methods are required. This per 2640 (e).

SECTION 2642 - UNDERGROUND STORAGE TANK TESTING

(a) all owners of underground storage tanks subject to this subchapter shall, except as provided in subsection (b) of this section implement a testing program pursuant to subsections (c) through (g) of this section.

Observation: Implementation of visual monitoring is included as an exemption. The regulations do not say so, but it must be assumed that the entire tank must be visible if other monitoring is not required (i.e., a tank located in a basement).

(c) Testing of underground storage tanks shall utilize a method capable of detecting a hazardous substance loss of at least .05 gph.

Observation: A loss of 0.5 gph equals 6½ oz. per hour or 1½ gallons/day. This based on the weight of a gallon of water. It has been indicated that pressure testing with air will provide information as to whether the tank leaks at all.

(f) Underground tanks which are found to lose product at a rate greater than, or equal to .05 gph shall be repaired or replaced.

Question: Where's the protection to groundwater if a leak of less than .05 gph exists?

SECTION 2643 - INVENTORY CONTROL

(a) All owners of existing underground tanks subject to this subchapter shall, except as provided for in subsection (b) of this section, implement an inventory control program described in sections (c) through (f) of this section.

(c) all tanks shall be individually monitored utilizing a daily inventory control system that takes into account daily tank quantity measurements ..., delivery records, records for outgoing product ...

(d) Tank quantity measurements shall be based on liquid elevation measurements which are:

1. Capable of measuring to one eighth of one inch;
2. Performed during periods of no tank additions or withdrawal;

and 5 other criteria.

Observations: Inventory control is a practical method of detecting leaks. However, inventory monitoring should be excluded for non-operating days, i.e., holidays, weekends, etc.

SECTION 2644 - SOIL TESTING AND EXPLORATORY BORING

(a) Except for those tanks that have been granted an exemption under subsection (b) of this section, all owners of existing underground tanks . . ., shall implement on evaluation . . ., to determine if prior usage of the underground storage tank has resulted in an unauthorized release.

(b) Exemptions ..., granted ..., if any of the following situations exist:

1. Proximity to physical obstacles prevent the positioning and operation of drilling equipment;
2. Soil conditions prevent drilling by any generally existing techniques.

Statement: Exemption should include those tanks that have undergone leak detection testing and have been found to be leak free.

SECTION 2645 - VADOSE ZONE MONITORING

(a) All owners of existing underground tanks ..., shall ..., implement a vadose zone monitoring system.

(c) Vadose zone monitoring may consist of vapor monitoring or soil-pore liquid monitoring or a combination of both methods.

SECTION 2646 - GROUNDWATER LEAK DETECTOR MONITORING

(a) All owners of existing underground storage tanks ..., shall, except, as provided for in subsection (b) of this section, implement a groundwater leak detection monitoring system.

(b,2) A vadose monitoring system has been implemented and groundwater is and will remain at least 5 feet below the invert of the tank.

(c) At those sites at which vadose zone monitoring is feasible and the groundwater level fluctuates above and below a point 5 feet below the tank invert, a combination of groundwater monitoring and vadose monitoring shall be used. The groundwater monitoring wells shall extend 20 feet below the lowest anticipated groundwater level in order to provide assurance monitoring.

(d) When the groundwater level is continuously above a point 5 feet below the tank invert, groundwater monitoring shall be used as the principal leak detection technique, and vapor monitor will also be used in conjunction wherever possible.

SECTION 2647 - ASSURANCE GROUNDWATER MONITORING

(a) All owners of existing underground storage tanks except as provided in part (b) ..., implement an assurance groundwater monitoring system.

(b,1) Groundwater monitoring is the principal means of leak detection.

(b,2) The highest groundwater level possible during the life of the facility is at a depth greater than 200 feet.

(c) Assurance groundwater monitoring shall be established according to the following criteria:

1. ..., anticipated groundwater elevations is between a depth of 5 feet below the tank invert and 100 feet below the surface of the ground ...,

2. ..., anticipated groundwater elevation is between 100 and 200 feet . . ., the well shall extend to the base of the aquifer or to a depth of 200 feet whichever is lessor;

Observation: These monitoring wells are of a depth that upstream contaminated water moving through this zone could be detected. However, this detection does not necessarily mean that the tank directly above this zone is leaking.

Given the nature, as described above, of tanks utilized by the food processing industry, the League would urge that the Board act to provide flexibility and efficiency of resources by using a sequential monitoring approach in adopting the proposed Subchapter 16 Regulations.

Submitted by:

E. D. Yates, Vice President

California League of Food Processors
1007 "L" Street
Sacramento, California 95814
916/444-9260

October 23, 1984

98 B

COMMENTS

OF THE

CALIFORNIA LEAGUE OF FOOD PROCESSORS

BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

ON

PROPOSED ADOPTION OF REGULATIONS GOVERNING UNDERGROUND STORAGE OF HAZARDOUS SUBSTANCES TO BE CODIFIED IN SUBCHAPTER 16 OF CHAPTER 3, TITLE 23, CALIFORNIA ADMINISTRATIVE CODE [23 CAC §§2610 - 2648]

AT PUBLIC HEARING

November 27, 1984
Sacramento, California

Submitted by:

E. D. Yates, Vice President

CALIFORNIA LEAGUE OF FOOD PROCESSORS
1007 "L" STREET
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COMMENTS OF THE
CALIFORNIA LEAGUE OF FOOD PROCESSORS
ON
PROPOSED STATE WATER RESOURCES CONTROL BOARD
SUBCHAPTER 16 REGULATIONS
AT PUBLIC HEARING, NOVEMBER 27, 1984

INTRODUCTION

The California League of Food Processors appreciates the opportunity to comment on the revised Proposed Subchapter 16 Regulations as they relate to the design, construction and operation of underground tanks storing hazardous materials. The League tendered written comments on the earlier proposal at the October 23, 1984 Public Hearing.

COMMENTS ON NOVEMBER 9, 1984 DRAFT PROPOSED REGULATIONS

The California League of Food Processors requests the consideration of its proposal for a change to Draft Section 2641. "Monitoring Alternatives". The League believes that its proposal for existing alternate fuel oil storage satisfies the objectives of the Draft Regulation in determining whether unauthorized releases are occurring, and detecting future unauthorized releases (Article 4, Section 2640(a) and (b).

BACKGROUND INFORMATION

In general food processing facilities' existing underground storage tanks are used for fuel oil, typically No. 2 diesel, No. 6 residual, or a viscosity in between. These tanks have been installed during the past 30 years as a requirement for receiving natural gas from utilities under conditions directed by the California Public Utilities Commission. Natural gas is the primary fuel of the food processing industry. This situation continues as evidenced by special natural gas rates created for food processors and others capable of utilizing oil as a boiler fuel. In most instances fuel oil storage and use continues to be characterized as "stand-by" in the event of a curtailment of natural gas.

CALIFORNIA LEAGUE OF FOOD PROCESSORS PROPOSED MONITORING ALTERNATIVE FOR FUEL OIL STORAGE AND USE

A. STAND-BY MODE - No input or withdrawals of fuel oil.

1. Gauging Program - Consisting of an initial oil level check then four gaugings at weekly intervals followed by monthly gauging. Gauging would be done at the existing level within the tank as there is little need to either fill or drain a stand-by tank to its "most sensitive measuring level", (if one exists). If a discrepancy of + or - 5 gallons exists, checks would be conducted daily to identify and confirm the discrepancy.

2. Tank Testing - Would be initiated if the daily check above indicates variations exceeding 10 gallons or other appropriate measure commensurate with tank size and character of the fuel.

B. STAND-BY/CURTAILMENT MODE

1. Gauging - Same as A.1. above.

2. Inventory Reconciliation - conducted in the event a curtailment of natural gas occurs and/or oil is used, replaced, or added to the tank. Gauging would be required prior to and following withdrawals and additions (A.1. and A.2. above).

C. SEASONAL FUEL OIL USE MODE

1. Gauging and Inventory Reconciliation - During seasonal use, employ B.2. above.

2. Gauging - During non-season (A.1. above)

ADDITIONAL COMMENTS

- The term "small tank" as used at Monitoring Alternative 7, page 4.18, is not defined.

- Tank testing - it is requested that flexibility be provided concerning the frequency of required tank tests. This would allow, in those cases deemed appropriate, for greater utilization of resources.
- Empty tanks - Flexibility should be provided for existing empty underground tanks which may have been used in the past, and most likely will be used again.

SUMMARY

The California League of Food Processors believes that its proposal meets the objectives of the Underground Tank Monitoring Program, of determining and detecting unauthorized releases. For fuel oil tanks used in a stand-by/curtailment/seasonal mode, a sequential approach is urged. Gauging, inventory reconciliation, and where necessary, tank testing, is recommended for storage tanks of fuel oil with moderate or no inventory turn over.

Respectfully submitted:

E. D. Yates, Vice President

California League of Food Processors
1007 "L" Street
Sacramento, California 95814
916/444-9260

November 27, 1984

ADDENDUM TO COMMENTS OF THE
CALIFORNIA LEAGUE OF FOOD PROCESSORS
ON DRAFT SUBCHAPTER 16 REGULATIONS
NOVEMBER 27, 1984

ADDENDUM

- Section 2641 (7)(b)(ii) - It is suggested that the words "the same person" be deleted and replaced with "a person familiar with the procedure". It is simply overly burdensome to require the same person to perform measurement at five day intervals.
- The League believes that its sequential proposal for gauging inventory reconciliation, and where indicated, tank testing, should be applicable to new tanks installed and used in a stand-by/curtailment/seasonal fuel use mode.
- Tank test costs appear to range from $500 to $2,000 per tank. The League believes that the up front tank testing required in the Draft for existing tanks is overly burdensome and the League's proposal can operate on an equivalent basis of determining and detecting unauthorized releases.
- The League previously suggested (10/23/84) that, in the event extensive soil testing, exploratory boring, vadose zone detection, etc., is required, then an area wide approach may be appropriate and effective in those instances where a number of tanks are in a proximate location.

November 27, 1984

98-D

California League of Food Processors

ROBERT W. ZWISSIG
CHAIRMAN
O.A. CERUTTI
VICE CHAIRMAN
LAWRENCE K. TABER
PRESIDENT
E.D. YATES
VICE PRESIDENT

January 17, 1985

State Water Resources Control Board
Division of Water Quality
Post Office Box 100
Sacramento, California 95801-0100

RE: *Adoption of Regulations Governing Underground Storage of Hazardous Substances to be Codified in Subchapter 16 of Chapter 3 of Title 23 of the California Administrative Code.*

COMMENTS OF THE CALIFORNIA LEAGUE OF FOOD PROCESSORS

The League previously submitted comments on the proposal at Public Hearings held October 23 and November 27, 1984. In accordance with the State Water Resources Control Board's notice dated January 3, 1985, the comments which follow are restricted to the changes which are embodied in the text of the proposed regulations, as further amended (Draft of December 28, 1984). The League's primary interest remains focused on Article 4, "Existing Underground Storage Tank Monitoring Standards", Section 2641, Monitoring Alternatives, which appears to be drafted as new text as evidenced by extensive double-underlining of this section in the December 28, 1984 version.

In comparing the previous draft to the new draft, it would appear that only several changes have been made, which has led to some confusion.

In connection with Monitoring Alternative 7, "Underground Storage Tank Gauging and Testing", the League would recommend that (B)(iii) be amended to provide for tank testing on a less frequent basis, provided the objectives of Subchapter 16 are achieved. This could be accomplished in situations where no deviant recordings occur when gauging.

We would urge the Board to provide flexibility by providing, following an initial tank test, subsequent testing only when gauging readings are deviant.

Very truly yours,

CALIFORNIA LEAGUE OF FOOD PROCESSORS

Ed Yates

E. D. Yates
Vice President

EDY/gr

#99

LEIGHTON and ASSOCIATES
INCORPORATED

SOIL ENGINEERING GEOLOGY GEOPHYSICS GROUND WATER HAZARDOUS WASTES

October 22, 1984

State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95801

Attention: Mr. Harold Singer
Division of Technical Services

Listed below are several questions Leighton & Associates wishes that the State Water Resources Control Board address concerning the following draft regulation:

California Administrative Code
Title 23 Waters
Chapter 3 Water Resources Control Board
Subchapter 16 Regulation for Storage of Hazardous Substances

Section 2644 (d) Why choose 50 feet below the invert of the storage tank. Forty feet below grade is more reasonable, unless soil contamination is still evident, and if so continue the boring to 10 feet below visual/odor/detectable soil contamination.

Section 2644 (e) How do you define undisturbed? What soil sampler do you recommend? Samples are boing collected for possible lab sampling not soil property testing.

Section 2645 Isn't vadose zone and groundwater monitoring together redundent? Either system should be implemented, but not together. For example if the water table is less than 20 feet below grade the groundwater monitoring should be implemented. If the water table is between 20 - 40 feet and the natural soils are sand and gravel then implement groundwater monitoring. However, if the natural soils are fine grained then implement a vadose monitoring system at the base of the backfill material.

Section 2645 (h) What levels should a vadose monitoring alarm system be set to go off when monitoring petroleum hydrocarbon vapors? % LEL, % gas vapors etc?

Section 2646 (b)(2) and (c) are contradictory. Section 2646 (b)(2) indicates ground water monitoring is not required if the water table is 5 feet below the invert of the underground tanks and a vadose monitoring system is in place. However, section 2646 (c) indicates if the water table moves below a point 5 feet below the invert of the

Section 2646 continued.

tank then it will be required to implement both a groundwater and vadose monitoring system. Which is correct?

What monitoring system is required if a clay layer is encountered at grade and it's thickness is greater than 5 feet? What well design is required?

Section 2647 (b)(3) Should 500 feet be 50 feet as in Section 2646 (b)(3)?

Section 2647 Does the Board realize a 200 foot well could cost approximately $10,000? This cost is prohibitive to many small or large businesses who use underground storage tanks.

Section 2647 (c)(b) This well design would create an excellent pathway to contaminate a deep unconfined aquifer. Does the Board realize this?

Section 2647 (b)(c) Drilling thru a confining layer to encounter the confined aquifer would contaminate the confined aquifer if the upper aquifer is contaminated. Why is it necessary to monitor a confined aquifer if an unconfined aquifer exists above the confined aquifer?

Section 2648 (m) This is very impractical. Can this be re-written such that the owner shall have on file all the information required under this section?

Respectfully yours,

LEIGHTON AND ASSOCIATES, INC.

Thomas E. Mills

Thomas E. Mills
Project Hydrogeologist

#100

I am Bob Shuster, owner and operator of Shuster Oil, a small jobbership located in Escondido, Ca. We distribute petroleum products to commercial, agricultural and governmental accounts.

I am here also representing San Diego County Petrolem Distributors, whose membership is composed of jobbers with a similar customer structure to mine.

We are not involved in the retail service station business. We operate the smaller tank trucks, known as bob-tails or tank wagons, serving business, agricultural and governmental accounts that have underground storage tanks located on their own properties.

As the proposed regulations now stand -- i.e. regarding the drilling and installation of monitoring wells for each underground tank, regardless of size or thruput -- the result would be devastating on our customers.

When advised of the costs and bureaucratic reporting required by the new regulations, an overwhelming number of our customers indicate that they will stop using their on-sight tanks and look to service stations for their fuel supplies.

This will effectively destroy our business.

It is important to note that our bulk fuel customers do not enjoy cut-rate prices with 'home' delivery. In fact, jobber prices range from 8 to 10 cents per gallon more than at the average service station.

On site tanks are important to our customers for reasons that include the following: product use security, efficient use of employee time in fueling, speedly availabilty. Some of my private enterprise customers who simply could not operate without on site tanks included: packing company whose trucks require 1200 gallons of diesel per week, an ambulance company and numerous sub-contractors in the construction field.

As important -- in the event of another petroleum "crunch" as we had in the recent past, these affected businesses would no longer have a historic purchasing record of petroleum products and will be faced with shut-downs, or at best 'slow-downs' due to long lines at the corner gas station.

A whole distribution chain will be destroyed if the regulations, as currently proposed are adopted.

The cost of monitoring wells are the same for a small tank owner as they are for larger tanks owners. It is my understanding that the cost per well approaches and may exceed $9000 per well.

Article 2611 - exemption A-3, relates to underground tanks which are located on a farm and are used only to propel unlicenced vehicles used principally for agricultural purposes. Why can't the rule include licenced vehicles the farmer uses to conduct normal farm-related tasks, such as part repair errand, farm product delivery and supply trips to town?

I suggest that the regulation is not consistant with the intent of AB 1362 and is totally unrealistic in terms of compliance. The farm operator has historically used the product stored in his underground tanks for farm mult-purposes -- why create addtional hardship by disturbing that practice?

Another area of concern is the fee charged for application for a site-specific variance. The $7,750 fee puts compliance out of reach of small businesses. On top of it all, there is no guarentee that the variance will be granted.

Independent oil jobbers supply 85 to 90% of the petroleum requirements of small businesses, agricultural and governmental agencies.

We believe that customers who purchase petroleum products for their own consumption in their own underground tanks should be exempt from the regulations as proposed -- per the Small Business Impact Statement, item 4, as found in the Notice of Public Hearing, held October 23, 1984.

We do not feel that it is the intention of AB 1362 to force small businesses into such costly compliance methods or to force petroleum jobbers out of business.

Thank you for your time and attention to our very real concerns.

Bob L. Shuster
Shuster Oil Company
P.O. Box 456
Escondido, Ca. 92025

619 745-0591

#100-D

My name is Bob Shuster. I am the owner of Shuster Oil & Chemical Company in Escondido, California. I am representing the oil jobbers and small business tank owners of north San Diego County at this undrground tank regulation hearing.

Regarding Section 2635 - General Construction Standards, (b), item 4: It states that "single-walled primary containers of steel and the outer surface of double-walled underground storage tanks constructed of steel, with or without coatings, shall be protected by a properly installed, maintained and monitored cathodic protection system."

What is the rational behind item 4? Why does a double-walled steel tank, with the outer shell coated with a fiber glass or a resin-type coating, (specifically the type manufactured by Joor Tank, known as Plasteel Tanks), need the additional protection of a cathodic type?

In reading further into item 4, I do not see where this type of tank is exempt. It looks like the staff is creating "overkill," again.

Regarding (b), item 8 of the same section: If the fill is made through the tight elbow system, why is a spill catchment basin required or an alarm needed? In the event of an overfill condition the product automatically ceases to flow with a tight connection.

Regarding (b), item 9a: Too restrictive. In the case of commercial accounts, the driver is the one who is responsible for determining whether or not the tank will hold all of the product.

Section 2641 - Monitoring Alternatives, #7, item 1: "Small" needs defining or removing from the text. Why limit size?

Section 2641, table 4.1 - Monitoring Alternatives, item 8.1: Why is the time limited to three years?

Item 8.3: Refers back to item 7, tank description -- once again the word "small" is not definitive enough.

In December 1984, I sent letters, along with tank registration forms to all of my customers, urging them to register their tanks prior to January 1, 1985. I committed business suicide. So far, 12 to 15 per cent of my customers have already abandoned their tanks and have either pulled them out or slurry-filled them. I don't know how many tank owners finally registered their tanks. I do know that I have been deluged with telephone calls from confused and concerned businessmen.

The entire program requires excessive reporting which the samll business owner will not do. Instead, he will cease to use his underground storage and resort to purchasing product from the corner service station.

The regulations, as presented, force the small jobber out of business by destroying his customer base. Score -- small business "0", big business "1", government "10".

Section 2644. (c) - Inventory Reconciliation: Unattended cardlocks or Keylocks open on weekends for withdrawals will require an inventory for each day that there are withdrawls from the tank. This is not practical. The locations are unattended on weekends although customers are able to draw fuel. Why not allow inventory reconciliation to trake place on the next normal working day? No loss will be so great that it cannot be checked through normal inventory control on the next working day.

Thank you for your consideration and positive action on the points I have raised.

Respectfully submitted,

Bob L. Shuster
Shuster Oil & Chemical
P.O. Box 456
Escondido, Ca. 92025

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