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MOONLITE ASSOCIATES LLC

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8 STATE WATER RESOURCES CONTROL BOARD
STATE OF CALIFORNIA
9

10 In Re:	Case No.:
11 Former Moonlite Cleaners 2640 El Camino Real, 12 Santa Clara, Santa Clara County, California 95051	PETITION FOR REVIEW OF REGIONAL WATER QUALITY CONTROL BOARD LACK OF ACTION; REQUEST TO HOLD PETITION IN ABEYANCE

14
15 **INTRODUCTION**

16 Petitioner Moonlite Associates LLC ("Petitioner"), pursuant to California Water Code
17 Section 13320 and Title 23 of the California Code of Regulations Section 2050-2068,
18 respectfully requests that the State Water Resources Control Board ("State Board") review the
19 failure to act of the California Regional Water Quality Control Board, San Francisco Bay Region
20 ("Regional Board") in response to the letter dated October 24, 2011, sent on behalf of Moonlite
21 Associates LLC ("Moonlite"), the current property owner, with respect to the former Moonlite
22 Cleaners site located at 2640 El Camino Real, Santa Clara, County of Santa Clara, California
23 ("Property" or "Site").

24 1. Name and Address of Petitioner:
25 Moonlite Associates LLC
1111 Bayhill Drive, Suite 450
26 San Bruno, CA 94066

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28 ///

1 Any and all Notices for Petitioner should be forwarded to Petitioner's Counsel:

2 Lori J. Gualco
3 GUALCO LAW
4 400 Capitol Mall, Eleventh Floor
5 Sacramento, CA 95814
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7 Facsimile: (916) 930-0705
8 Email: ljgualco@gualcolaw.com

9 2. Specific Failure to Act of the Regional Board which Petitioner Requests the State
10 Board Review:

11 Petitioner requests a review of the failure to act by the Regional Board in response to the
12 letter dated October 24, 2011 sent on behalf of Moonlite Associates LLC requesting that United
13 Artists and the City of Santa Clara be named as Responsible Parties under all Water Code
14 Section 13267 letters and the email response from Nathan King sent to Petitioner's counsel on
15 November 18, 2011.

16 3. The Date on which the Regional Board failed to act: Within 60 days of the October 24,
17 2011 letter (attached hereto as Exhibit "A") and within 30 days of the date the RWQCB
18 responded in a November 18, 2011 email sent by Nathan King (attached hereto as Exhibit "B").

19 4. The Reason the Failure to Act was Improper:

20 As set forth more fully in the Memorandum of Points and Authorities below, the
21 Regional Board 1) failed to name dischargers in a manner consistent with the State Board rules
22 and policies; and 2) failed to name all responsible parties as it excludes a) the City of Santa Clara
23 ("City") that owns and controls the sanitary sewer, from which there is evidence of the release of
24 tetrachloroethene ("PCE") into soil and groundwater; and b) United Artists Theater Circuit, Inc.,
25 a wholly owned subsidiary of Regal Entertainment Group ("United Artists"), a former owner of
26 the Property.

27 5. The Manner in which Petitioner is aggrieved:

28 The Regional Board's actions have aggrieved Moonlite Associates LLC because the
inaction has caused the Petitioner to solely incur significant costs in the investigation of the
Property, surrounding properties, and the sewer system near the Property. As a result of these
expenditures, there has been and will continue to be serious economic consequences to its

1 business operations unless the State Board directs the Regional Board to name the City of Santa
2 Clara and United Artists as Responsible Parties. Furthermore, without the participation of the
3 City of Santa Clara, contaminants will continue to be released from its sewer system.

4 6. The State Board Action Requested by Petitioner:

5 As mentioned above, Moonlite requests that this matter be held in abeyance. If it becomes
6 necessary for Moonlite to pursue its appeal Petition, Moonlite will request that the State Board
7 order the Regional Board to respond to Moonlite's October 24, 2011 letter and include the City
8 of Santa Clara and United Artists as responsible parties and make a determination that the failure
9 to act is arbitrary and capricious or otherwise without factual or legal basis.

10 7. Statement of Points and Authorities in Support of Legal Issues Raised in the Petition

11 For purposes of this protective filing, the Statement of Points and Authorities is included in
12 Section 7 of this Petition. Moonlite reserves the right to file a Supplemental Statement of Points
13 and Authorities, including references to the complete and administrative record and additional
14 evidence, if it becomes necessary to pursue this Petition. Moonlite also reserves its right to
15 supplement its request for a hearing to consider testimony, other evidence, and argument.

16 8. Statement Regarding Service of the Petition on the Regional Board and Named
17 Dischargers

18 A copy of this Petition is being sent to the Regional Board, to the attention of Bruce H.
19 Wolfe, Executive Officer; the City of Santa Clara; and United Artists by U.S. mail, postage
20 prepaid. By copy of this Petition, Moonlite is notifying each party listed above of its request that
21 the State Board hold the Petition in abeyance.

22 9. Statement Regarding Issues Presented to the Regional Board/Request for Hearing

23 The Regional Board failed to include the City of Santa Clara and United Artists as
24 additional responsible parties in a Water Code Section 13267 letter and failed to include them in
25 all current requests for work to be conducted at the Property. Moonlite requests a hearing in
26 connection with this Petition and the opportunity to present any evidence not previously
27 considered by the Regional Board to establish facts in support of this Petition, including those
28 described more fully in Part 7 above.

1 For all of the foregoing reasons, Moonlite respectfully requests that the State Board
2 review the failure of the Regional Board to act and grant the relief set forth above.

3 A. Raising of Substantive Issues Before the Regional Board

4 In the event this Petition is made active, Petitioner will submit an amended Petition
5 including a statement that the substantive issues and objections raised in the petition were raised
6 before the Regional Board, or an explanation of why Petitioner was not required or was unable to
7 raise these substantive issues or objections, before the Regional Board.

8 B. Request to Present Supplemental Evidence

9 In the event this Petition is made active, Petitioner reserves the right to request the State
10 Board consider evidence not previously considered by the Regional Board. Petitioner will submit
11 an amended petition containing a statement that additional evidence is available that was not
12 presented to the Regional Board or that evidence was improperly excluded by the Regional
13 Board and detailing the nature of the evidence and of the facts to be proved. If the evidence was
14 not presented to the Regional Board, Petitioner will provide a detailed explanation of the reasons
15 why the evidence could not previously have been submitted. If Petitioner contends that the
16 evidence was improperly excluded, the request will include a specific statement of the manner in
17 which the evidence was improperly excluded.

18 C. Request for Hearing before the State Board

19 In the event this Petition is made active, Petitioner reserves the right to request a hearing
20 before the State Board to consider testimony, other evidence, and argument. Petitioner will
21 submit an amended petition containing a summary of contentions to be addressed or evidence to
22 be introduced and a showing of why the contentions or evidence have not been previously or
23 adequately presented.

24 **BRIEF FACTUAL BACKGROUND**

25 A. SITE DESCRIPTION

26 The Site is located within the Moonlite Shopping Center, which is a multi-tenant retail
27 shopping center located in Santa Clara, California. The former Moonlite Cleaners conducted dry
28 cleaning within an approximately 3,000 square-foot tenant space (2640 El Camino Real) at the

1 Moonlite Shopping Center. The Moonlite Shopping Center is bounded by: El Camino Real to the
2 north; Bowe Avenue and Saratoga Creek to the east, a service alley, multi-family residential
3 development and a bowling alley to the south; and Kiely Boulevard to the west.

4 Features at and near the Moonlite Shopping Center include: the City of Santa Clara
5 sanitary sewers within the service alley south of the shopping center building and within Bowe
6 Avenue; a sewer siphon beneath Saratoga Creek; roof-mounted ventilation systems servicing
7 each tenant space; and asphalt paved parking areas to the north of the shopping center building.
8 A Chevron retail gasoline station formerly operated northwest of the Moonlite Shopping Center.
9 In addition, a dry cleaner, Perfect Cleaners/Jim's Cleaners, operated at 1520 Kiely Boulevard, to
10 the west of the Moonlite Shopping Center.

11 B. BACKGROUND

12 Between 1961 and 1997, Moonlite Cleaners conducted dry cleaning operations within the
13 2640 El Camino Real tenant space at the Moonlite Shopping Center. Moonlite Cleaners used
14 PCE in its dry cleaning operations. After 1997, Moonlite Cleaners moved to another tenant
15 space (2720 El Camino Real) within the Moonlite Shopping Center and operated a "drop-off
16 only" store, i.e., no on-site dry cleaning. The former Moonlite Cleaners' tenant space is currently
17 occupied by Cosmos Gift Shop, a retail sundry and small appliance store.

18 Investigations have been conducted at the Moonlite Shopping Center since 2004. In 2004,
19 groundwater investigations revealed the presence of volatile organic compounds (VOCs)
20 including PCE in groundwater up to 86.7 micrograms per liter ($\mu\text{g}/\text{l}$). Between February and
21 March 2009, soil gas, indoor air and groundwater investigations were conducted at the Site.
22 Laboratory analysis of the soil gas samples collected from beneath the former Moonlite Cleaners
23 tenant space in March 2009 revealed PCE up to 5,700,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).
24 Laboratory analysis of indoor air samples collected in March 2009 from within the former
25 Moonlite Cleaners tenant space revealed PCE up to 150 $\mu\text{g}/\text{m}^3$. Laboratory analysis of
26 groundwater samples collected from borings and monitoring wells revealed PCE up to 360 $\mu\text{g}/\text{l}$.
27 In addition, five subslab horizontal soil vapor extraction (SVE) pipes were installed beneath the
28 building including 2640 El Camino Real and a SVE pilot test was conducted.

1 In October 2009, prior to startup of the SVE system, additional indoor air samples were
2 collected from within the former Moonlite Cleaners tenant space. Laboratory analysis of the
3 indoor air samples revealed PCE up to $100 \mu\text{g}/\text{m}^3$ as well as 1,4-dichlorobenzene (1,4-DCB) up to
4 $97.3 \mu\text{g}/\text{m}^3$ (WEST, 2009b).

5 In December 2009, additional soil gas sampling was conducted north of and within the
6 alley south of 2640 El Camino Real. Laboratory analysis of the soil gas samples revealed higher
7 concentrations of VOCs including PCE in the samples collected at 10-feet below ground surface,
8 than the samples collected at 5-feet below ground surface. In addition, other VOCs not related to
9 dry cleaning including ethanol, 1,3-butadiene, benzene, toluene, ethyl benzene, xylenes and
10 acetone were detected in the soil gas samples.

11 In February 2010, the SVE system was connected to the subslab horizontal SVE pipes and
12 began operation. Following SVE system startup, additional indoor air sampling was conducted
13 in April and May 2010. Laboratory analysis of the April and May 2010 indoor air samples
14 collected from 2640 El Camino Real revealed PCE indoor air concentrations up to $12.7 \mu\text{g}/\text{m}^3$,
15 below the Site-specific preliminary remediation goal (PRG) of $14 \mu\text{g}/\text{m}^3$.

16 Between June and October 2010, depth-discrete groundwater samples were collected from
17 locations north of 2640 El Camino Real; near the downgradient edge of the Moonlite Shopping
18 Center; and north of the SaveMart store and downgradient of a sewer main depicted on the City
19 of Santa Clara sewer maps. Laboratory analysis of the depth-discrete groundwater samples
20 revealed PCE up to $1,020 \mu\text{g}/\text{l}$ in the sample collected north of the SaveMart and that the vertical
21 extent of PCE is limited to the upper 37-feet near 2640 El Camino Real. Surface water samples
22 were also collected from locations immediately upstream and downstream of the sewer siphon
23 beneath Saratoga Creek, as well as from a seep observed emanating from the eastern edge of
24 Saratoga Creek. Laboratory analysis of the surface water samples revealed PCE ranging from
25 $36.4 \mu\text{g}/\text{l}$ (C4; downstream) to $61.5 \mu\text{g}/\text{l}$ (C5; upstream). PCE was also detected at $402 \mu\text{g}/\text{l}$
26 (Seep-1) in the sample collected from the seep. In addition, one soil gas sample was collected
27 within the downgradient residential neighborhood northeast of Saratoga Creek. Laboratory
28 analysis of the soil gas samples, SG26, revealed PCE at $250 \mu\text{g}/\text{m}^3$ in the sample collected at 5-

1 feet below ground surface.

2 In November 2010, vertical SVE wells were installed north of 2640 El Camino Real and
3 within the alley south of the shopping center buildings. The vertical SVE wells were connected
4 to the SVE system in December 2010. Laboratory analysis of soil vapor samples collected from
5 the vertical SVE wells revealed PCE up to 130,000 $\mu\text{g}/\text{m}^3$ in the sample collected from VE11
6 located northeast of 2640 El Camino Real.

7 Recent investigations were conducted between April and September 2011. The recent
8 investigations included: exploratory trenching; CCTV sewer inspection; additional depth-discrete
9 groundwater sampling; installation of nested monitoring wells; installation of additional vertical
10 SVE wells; and installation of a vapor monitoring well.

11 Two exploratory trenches were advanced to approximately 6-feet below ground surface
12 and perpendicular to the suspected sewer main alignment located north of the SaveMart store.
13 The sewer main was not observed in the exploratory trenches. PCE was detected in soil samples
14 collected from the exploratory trenches up to 86 micrograms per kilogram ($\mu\text{g}/\text{kg}$). The CCTV
15 inspection was conducted in July 2011 and identified sewer defects within the City of Santa
16 Clara's sewer mains including sags, broken pipe, exposed soil, surcharge conditions and grease
17 buildup. In August 2011, four additional depth-discrete groundwater samples were collected
18 within the alley near previous boring B6. PCE was detected between 42.5 $\mu\text{g}/\text{l}$ (B45) and 743
19 $\mu\text{g}/\text{l}$ (B44). In August 2011, two nested monitoring wells were installed near Bowe Avenue
20 (MW4/MW4A) and near the former Moonlite Cleaners (MW5/MW5A). In addition, two vertical
21 SVE wells were installed north of the RiteAid store and one vapor monitoring well near the
22 northwest corner of the shopping center.

23 Groundwater monitoring conducted in September 2011 revealed PCE: at 1,280 $\mu\text{g}/\text{l}$
24 (MW4) and 21.5 $\mu\text{g}/\text{l}$ (MW4A) near Bowe Avenue and the City of Santa Clara sewer main; at
25 315 $\mu\text{g}/\text{l}$ (MW5) and 1,130 $\mu\text{g}/\text{l}$ (MW5A) northeast of the former Moonlite Cleaners; and at 891
26 $\mu\text{g}/\text{l}$ (MW3) north of the SaveMart store. Based on the findings from the recent investigations,
27 the Site has been adequately characterized to proceed with evaluation of potential remedial
28 technologies.

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C. DRY CLEANING

A review of the City of Santa Clara building department records and historical telephone directories indicated that Moonlite Cleaners operated a dry cleaning store at 2640 El Camino Real between approximately 1961 and 1997 (EDR, 2010a; City of Santa Clara, 2010). PCE was used in the dry cleaning process. Wastewater from the dry cleaning operations was discharged to the sanitary sewer. The sanitary sewer is located on the south side of the Moonlite Shopping Center in a service alley. In 1997, Moonlite Cleaners moved to 2720 El Camino Real and currently operates a drop-off only dry cleaning store.

D. SUBSURFACE UTILITIES

City of Santa Clara Building Department records indicated that during Site development in 1961, an 8-inch vitrified clay pipe sewer main was installed trending east to west within the alley behind the shopping center buildings. The drawing also indicated that a 6-inch cast iron sewer line transected south-southeast. The alignment of the 6-inch cast-iron sewer crossed beneath the shopping center building near 2640 El Camino Real.

The 2008 City of Santa Clara sewer map depicts a sanitary sewer main within the alley that connects with the sewer main in Bowe Avenue. The sewer main in Bowe Avenue flows south to north toward El Camino Real. The 2008 drawing also depicts a sewer main on the Site that trends west to east along the northern side of the SaveMart store and connects to the sewer main within Bowe Avenue.

The sewer main in Bowe Avenue connects to the sewer main within El Camino Real on the west side of Saratoga Creek. The sewer main in El Camino Real flows west to east and beneath Saratoga Creek by way of a siphon. The siphon extends beneath the existing creek bed then is connected to the sewer main on the east side of Saratoga Creek within El Camino Real.

United Artists

In March 2011, my office, on behalf of Moonlite, the current property owner, forwarded extensive documentation regarding United Artists' development and ownership of the Property. As presented in the documents provided to the Regional Board, United Artists (formerly United California Theaters) developed the Moonlite Shopping Center in 1961. United Artists (as United

1 Artists Theatre Circuit, Inc.) continued to own and operate the Moonlite Shopping Center until
2 1975. In 1975, United Artists sold the Moonlite Shopping Center, but continued as the Master
3 Lessor until 1978, including subleasing tenant space to Moonlite Cleaners until 1978.

4 The former Moonlite Cleaners operated at the Site between 1961 and 1996. United Artists
5 owned, controlled and/or operated the Moonlite Shopping Center with the dry cleaner as a tenant
6 for 17 of those years, half the time of operation and when less sophisticated equipment and
7 practices were used by operators. United Artists leased the tenant space to Moonlite Cleaners
8 and had control over the tenants' operations from 1961 to 1978. In addition, United Artists
9 through its lease agreement had knowledge of the activities that resulted in releases of PCE and
10 had the authority to prevent such activities by the dry cleaners during this period.

11 Recent environmental investigations conducted at the Site have shown that the dry cleaner
12 solvent PCE was released to soil, soil gas and groundwater beneath the Site during the period
13 United Artists owned and managed the property, e.g., contamination at depth when groundwater
14 elevations were lower. In addition, the distribution of PCE in the subsurface has been correlated
15 to releases when flow directions were controlled by the lower groundwater elevations during the
16 1960s and 1970s.

17 In accordance with the State Water Resources Control Board (SWRCB) Policy on Naming
18 Dischargers (Attwater, 1992), "prior landowners and lessees should be named if they owned or
19 were in possession of the site at the time of discharge, had knowledge of the activities which
20 resulted in the discharge, and had the legal authority to prevent the discharge (numerous orders,
21 including WQ 85-7, 86-15, 91-7 and 92-13)." For these reasons, United Artists should be
22 required as a discharger to address the release of PCE at the Property.

23 City of Santa Clara

24 Recent investigations provide definitive data showing releases have and are occurring
25 from the City of Santa Clara wastewater collection system. Recent investigations have revealed
26 higher concentrations of PCE in groundwater up to 1,280 micrograms per liter ($\mu\text{g/l}$) in samples
27 collected near the City of Santa Clara sewers with lower concentrations found at and near the
28 area of the former Moonlite Cleaners. As explained during a September 27, 2011 meeting with

1 the Regional Board, the presence of higher concentrations of PCE at distances farther from the
2 dry cleaner than found near the dry cleaner can only reasonably be explained as having originated
3 from releases from the sewer system. In addition, the recent investigations identified the co-
4 presence of Methylene Blue Active Substances (MBAS) and PCE in groundwater. MBAS
5 measures components of synthetic detergents, which are not naturally-occurring and can only
6 reasonably be present in groundwater due to leakage of wastewater containing detergents.
7 Further, during the July 2011 closed circuit television inspection (CCTV) of the sewer pipeline,
8 the City of Santa Clara's sewer system was observed to be currently discharging wastewater
9 where it "probably will be discharged into waters of the state" (Attwater, 1992).

10 Moonlite believes the information is conclusive and adequate to support naming the City
11 of Santa Clara as a discharger pursuant to the SWRCB memorandum on the "Responsibility of
12 Operators of Publicly Owned and Operated Sewer Systems for Discharges from their Systems
13 which Pollute Ground Water" (Attwater, 1992). As summarized by the SWRCB, "it must be
14 concluded that the owner or operator of a [publicly owned treatment works] is responsible for
15 discharges from the sewer collection system." Based on this analysis, the SWRCB concluded to
16 the extent the release of wastes creates or threatens to create pollution or nuisance, "the public
17 agencies may be ordered to cleanup the wastes or abate the effects thereof." In addition, as the
18 operator of the sewer system, the City of Santa Clara has been in possession of the land where
19 the discharges occurred, had knowledge of the operation of its sewer system and had the legal
20 authority (and responsibility) to prevent such discharges. For these foregoing reasons, the City of
21 Santa Clara should be required as a discharger to address the release of PCE from its sewers.

22 **GROUNDS FOR PETITION**

23 The Regional Board has failed to name appropriate parties in response to a request by
24 Moonlite. This failure to act by the Regional Board is inconsistent with the policies of the State
25 Board. State Water Resources Control Board Resolution No. 92-49, (attached hereto as Exhibit
26 "C"), requires that the Regional Boards "make a reasonable effort to identify the discharges" and
27 "[w]here necessary to protect water quality, name other persons as dischargers." [Res. No. 92-
28 49(I)(B)&(II)(A)(4).] Specifically, Resolution 92-49 states that the Regional Board shall use any

1 relevant evidence including: (“[i]ndustry-wide operational practices that historically have led to
2 discharges, such as leakage of pollutants from wastewater collection and conveyance systems...”
3 [Res. No. 92-49 (I)(A)(4).]

4 In December 1992, Chief Counsel for the State Board elaborated upon this policy in a
5 memorandum to Regional Board Executive Officers entitled, “Responsible Party Orders,”
6 (attached hereto as Exhibit “D”). In this memorandum, Chief Counsel William Attwater, states
7 that Regional Boards should “name all persons who have caused or permitted a discharge,”
8 including “both active discharges and continuing discharges”. It further states that Regional
9 Boards should name prior landowners and government parties. This policy was designed to
10 promote the objective of ensuring adequate funding and resources to effectuate the remediation
11 of environmental contamination.

12 In an Executive Officers Report dated July 1, 2009, John Wolfenden reported on the Dry
13 Cleaner workshop in pertinent part as follows:

14 Responsible party funding: The responsible party is required to pay for
15 the investigation and cleanup of the site. However, because the responsible
16 parties for dry cleaners are often mom-and-pop small businesses, their sources
17 of funding are often quite limited. In certain cases, cities have been named as
18 responsible parties and required to complete cleanup of PCE that leaked from
19 city sewer lines. But in order for a city to be named as a responsible party, one
20 of two things usually needs to be demonstrated: 1) a lack of city maintenance
21 on the sewer line, or 2) a city well has acted as a conduit for pollution to
22 migrate to deeper aquifers.

19 The work conducted at the Site by Moonlite has demonstrated that there has
20 been a lack of city maintenance on the sewer line in the vicinity of the Moonlite
21 Shopping Center and that such a lack of maintenance has resulted in releases of PCE
22 to the environment from the sewer system. Despite this evidence, the Regional Board
23 has not taken action to include the City as a discharger.

24 Here, the Regional Board has failed to name parties as responsible parties in Water Code
25 Section 13267 letters it has issued to Moonlite, although there is substantial evidence and
26 grounds to name them. This decision by the Regional Board directly contradicts State Board
27 policy and impedes the objectives of the State Board, namely to “achieve a unified and effective
28 water quality control program in the state.” [Res. No. 92-49(1).]

1 Specifically, Petitioner challenges the Regional Board's failure to act in response to
2 Moonlite's letter dated October 24, 2011 requesting that the City of Santa Clara and United
3 Artists be included as responsible parties.

4 Although the Regional Board indicated to counsel for Moonlite on November 18, 2011
5 that a Water Code Section 13267 letter requesting the site history was to be issued to the City of
6 Santa Clara and United Artists, the Regional Board then sent an email to counsel stating that
7 "management will require that the soil gas is delineated laterally in the [Moonlite] shopping
8 center before writing the site history letters." (See email from Nathan King dated November 18,
9 2011, attached hereto as Exhibit "B"). Further lateral delineation has not been required by the
10 Regional Board, the soil gas at the site is already adequately defined laterally, and it is
11 inappropriate for the Regional Board to fail to act to include the City and United Artists based on
12 this unnecessary "requirement."

13 **1. The Regional Board Failed to Name the City of Santa Clara in the Water Code**
14 **§13267 Letters**

15 The City of Santa Clara owns the sanitary sewer, which receives discharges from the
16 Property, and also owns the sanitary sewer easement located along the southern boundary of the
17 Property. Because of the City's exclusive control of the sanitary sewer and its failure to prevent
18 the release of contaminants from its sewers to soil and groundwater, the City of Santa Clara
19 should be named as a discharger by the Regional Board. The Regional Board has declined to
20 name the City.

21 The State Board has found that it is appropriate to name public agencies as primarily
22 liable in a Cleanup and Abatement Order. [State Board Order No. WQ 89-12 at 12.] Similarly,
23 other Regional Boards have named a sewer operator even when other parties are available to
24 perform such cleanups. [Central Valley Regional Water Board, Cleanup and Abatement Order.
25 No. R5-2004-0043 (City of Lodi).] The basis for naming Lodi was that the City "as owner and
26 operator of a waste disposal conveyance system the City has caused or permitted waste to be
27 discharged . . . [Further] [t]he City has had actual or constructive (legally presumed) knowledge
28 of discharges from its sewers, and the ability to prevent further sewer discharges . . ." [Order No.

1 R5-2004-0043 at 1].

2 1. Significant Evidence of the City's Responsibility

3 For nearly 20 years, Regional Boards have recognized operations of sewers as a major
4 source of groundwater contamination via leakage from sanitary sewer lines. In 1992, the Central
5 Valley Regional Board, produced a report detailing how PCE from dry-cleaners enters the
6 groundwater via leaks from sewers (attached hereto as Exhibit "E"). This report concluded, "the
7 majority of dry cleaners had only one discharge point and that was to the sewer." [Ex. "Q" at 10].
8 This PCE leakage is believed to occur a number of ways including through joints and cracks in
9 the sewer line. [Exhibit E at 19]. The report concluded that "leakage through sewers is the major
10 avenue through which PCE is introduced to the subsurface" resulting in groundwater
11 contamination from dry cleaners [Exhibit E at 2].

12 Moonlite has presented extensive data for the Site that show that the City's sewers have
13 leaked PCE, as well as other chemicals to groundwater, e.g. uncapped laterals, presence of
14 surfactants in groundwater. To compound matters, despite being on notice of their potential
15 contributions for more than a year, the City has not undertaken any efforts to investigate or
16 address the conditions.

17 2. It is State Board Policy that Landowners be Named

18 The State Water Resources Control Board adopted Resolution 92-49 under California
19 Water Code Section 13307. Resolution 92-49 established the procedures the Regional Boards
20 "will follow in making decisions when a person may be required" to investigate and/or abate an
21 unauthorized release. [Res. No. 92-49(5).] State Board policy states "A long line of State Board
22 orders have upheld Regional Board orders holding landowners responsible for cleanup of
23 pollution on their property regardless of their involvement in the activities that initially caused
24 the pollution." [Order No. WQ 89-8.] Petitioner has presented evidence that contamination
25 occurred while United Artists was the owner of the Property and as such, the Regional Board's
26 failure to act is improper.

27 The State Board "has consistently taken the position that a landowner who has knowledge
28 of the activity taking place and has the ability to control the activity, has 'permitted' the

1 discharge within the meaning of Section 13304.” [Order No. WQ 89-12.] United Artists had both
2 knowledge of the activity on the Property and also had the ability, as owner, to control that
3 activity.

4 In Order No. WQ 89-12, one of the significant factors in the decision to hold the
5 landowners responsible was that the property owner has the right under the lease to enter and
6 inspect the premises. Similarly, United Artist as Lessor and Master Lessor would have had the
7 ability under a lease to enter and inspect the Property.

8 Moonlite, like United Artists, never owned or operated a dry-cleaning facility at the
9 Property. Moonlite, like United Artists, owned the Property for approximately 18 years when a
10 dry-cleaning facility operated at the Site. Moonlite, unlike United Artists, however, has been
11 required by the Regional Board to perform work pursuant to Water Code Section 13267. There is
12 no reason why United Artists has not been required to do work or named as a
13 discharger/responsible party, except for the fact that the Regional Board has failed to act upon
14 appropriate information and requests made by Moonlite to include United Artists.

15 **CONCLUSION**

16 For all the reasons stated herein, Petitioner requests that the State Board include as
17 Responsible Parties, the City of Santa Clara and United Artists. Petitioner requests the State
18 Board to hold in abeyance this Petition for Review and request for hearing pending the Regional
19 Board hearing requested by Petitioner.

20 Dated: December 15, 2011

Respectfully submitted,

22 GUALCO LAW

24 By: 

LORI J. GUALCO
Attorney for Petitioner
Moonlite Associates LLC

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PROOF OF SERVICE

I am a resident of the State of California, over the age of eighteen years, and not a party to the within action. My business address is Gualco Law, 400 Capitol Mall, Eleventh Floor, Sacramento, CA 95814. On December 15, 2011, I served the within documents:

PETITION FOR REVIEW OF REGIONAL WATER QUALITY CONTROL BOARD LACK OF ACTION; REQUEST TO HOLD PETITION IN ABEYANCE

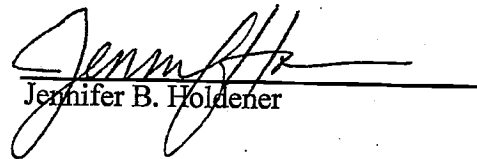
By United States Mail. I enclosed the documents in a sealed envelope or package addressed to the persons at the addresses listed below by placing the envelope for collection and mailing, following our ordinary business practices. I am readily familiar with this business's practice for collecting and processing correspondence for mailing. On the same day that correspondence is placed for collection and mailing, it is deposited in the ordinary course of business with the United States Postal Service, in a sealed envelope with postage fully prepared. I am a resident or employed in the county where the mailing occurred. The envelope or package was placed in the mail at Sacramento, California.

By Fax Transmission. Based on an agreement of the parties to accept service by fax transmission, I faxed the documents to the persons at the fax numbers listed below. No error was reported by the fax machine that I used.

By Overnight Delivery. I enclosed the documents in an envelope or package provided by an overnight delivery carrier and addressed to the persons at the addresses listed below. I placed the envelope or package for collection and overnight delivery at an office or a regularly utilized drop box of the overnight delivery carrier.

Thomas Howard
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

I declare under penalty of perjury under the laws of the State of California that the above is true and correct. Executed December 15, 2011, at Auburn, California.


Jennifer B. Holdener

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PROOF OF SERVICE

I am a resident of the State of California, over the age of eighteen years, and not a party to the within action. My business address is Gualco Law, 400 Capitol Mall, Eleventh Floor, Sacramento, CA 95814. On December 15, 2011, I served the within documents:

**PETITION FOR REVIEW OF REGIONAL WATER QUALITY CONTROL BOARD
LACK OF ACTION; REQUEST TO HOLD PETITION IN ABEYANCE**

By United States Mail. I enclosed the documents in a sealed envelope or package addressed to the persons at the addresses listed below by placing the envelope for collection and mailing, following our ordinary business practices. I am readily familiar with this business's practice for collecting and processing correspondence for mailing. On the same day that correspondence is placed for collection and mailing, it is deposited in the ordinary course of business with the United States Postal Service, in a sealed envelope with postage fully prepared. I am a resident or employed in the county where the mailing occurred. The envelope or package was placed in the mail at Sacramento, California.

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By Overnight Delivery. I enclosed the documents in an envelope or package provided by an overnight delivery carrier and addressed to the persons at the addresses listed below. I placed the envelope or package for collection and overnight delivery at an office or a regularly utilized drop box of the overnight delivery carrier.

Bruce H. Wolfe
Executive Officer
California Regional Water Quality
Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Michael C. Serverian
Rankin, Landsness, Lahde, Serverian & Stock
96 North 3rd Street, Suite 500
San Jose, CA 95112

Julia A. Hill
Office of the City Attorney
1500 Warburton Avenue
Santa Clara, CA 95050

Rodger Hayton
George Hills Company, Inc.
2875 Moorpark, Suite 130
San Jose, CA 95128

Scott H. Reisch
Hogan Lovells US LLP
One Tabor Center
1200 17th Street, Suite 1500
Denver, CO 80202

I declare under penalty of perjury under the laws of the State of California that the above is true and correct. Executed December 15, 2011, at Auburn, California.

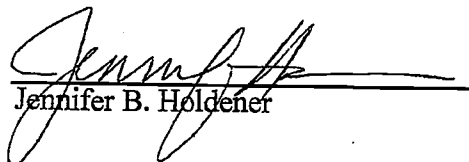

Jennifer B. Holdener

EXHIBIT A

FRANK LAW GROUP, P.C.

David E. Frank

Gregory W. Koonce
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Of Counsel:
Lori J. Gualco
Darren P. Trone, P.C.

October 24, 2011

VIA EMAIL

Nathan King, P.G.
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, 14th Floor
Oakland, CA 94612

Re: Former Moonlite Cleaners, 2640 El Camino, Santa Clara, California

Dear Mr. King,

Pursuant to our meeting on September 27, 2011, I am writing on behalf of my client, Moonlite Associates, LLC, to request that the California Regional Water Quality Control Board – San Francisco Bay Region (Regional Board) include United Artists as a discharger and require it to conduct investigation and remediation of the releases of tetrachloroethene (PCE) at and near the Moonlite Shopping Center located at 2610 to 2798 El Camino Real in Santa Clara, California (“the Site”). In addition, I request that the Regional Board pursue obtaining the additional information and data it believes is necessary to support including the City of Santa Clara as a discharger for releases from its sewer system that have impacted my client’s property.

United Artists

In March 2011, my office, on behalf of Moonlite Associates, the current property owner, forwarded extensive documentation regarding United Artists’ development and ownership of the subject property. As presented in the documents provided to the Regional Board, United Artists (formerly United California Theaters) developed the Moonlite Shopping Center in 1961. United Artists (as United Artists Theatre Circuit, Inc.) continued to own and operate the Moonlite Shopping Center until 1975. In 1975, United Artists sold the Moonlite Shopping Center, but continued as the Master Lessor until 1978, including subleasing tenant space to Moonlite Cleaners until 1978.

The former Moonlite Cleaners operated at the Site between 1961 and 1996. United Artists owned, controlled and/or operated the Moonlite Shopping Center with the dry cleaner as a tenant for 17 of those years, half the time of operation and when less sophisticated equipment and practices were used by operators. United Artists leased the tenant space to Moonlite Cleaners and had control over the tenants' operations from 1961 to 1978. In addition, United Artists through its lease agreement had knowledge of the activities that resulted in releases of PCE and had the authority to prevent such activities by the dry cleaners during this period.

Recent environmental investigations conducted at the Site have shown that the dry cleaner solvent PCE was released to soil, soil gas and groundwater beneath the Site during the period United Artists owned and managed the property, e.g., contamination at depth when groundwater elevations were lower. In addition, the distribution of PCE in the subsurface has been correlated to releases when flow directions were controlled by the lower groundwater elevations during the 1960s and 1970s.

In accordance with the State Water Resources Control Board (SWRCB) Policy on Naming Dischargers (Attwater, 1992), "prior landowners and lessees should be named if they owned or were in possession of the site at the time of discharge, had knowledge of the activities which resulted in the discharge, and had the legal authority to prevent the discharge (numerous orders, including WQ 85-7, 86-15, 91-7 and 92-13)." Based on the foregoing, we are requesting that United Artists be included as a named discharger for releases of PCE at the Moonlite Shopping Center and be required to investigate and remediate the contamination.

City of Santa Clara

Based on our discussions at the September 27, 2011 meeting, we understand that the Regional Board requires additional information before concluding the City of Santa Clara is a discharger of PCE. While we believe that the recent investigations provide definitive data showing releases have and are occurring from the City of Santa Clara wastewater collection system, the Regional Board has indicated that additional soil and/or groundwater data would support inclusion of the City of Santa Clara as a discharger of PCE that has impacted the Site.

Recent investigations have revealed higher concentrations of PCE in groundwater up to 1,280 micrograms per liter ($\mu\text{g/l}$) in samples collected near the City of Santa Clara sewers with lower concentrations found at and near the area of the former Moonlite Cleaners. As explained during our meeting, the presence of higher concentrations of PCE at distances farther from the dry cleaner than found near the dry cleaner can only reasonably be explained as having originated from releases from the sewer system. In addition, the recent investigations identified the co-presence of Methylene Blue Active Substances (MBAS) and PCE in groundwater. MBAS measures components of synthetic detergents, which are not naturally-occurring and can only reasonably be present in groundwater due to leakage of wastewater containing detergents. Further, during the July 2011 closed circuit television inspection (CCTV) of the sewer pipeline, the City of Santa Clara's sewer system was

Nathan King, P.G.
October 24, 2011
Page 3 of 3

observed to be currently discharging wastewater where it "probably will be discharged into waters of the state (Attwater, 1992)."

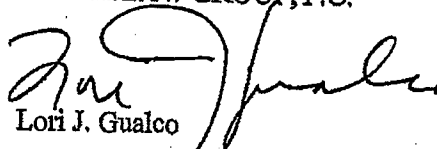
Moonlite Associates believes the information is conclusive and adequate to support naming the City of Santa Clara as a discharger pursuant to the SWRCB memorandum on the "Responsibility of Operators of Publicly Owned and Operated Sewer Systems for Discharges from their Systems which Pollute Ground Water" (Attwater, 1992). As summarized by the SWRCB, "it must be concluded that the owner or operator of a [publicly owned treatment works] is responsible for discharges from the sewer collection system." Based on this analysis, the SWRCB concluded to the extent the release of wastes creates or threatens to create pollution or nuisance, "the public agencies may be ordered to cleanup the wastes or abate the effects thereof." In addition, as the operator of the sewer system the City of Santa Clara has been in possession of the land where the discharges occurred, had knowledge of the operation of its sewer system and had the legal authority (and responsibility) to prevent such discharges. For these foregoing reasons, the City of Santa Clara should be required as a discharger to address the release of PCE from its sewers.

During our meeting, the Regional Board indicated that soil and/or groundwater data from samples collected from beneath or immediately adjacent to the sewer pipes would aid in its evaluations of the contributions from the City of Santa Clara. Therefore, to the extent that the Regional Board believes such data are necessary, we are requesting it take appropriate action to request the City of Santa Clara to obtain the requisite additional information regarding discharges of PCE near its sewer lines in the vicinity of the Moonlite Shopping Center.

If you have any questions, please contact me.

Very truly yours,

FRANK LAW GROUP, P.C.


Lori J. Gualco

LJG/slh

cc: Client

John Wolfenden, Regional Board
Scott H. Reish, Hogan Lovells US LLP, Attorneys for United Artists,
Julia Hill, Assistant City Attorney
Michael C. Severian, Esq., Rankin, Landsness

EXHIBIT B

From: Nathan King
To: "Lori J. Gualco"
Subject: Moonlite Cleaners
Date: Friday, November 18, 2011 9:07:16 AM

Lori-

I failed to mention that management will require that the soil gas is delineated laterally in the shopping center before writing the site history letters. I believe this is already a requirement from us. Let me know how you would like to proceed.

Thanks,

Nathan King, P.G.
California Regional Water
Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
Tel. (510) 622-3966

EXHIBIT C

Resolution No. 92-49

STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 92-49

(As Amended on April 21, 1994 and October 2, 1996)

POLICIES AND PROCEDURES FOR INVESTIGATION AND CLEANUP AND ABATEMENT OF DISCHARGES UNDER WATER CODE SECTION 13304

WHEREAS:

1. California Water Code (WC) Section 13001 provides that it is the intent of the Legislature that the State Water Resources Control Board (State Water Board) and each Regional Water Quality Control Board (Regional Water Board) shall be the principal state agencies with primary responsibility for the coordination and control of water quality. The State and Regional Water Boards shall conform to and implement the policies of the Porter-Cologne Water Quality Control Act (Division 7, commencing with WC Section 13000) and shall coordinate their respective activities so as to achieve a unified and effective water quality control program in the state;
2. WC Section 13140 provides that the State Water Board shall formulate and adopt State Policy for Water Quality Control;
3. WC Section 13240 provides that Water Quality Control Plans shall conform to any State Policy for Water Quality Control;
4. WC Section 13304 requires that any person who has discharged or discharges waste into waters of the state in violation of any waste discharge requirement or other order or prohibition issued by a Regional Water Board or the State Water Board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance may be required to clean up the discharge and abate the effects thereof. This section authorizes Regional Water Boards to require complete cleanup of all waste discharged and restoration of affected water to background conditions (i.e., the water quality that existed before the discharge). The term waste discharge requirements includes those which implement the National Pollutant Discharge Elimination System;
5. WC Section 13307 provides that the State Water Board shall establish policies and procedures that its representatives and the representatives of the Regional Water Boards shall follow for the oversight of investigations and cleanup and abatement activities resulting from discharges of hazardous substances, including:
 - a. The procedures the State Water Board and the Regional Water Boards will follow in making decisions as to when a person may be required to undertake an investigation to determine if an unauthorized hazardous substance discharge has occurred;
 - b. Policies for carrying out a phased, step-by-step investigation to determine the nature and extent of possible soil and ground water contamination or pollution at a site;
 - c. Procedures for identifying and utilizing the most cost-effective methods for detecting contamination or pollution and cleaning up or abating the effects of contamination or pollution;
 - d. Policies for determining reasonable schedules for investigation and cleanup, abatement, or other remedial action at a site. The policies shall recognize the danger to public health and the waters of the state posed by an unauthorized discharge and the need to mitigate those dangers while at the same time taking into account, to the extent possible, the resources, both financial and technical, available to the person responsible for the discharge;

6. "Waters of the state" include both ground water and surface water;
7. Regardless of the type of discharge, procedures and policies applicable to investigations, and cleanup and abatement activities are similar. It is in the best interest of the people of the state for the State Water Board to provide consistent guidance for Regional Water Boards to apply to investigation, and cleanup and abatement;
8. WC Section 13260 requires any person discharging or proposing to discharge waste that could affect waters of the state, or proposing to change the character, location, or volume of a discharge to file a report with and receive requirements from the Regional Water Board;
9. WC Section 13267 provides that the Regional Water Board may require dischargers, past dischargers, or suspected dischargers to furnish those technical or monitoring reports as the Regional Water Board may specify, provided that the burden, including costs, of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports;
10. WC Section 13300 states that the Regional Water Board may require a discharger to submit a time schedule of specific actions the discharger shall take in order to correct or prevent a violation of requirements prescribed by the Regional Water Board or the State Water Board;
11. California Health and Safety Code (HSC) Section 25356.1 requires the Department of Toxic Substances Control (DTSC) or, if appropriate, the Regional Water Board to prepare or approve remedial action plans for sites where hazardous substances were released to the environment if the sites have been listed pursuant to HSC Section 25356 (state "Superfund" priority list for cleanup of sites);
12. Coordination with the U.S. Environmental Protection Agency (USEPA), state agencies within the California Environmental Protection Agency (Cal/EPA) (e.g., DTSC, Air Resources Control Board), air pollution control districts, local environmental health agencies, and other responsible federal, state, and local agencies: (1) promotes effective protection of water quality, human health, and the environment and (2) is in the best interest of the people of the state. The principles of coordination are embodied in many statutes, regulations, and interagency memoranda of understanding (MOU) or agreement which affect the State and Regional Water Boards and these agencies;
13. In order to clean up and abate the effects of a discharge or threat of a discharge, a discharger may be required to perform an investigation to define the nature and extent of the discharge or threatened discharge and to develop appropriate cleanup and abatement measures;
14. Investigations that were not properly planned have resulted in increases in overall costs and, in some cases, environmental damage. Overall costs have increased when original corrective actions were later found to have had no positive effect or to have exacerbated the pollution. Environmental damage may increase when a poorly conceived investigation or cleanup and abatement program allows pollutants to spread to previously unaffected waters of the state;
15. A phased approach to site investigation should facilitate adequate delineation of the nature and extent of the pollution, and may reduce overall costs and environmental damage, because: (1) investigations inherently build on information previously gained; (2) often data are dependent on seasonal and other temporal variations; and (3) adverse consequences of greater cost or increased environmental damage can result from improperly planned investigations and the lack of consultation and coordination with the Regional Water Board. However, there are circumstances under which a phased, iterative approach may not be necessary to protect water quality, and there are other circumstances under which phases may need to be compressed or combined to expedite cleanup and abatement;
16. Preparation of written workplans prior to initiation of significant elements or phases of investigation, and cleanup and abatement generally saves Regional Water Board and discharger resources. Results are superior, and the overall cost-effectiveness is enhanced;
17. Discharger reliance on qualified professionals promotes proper planning, implementation, and long-term cost-effectiveness of investigation, and cleanup and abatement activities. Professionals should be qualified, licensed where applicable, and competent and proficient in the fields pertinent to the required activities.

California Business and Professions Code Sections 6735, 7835, and 7835.1 require that engineering and geologic evaluations and judgements be performed by or under the direction of registered professionals;

18. WC Section 13360 prohibits the Regional Water Boards from specifying, but not from suggesting, methods that a discharger may use to achieve compliance with requirements or orders. It is the responsibility of the discharger to propose methods for Regional Water Board review and concurrence to achieve compliance with requirements or orders;

19. The USEPA, California state agencies, the American Society for Testing and Materials, and similar organizations have developed or identified methods successful in particular applications. Reliance on established, appropriate methods can reduce costs of investigation, and cleanup and abatement;

20. The basis for Regional Water Board decisions regarding investigation, and cleanup and abatement includes: (1) site-specific characteristics; (2) applicable state and federal statutes and regulations; (3) applicable water quality control plans adopted by the State Water Board and Regional Water Boards, including beneficial uses, water quality objectives, and implementation plans; (4) State Water Board and Regional Water Board policies, including State Water Board Resolutions No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California) and No. 88-63 (Sources of Drinking Water); and (5) relevant standards, criteria, and advisories adopted by other state and federal agencies;

21. Discharges subject to WC Section 13304 may include discharges of waste to land; such discharges may cause, or threaten to cause, conditions of soil or water pollution or nuisance that are analogous to conditions associated with migration of waste or fluid from a waste management unit;

22. The State Water Board has adopted regulations governing discharges of waste to land (California Code of Regulations (CCR), Title 23, Division 3, Chapter 15);

23. State Water Board regulations governing site investigation and corrective action at underground storage tank unauthorized release sites are found in 23 CCR Division 3, Chapter 16, in particular Article 11 commencing with Section 2720;

24. It is the responsibility of the Regional Water Board to make decisions regarding cleanup and abatement goals and objectives for the protection of water quality and the beneficial uses of waters of the state within each Region;

25. Cleanup and abatement alternatives that entail discharge of residual wastes to waters of the state, discharges to regulated waste management units, or leaving wastes in place, create additional regulatory constraints and long-term liability, which must be considered in any evaluation of cost-effectiveness;

26. It is not the intent of the State or Regional Water Boards to allow dischargers, whose actions have caused, permitted, or threaten to cause or permit conditions of pollution, to avoid responsibilities for cleanup. However, in some cases, attainment of applicable water quality objectives for ground water cannot reasonably be achieved. In these cases, the State Water Board determines that establishment of a containment zone is appropriate and consistent with the maximum benefit to the people of the State if applicable requirements contained in the Policy are satisfied. The establishment of a containment zone does not limit or supersede obligations or liabilities that may arise under other laws;

27. The Porter-Cologne Water Quality Control Act allows Regional Water Boards to impose more stringent requirements on discharges of waste than any statewide requirements promulgated by the State Water Board (e.g., in this Policy) or than water quality objectives established in statewide or regional water quality control plans as needed to protect water quality and to reflect regional and site-specific conditions; and

28. Pursuant to Section 13320 of the Water Code, aggrieved persons may petition the State Water Board to review any decisions made under this policy.

THEREFORE BE IT RESOLVED:

These policies and procedures apply to all investigations, and cleanup and abatement activities, for all types of discharges subject to Section 13304 of the WC.

I. The Regional Water Board shall apply the following procedures in determining whether a person shall be required to investigate a discharge under WC Section 13267, or to clean up waste and abate the effects of a discharge or a threat of a discharge under WC Section 13304. The Regional Water Board shall:

A. Use any relevant evidence, whether direct or circumstantial, including, but not limited to, evidence in the following categories:

1. Documentation of historical or current activities, waste characteristics, chemical use, storage or disposal information, as documented by public records, responses to questionnaires, or other sources of information;
2. Site characteristics and location in relation to other potential sources of a discharge;
3. Hydrologic and hydrogeologic information, such as differences in upgradient and downgradient water quality;
4. Industry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills, and clarifiers;
5. Evidence of poor management of materials or wastes, such as improper storage practices or inability to reconcile inventories;
6. Lack of documentation of responsible management of materials or wastes, such as lack of manifests or lack of documentation of proper disposal;
7. Physical evidence, such as analytical data, soil or pavement staining, distressed vegetation, or unusual odor or appearance;
8. Reports and complaints;
9. Other agencies' records of possible or known discharge; and
10. Refusal or failure to respond to Regional Water Board inquiries;

B. Make a reasonable effort to identify the dischargers associated with the discharge. It is not necessary to identify all dischargers for the Regional Water Board to proceed with requirements for a discharger to investigate and clean up;

C. Require one or more persons identified as a discharger associated with a discharge or threatened discharge subject to WC Section 13304 to undertake an investigation, based on findings of I.A and I.B above;

D. Notify appropriate federal, state, and local agencies regarding discharges subject to WC Section 13304 and coordinate with these agencies on investigation, and cleanup and abatement activities.

II. The Regional Water Board shall apply the following policies in overseeing: (a) investigations to determine the nature and horizontal and vertical extent of a discharge and (b) appropriate cleanup and abatement measures.

A. The Regional Water Board shall:

1. Require the discharger to conduct investigation, and cleanup and abatement, in a progressive sequence ordinarily consisting of the following phases, provided that the sequence shall be adjusted to accommodate site-specific circumstances, if necessary:
 - a. Preliminary site assessment (to confirm the discharge and the identity of the dischargers; to identify affected or threatened waters of the state and their beneficial uses; and to develop preliminary information on the nature, and vertical and horizontal extent, of the discharge);
 - b. Soil and water Investigation (to determine the source, nature and extent of the discharge with sufficient detail to provide the basis for decisions regarding subsequent cleanup and abatement actions, if any are determined by the Regional Water Board to be necessary);

c. Proposal and selection of cleanup and abatement action (to evaluate feasible and effective cleanup and abatement actions, and to develop preferred cleanup and abatement alternatives);

d. Implementation of cleanup and abatement action (to implement the selected alternative, and to monitor in order to verify progress);

e. Monitoring (to confirm short- and long-term effectiveness of cleanup and abatement);

2. Consider, where necessary to protect water quality, approval of plans for investigation, or cleanup and abatement, that proceed concurrently rather than sequentially, provided that overall cleanup and abatement goals and objectives are not compromised, under the following conditions:

a. Emergency situations involving acute pollution or contamination affecting present uses of waters of the state;

b. Imminent threat of pollution;

c. Protracted investigations resulting in unreasonable delay of cleanup and abatement; or

d. Discharges of limited extent which can be effectively investigated and cleaned up within a short time;

3. Require the discharger to extend the investigation, and cleanup and abatement, to any location affected by the discharge or threatened discharge;

4. Where necessary to protect water quality, name other persons as dischargers, to the extent permitted by law;

5. Require the discharger to submit written workplans for elements and phases of the investigation, and cleanup and abatement, whenever practicable;

6. Review and concur with adequate workplans prior to initiation of investigations, to the extent practicable. The Regional Water Board may give verbal concurrence for investigations to proceed, with written follow-up. An adequate workplan should include or reference, at least, a comprehensive description of proposed investigative, cleanup, and abatement activities, a sampling and analysis plan, a quality assurance project plan, a health and safety plan, and a commitment to implement the workplan;

7. Require the discharger to submit reports on results of all phases of investigations, and cleanup and abatement actions, regardless of degree of oversight by the Regional Water Board;

8. Require the discharger to provide documentation that plans and reports are prepared by professionals qualified to prepare such reports, and that each component of investigative and cleanup and abatement actions is conducted under the direction of appropriately qualified professionals. A statement of qualifications of the responsible lead professionals shall be included in all plans and reports submitted by the discharger;

9. Prescribe cleanup levels which are consistent with appropriate levels set by the Regional Water Board for analogous discharges that involve similar wastes, site characteristics, and water quality considerations;

B. The Regional Water Board may identify investigative and cleanup and abatement activities that the discharger could undertake without Regional Water Board oversight, provided that these investigations and cleanup and abatement activities shall be consistent with the policies and procedures established

herein.

III. The Regional Water Board shall implement the following procedures to ensure that dischargers shall have the opportunity to select cost-effective methods for detecting discharges or threatened discharges and methods for cleaning up or abating the effects thereof. The Regional Water Board shall:

A. Concur with any investigative and cleanup and abatement proposal which the discharger demonstrates and the Regional Water Board finds to have a substantial likelihood to achieve compliance, within a reasonable time frame, with cleanup goals and objectives that implement the applicable Water Quality Control Plans and Policies adopted by the State Water Board and Regional Water Boards, and which implement permanent cleanup and abatement solutions which do not require ongoing maintenance, wherever feasible;

B. Consider whether the burden, including costs, of reports required of the discharger during the investigation and cleanup and abatement of a discharge bears a reasonable relationship to the need for the reports and the benefits to be obtained from the reports;

C. Require the discharger to consider the effectiveness, feasibility, and relative costs of applicable alternative methods for investigation, and cleanup and abatement. Such comparison may rely on previous analysis of analogous sites, and shall include supporting rationale for the selected methods;

D. Ensure that the discharger is aware of and considers techniques which provide a cost-effective basis for initial assessment of a discharge.

1. The following techniques may be applicable:

a. Use of available current and historical photographs and site records to focus investigative activities on locations and wastes or materials handled at the site;

b. Soil gas surveys;

c. Shallow geophysical surveys;

d. Remote sensing techniques;

2. The above techniques are in addition to the standard site assessment techniques, which include:

a. Inventory and sampling and analysis of materials or wastes;

b. Sampling and analysis of surface water;

c. Sampling and analysis of sediment and aquatic biota;

d. Sampling and analysis of ground water;

e. Sampling and analysis of soil and soil pore moisture;

f. Hydrogeologic investigation;

E. Ensure that the discharger is aware of and considers the following cleanup and abatement methods or combinations thereof, to the extent that they may be applicable to the discharge or threat thereof:

1. Source removal and/or isolation;

2. In-place treatment of soil or water:

a. Bioremediation;

b. Aeration;

c. Fixation;

3. Excavation or extraction of soil, water, or gas for on-site or off-site treatment by the following techniques:

- a. Bioremediation;
- b. Thermal destruction;
- c. Aeration;
- d. Sorption;
- e. Precipitation, flocculation, and sedimentation;
- f. Filtration;
- g. Fixation;
- h. Evaporation;

4. Excavation or extraction of soil, water, or gas for appropriate recycling, re-use, or disposal;

F. Require actions for cleanup and abatement to:

1. Conform to the provisions of Resolution No. 68-16 of the State Water Board, and the Water Quality Control Plans of the State and Regional Water Boards, provided that under no circumstances shall these provisions be interpreted to require cleanup and abatement which achieves water quality conditions that are better than background conditions;

2. Implement the provisions of Chapter 15 that are applicable to cleanup and abatement, as follows:

a. If cleanup and abatement involves corrective action at a waste management unit regulated by waste discharge requirements issued under Chapter 15, the Regional Water Board shall implement the provisions of that chapter;

b. If cleanup and abatement involves removal of waste from the immediate place of release and discharge of the waste to land for treatment, storage, or disposal, the Regional Water Board shall regulate the discharge of the waste through waste discharge requirements issued under Chapter 15 provided that the Regional Water Board may waive waste discharge requirements under WC Section 13269 if the waiver is not against the public interest (e.g., if the discharge is for short-term treatment or storage, and if the temporary waste management unit is equipped with features that will ensure full and complete containment of the waste for the treatment or storage period); and

c. If cleanup and abatement involves actions other than removal of the waste, such as containment of waste in soil or ground water by physical or hydrological barriers to migration (natural or engineered), or in-situ treatment (e.g., chemical or thermal fixation, or bioremediation), the Regional Water Board shall apply the applicable provisions of Chapter 15, to the extent that it is technologically and economically feasible to do so; and

3. Implement the applicable provisions of Chapter 16 for investigations and cleanup and abatement of discharges of hazardous substances from underground storage tanks;

G. Ensure that dischargers are required to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible; in approving any alternative cleanup levels less stringent than background, apply Section 2550.4 of Chapter 15, or, for cleanup and abatement associated with underground storage tanks, apply Section 2725 of Chapter 16, provided that the Regional Water Board

considers the conditions set forth in Section 2550.4 of Chapter 15 in setting alternative cleanup levels pursuant to Section 2725 of Chapter 16; any such alternative cleanup level shall:

1. Be consistent with maximum benefit to the people of the state;
2. Not unreasonably affect present and anticipated beneficial use of such water; and
3. Not result in water quality less than that prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards; and

H. Consider the designation of containment zones notwithstanding any other provision of this or other policies or regulations which require cleanup to water quality objectives. A containment zone is defined as a specific portion of a water bearing unit where the Regional Water Board finds, pursuant to Section III.H. of this policy, it is unreasonable to remediate to the level that achieves water quality objectives. The discharger is required to take all actions necessary to prevent the migration of pollutants beyond the boundaries of the containment zone in concentrations which exceed water quality objectives. The discharger must verify containment with an approved monitoring program and must provide reasonable mitigation measures to compensate for any significant adverse environmental impacts attributable to the discharge. Examples of sites which may qualify for containment zone designation include, but are not limited to, sites where either strong sorption of pollutants on soils, pollutant entrapment (e.g. dense non-aqueous phase liquids [DNAPLS]), or complex geology due to heterogeneity or fractures indicate that cleanup to applicable water quality objectives cannot reasonably be achieved. In establishing a containment zone, the following procedures, conditions, and restrictions must be met:

1. The Regional Water Board shall determine whether water quality objectives can reasonably be achieved within a reasonable period by considering what is technologically and economically feasible and shall take into account environmental characteristics of the hydrogeologic unit under consideration and the degree of impact of any remaining pollutants pursuant to Section III.H.3. The Regional Water Board shall evaluate information provided by the discharger and any other information available to it:
 - a. Technological feasibility is determined by assessing available technologies, which have been shown to be effective under similar hydrogeologic conditions in reducing the concentration of the constituents of concern. Bench-scale or pilot-scale studies may be necessary to make this feasibility assessment;
 - b. Economic feasibility is an objective balancing of the incremental benefit of attaining further reductions in the concentrations of constituents of concern as compared with the incremental cost of achieving those reductions. The evaluation of economic feasibility will include consideration of current, planned, or future land use, social, and economic impacts to the surrounding community including property owners other than the discharger. Economic feasibility, in this Policy, does not refer to the discharger's ability to finance cleanup. Availability of financial resources should be considered in the establishment of reasonable compliance schedules;
 - c. The Regional Water Board may make determinations of technological or economic infeasibility after a discharger either implements a cleanup program pursuant to III.G. which cannot reasonably attain cleanup objectives, or demonstrates that it is unreasonable to cleanup to water quality objectives, and may make determinations on the basis of projection, modeling, or other analysis of site-specific data without necessarily requiring that remedial measures be first constructed or installed and operated and their performance reviewed over time unless such projection, modeling, or other analysis is insufficient or inadequate to make such determinations;
2. The following conditions shall be met for all containment zone designations:
 - a. The discharger or a group of dischargers is responsible for submitting an application for designation of a containment zone. Where the application does not have sufficient information for the Regional Water Board to make the requisite findings, the Regional Water Board shall request the discharger(s) to develop and

submit the necessary information. Information requirements are listed in the Appendix to this section;

b. Containment and storage vessels that have caused, are causing, or are likely to cause ground water degradation must be removed or repaired, or closed in accordance with applicable regulations. Floating free product must be removed to the extent practicable. If necessary, as determined by the Regional Water Board, to prevent further water quality degradation, other sources (e.g., soils, nonfloating free product) must be either removed, isolated, or managed. The significance and approach to be taken regarding these sources must be addressed in the management plan developed under H.2.d.;

c. Where reasonable, removal of pollutant mass from ground water within the containment zone may be required, if it will significantly reduce the concentration of pollutants within the containment zone, the volume of the containment zone, or the level of maintenance required for containment. The degree of removal which may be required will be determined by the Regional Water Board in the process of evaluating the proposal for designation of a containment zone. The determination of the extent of mass removal required will include consideration of the incremental cost of mass removal, the incremental benefit of mass removal, and the availability of funds to implement the provisions in the management plan for as long as water quality objectives are exceeded within the containment zone;

d. The discharger or a group of dischargers must propose and agree to implement a management plan to assess, cleanup, abate, manage, monitor, and mitigate the remaining significant human health, water quality, and environmental impacts to the satisfaction of the Regional Water Board. Impacts will be evaluated in accordance with Section III.H.3. The management plan may include management measures, such as land use controls, engineering controls, and agreements with other landowners or agreements with the landlord or lessor where the discharger is a tenant or lessee. The contents of the management plan shall be dependent upon the specific characteristics of the proposed containment zone and must include a requirement that the Regional Water Board be notified of any transfer of affected property to a new owner(s);

e. The proposed management plan must provide reasonable mitigation measures to substantially lessen or avoid any significant adverse environmental impacts attributable to the discharge. At a minimum, the plan must provide for control of pollutants within the containment zone such that water quality objectives are not exceeded outside the containment zone as a result of the discharge. The plan must also provide, if appropriate, for equivalent alternative water supplies, reimbursement for increased water treatment costs to affected users, and increased costs associated with well modifications. Additional mitigation measures may be proposed by the discharger based on the specific characteristics of the proposed containment zone. Such measures must assist in water quality improvement efforts within the ground water basin and may include participating in regional ground water monitoring, contributing to ground water basin cleanup or management programs, or contributing to research projects which are publicly accessible (i.e., not protected by patents and licenses) and aimed at developing remedial technologies that would be used in the ground water basin. Proposals for off-site cleanup projects may be considered by the Regional Water Board as a mitigation measure under the following criteria:

1. Off-site cleanup projects must be located in the same ground water basin as the proposed containment zone, and
2. Implementation of an off-site project must result in an improvement in the basin's water quality or protect the basin's water quality from pollution, and

3. Off-site projects must include source removal or other elements for which water quality benefits or water quality protection can be easily demonstrated, and

4. Off-site projects may be proposed independently by the discharger or taken from projects identified as acceptable by the Regional Water Board through a clearinghouse process, or

5. In lieu of choosing to finance a specific off-site project, the discharger may contribute moneys to the SWRCB=s Cleanup and Abatement Account (**Account**) or other funding source. Use of such contributions to the Account or other source will be limited to cleanup projects or water quality protection projects for the basin in which the containment zone is designated. Contributions are not to exceed ten percent of the savings in continued active remediation that discharger will accrue over a ten-year period due to designation of a containment zone (less any additional costs of containment zone designation during this period, e.g., additional monitoring requirements, Regional Water Board application costs, etc.). Contributions of less than ten percent must be accompanied by a detailed justification as to why a lesser contribution would provide adequate mitigation.

Except where prohibited by Federal law, Federal agencies may be required, based on specific site conditions, to implement mitigation measures;

f. The proposed management plan must include a detailed description of the proposed monitoring program, including the location and construction of monitoring points, a list of proposed monitoring parameters, a detailed description of sampling protocols, the monitoring frequency, and the reporting requirements and frequency. The monitoring points must be at or as close as reasonable to the boundary of the containment zone so as to clearly demonstrate containment such that water quality objectives outside the containment zone are not violated as the result of the discharge. Specific monitoring points must be defined on a case-by-case basis by determining what is necessary to demonstrate containment, horizontally and vertically. All technical or monitoring program requirements and requirements for access shall be designated pursuant to WC Section 13267. The monitoring program may be modified with the approval of the Regional Water Board=s Executive Officer based on an evaluation of monitoring data;

g. The management plan must include a detailed description of the method to be used by the discharger to evaluate monitoring data and a specific protocol for actions to be taken in response to evidence that water quality objectives have been exceeded outside the containment zone as a result of the migration of pollutants from within the containment zone;

3. In order for a containment zone to be designated, it shall be limited in vertical and lateral extent; as protective as reasonably possible of human health and safety and the environment; and should not result in violation of water quality objectives outside the containment zone. The following factors must be considered by the Regional Water Board in making such findings:

a. The size of a containment zone shall be no larger than necessary based on the facts of the individual designation. In no event shall the size of a containment zone or the cumulative effect of containment zones cause a substantial decline in the overall yield, storage, or transport capacity of a ground water basin;

b. Evaluation of potentially significant impacts to water quality, human health, and the environment, shall take into consideration the following, as applicable to the specific factual situation:

1. The physical and chemical characteristics of the discharge, including its potential for migration;

2. The hydrogeological characteristics of the site and surrounding land;
3. The quantity of ground water and surface water and the direction of ground water flow;
4. The proximity and withdrawal rates of ground water users;
5. The patterns of rainfall in the region and the proximity of the site to surface waters;
6. The present and probable future uses of ground water and surface water in the area;
7. The existing quality of ground water and surface water, including other sources of pollution and their cumulative impact on water quality;
8. The potential for health impacts caused by human exposure to waste constituents;
9. The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;
10. The persistence and permanence of any potential adverse effects;
11. Exposure to human or other biological receptors from the aggregate of hazardous constituents in the environment;
12. The potential for the pollutants to attenuate or degrade and the nature of the breakdown products; and
13. Potential adverse effects on approved local development plans, including plans approved by redevelopment agencies or the California Coastal Commission.

c. No provision of this Policy shall be interpreted to allow exposure levels of constituents of concern that could have a significant adverse effect on human health or the environment;

d. A containment zone shall not be designated in a critical recharge area. A critical recharge area is an artificial recharge area or an area determined by the Regional Water Board to be a critical recharge area after the consultation process required by Section III.H.9. Further, a containment zone shall not be designated if it would be inconsistent with a local ground water management plan developed pursuant to Part 2.75 of Division 6 of the WC (commencing at Section 10750) or other provisions of law or court order, judgment or decree;

4. After designation, no further action to reduce pollutant levels, beyond that which is specified in the management plan, will be required within a containment zone unless the Regional Water Board finds that the discharger(s) has failed to fully implement the required management plan or that violation of water quality objectives has occurred beyond the containment zone, as a result of migration of chemicals from inside the containment zone. If the required tasks contained in the approved management plan are not implemented, or appropriate access is not granted by the discharger to the Regional Water Board for purposes of compliance inspection, or violation of water quality objectives occurs outside the containment zone and that violation is attributable to the discharge in the containment zone, the Regional Water Board, after 45 days public notice, shall promptly revoke the zone's containment status and shall take appropriate enforcement action against the discharger;

5. The designation of a containment zone shall be accomplished through the adoption of a cleanup and abatement order as authorized by WC Section 13304. The Regional Water Board shall make a finding of fact with regard to each of the conditions which serve as a prerequisite for containment zone designation in the cleanup and abatement order. All applicable criteria of Section III.H. must be met as a prerequisite to designation. The Regional Water Board may reject an application for designation of a containment zone for failure to meet any applicable criteria without having to make findings with regard to each prerequisite. Such orders shall be adopted by the Regional Water Boards themselves and not issued by the Executive Officers of the Regional Water Boards. These orders shall ensure compliance with all procedures, conditions, and restrictions set forth in Section III.H. As authorized by WC Section 13308, time schedules issued as part of the establishment of a containment zone may prescribe a civil penalty which shall become due if compliance is not achieved in accordance with that time schedule;

6. A containment zone shall be implemented only with the written agreement of all fee interest owners of the parcel(s) of property containing the containment zone. Exceptions may be allowed by the Regional Water Board where opposition is found to be unreasonable. In such cases, the Regional Water Board may use the authority of WC Section 13267 to assure access to property overlying the containment zone;

7. Local agencies which are supervising cleanup under contract with the State Water Board or by agreement with the Regional Water Board pursuant to provisions of the Underground Storage Tank Program may propose containment zones for consideration by the Regional Water Board. The local agency will forward its files and proposal to the Regional Water Board for consideration. Regional Water Boards shall use the same procedures, processes, public notice, and criteria that are noted elsewhere in this policy. Approval of Technical Impracticability Waivers by the Department of Toxic Substances Control or the United States Environmental Protection Agency under the requirements of the Federal Resource Conservation and Recovery Act or the Comprehensive Environmental Response, Compensation, and Liability Act are deemed to be equivalent to the actions outlined in Section H. of this Policy if :

- a. the substantive provisions of Sections III.H.2.b., e., f., and g. are met;
- b. interested parties described in III.H.8.a. are included in the public participation process; and
- c. site information is forwarded from the approving agency to the Regional Water Board so that sites for which Technical Impracticability Waivers have been approved can be included in the master listings described in Section III.H.10.;

8. The Regional Water Board shall comply with the following public participation requirements, in addition to any other legal requirements for notice and public participation, prior to the designation of a containment zone:

- a. Public notice of an intention to designate a containment zone shall be provided to all known interested persons, including the owner of the affected property(s), owners and residents of properties adjacent to the containment zone, and agencies identified in Section III.H.9, at least 45 days prior to the proposed designation of a containment zone;
- b. Interested persons shall be given the opportunity to review the application, including the proposed management plan, and any other available materials and to comment on any proposed designation of a containment zone. These materials, which contain information upon which the proposed designation of a containment zone is based, must be available for review at least 45 days prior to the proposed designation of a containment zone;
- c. The proposed designation of a containment zone shall be placed on the agenda for consideration at a Regional Water Board meeting;

9. At least 45 days prior to the proposed designation of a containment zone, the Regional Water Board shall invite a technical advisory committee to review any proposed designation and shall meet as a committee at the request of any committee member. The committee or any committee member shall provide advice to the Regional Water Board as to the appropriateness of the requested designation and such designation will become part of the public record. No person or agency shall be made a member of the committee who is employed by or has a financial interest with the discharger seeking the designation. The following agencies shall be invited to participate in the advisory committee:

- a. The California Department of Toxic Substances Control;
- b. The California Department of Health Services, Drinking Water Branch;
- c. The California Department of Fish and Game;
- d. The local health authority;
- e. The local water purveyor, in the event ground water is used or planned to be used as a source of water supply;
- f. Any local ground water management agency including an appointed water master;
- g. The United States Environmental Protection Agency; and
- h. The California Coastal Commission if the site is located within the coastal zone of California.

10. The Regional Water Boards shall keep a master listing of all designated containment zones. The master listing shall describe the location and physical boundaries of the containment zone, the pollutants which exceed applicable water quality objectives, and any land use controls associated with the containment zone designation. The Regional Water Board shall forward the information on the master list to the State Water Board and to the local well permitting agency whenever a new containment zone is designated. The State Water Board will compile the lists from the Regional Water Boards into a comprehensive master list;

11. To assure consistency of application of this Policy, the State Water Board will designate a Containment Zone Review Committee@ consisting of staff from the State Water Board and each of the Regional Water Boards. This review committee shall meet quarterly for two years and review all designation actions taken. The committee shall review problems and issues and make recommendations for consistency and improved procedures. In any event the State Water Board shall review the containment zone issue not later than five years after the adoption of Section III.H. and periodically thereafter. Such review shall take place in a public proceeding;

12. In the event that a Regional Water Board finds that water quality objectives within the containment zone have been met, after public notice, the Regional Water Board will rescind the designation of the containment zone and issue a closure letter; and

13. The Regional Water Board=s cost associated with review of applications for containment zone designation will be recoverable pursuant to Section 13304 of the Water Code, provided a separate source of funding has not been provided by the discharger.

14. Designation of a containment zone shall have no impact on a Regional Water Board=s discretion to take appropriate enforcement actions except for the provisions of Section III.H.4.

IV. The Regional Water Board shall determine schedules for investigation, and cleanup and abatement, taking into account the following factors:

- A. The degree of threat or impact of the discharge on water quality and beneficial uses;

B. The obligation to achieve timely compliance with cleanup and abatement goals and objectives that implement the applicable Water Quality Control Plans and Policies adopted by the State Water Board and Regional Water Boards;

C. The financial and technical resources available to the discharger; and

D. Minimizing the likelihood of imposing a burden on the people of the state with the expense of cleanup and abatement, where feasible.

V. The State and Regional Water Boards shall develop an expedited technical conflict resolution process so when disagreements occur, a prompt appeal and resolution of the conflict is accomplished.

Appendix to Section III.H. Application for a Containment Zone Designation

The discharger is responsible for submitting an application for designation of a containment zone. Supporting information which is readily available to the Regional Water Board and which would be cumbersome or costly to reproduce can be included in the application by reference. In order to facilitate the preparation of an acceptable application, the discharger may request that the Regional Water Board provide a preliminary review of a partial application. The partial application should be detailed enough to allow the Regional Water Board to determine if the site passes the threshold criteria for establishment of a containment zone (e.g., it is not reasonable to achieve water quality objectives at that site, plume management measures are likely to be effective, etc.). As appropriate, the application shall include:

- a) Background information (location, site history, regulatory history);
- b) Site characterization information, including a description of the nature and extent of the discharge. Hydrogeologic characterization must be adequate for making the determinations necessary for a containment zone designation;
- c) An inventory of all wells (including abandoned wells and exploratory boreholes) that could affect or be affected by the containment zone;
- d) A demonstration that it is not reasonable to achieve water quality objectives;
- e) A discussion of completed source removal and identification of any additional sources that will be addressed during implementation of the management plan;
- f) A discussion of the extent to which pollutant mass has been reduced in the aquifer and identification of any additional mass removal that will be addressed during implementation of the management plan;
- g) If necessary, information related to the availability of funds to implement the provisions of the management plan throughout the expected duration of the containment zone designation;
- h) The proposed boundaries for the proposed containment zone pursuant to Section III.H.3.a.;
- i) An evaluation of potential impacts to water quality, human health and the environment pursuant to Sections III.H.3.b. and c.;
- j) A statement that the discharger believes that the site is not located in a critical recharge area, as required by Section III.H.3.d.;
- k) Copies of maps and cross sections that clearly show the boundaries of the proposed containment zone and that show the locations where land use restrictions will apply. Maps must include at least four points of reference near the map corners. Reference points must be identified by latitude and longitude (accurate to within 50 feet), as appropriate for possible inclusion in a geographic information system (GIS) database; and
- l) A management plan for review and approval. The management plan must contain provisions for:

- 1) source removal as appropriate;
- 2) pollutant mass removal from the aquifer as appropriate;
- 3) land use or engineering controls necessary to prevent the migration of pollution, including the proper abandonment of any wells within the vicinity of the containment zone that could provide a conduit for pollution migration beyond the containment zone boundary;
- 4) land use or engineering controls necessary to prevent water quality impacts and risks to human health and the environment;
- 5) mitigation measures, an implementation schedule for mitigation, and reporting requirements for compliance with mitigation measures;
- 6) a detailed description of the proposed monitoring program;
- 7) a detailed description of the method to be used by the discharger to evaluate monitoring data;
- 8) a specific protocol for actions to be taken if there is evidence that water quality objectives have been exceeded outside the containment zone as a result of the migration of pollutants from within the containment zone;
- 9) a detailed description of the frequency and content of reports to be submitted to the Regional Water Board;
- 10) detailed procedures and designs for well maintenance, replacement and decommissioning;
- 11) a protocol for submittal to and approval by the Executive Officer of minor modifications to the management plan as necessary to optimize monitoring and containment; and
- 12) a description of file and data base maintenance requirements.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on June 18, 1992, and amended at meetings of the State Water Resources Control Board held on April 21, 1994, and October 2, 1996.

Maureen Marche
Administrative Assistant to the Board

EXHIBIT D

---*---*--- Copy of Memo (Beginning) ---*---*---

State of California
M e m o r a n d u m

To: Regional Board Executive Officers **Date:** December 2, 1992

/s/

William R. Attwater
Chief Counsel

From: OFFICE OF THE CHIEF COUNSEL
STATE WATER RESOURCES CONTROL BOARD
901 P Street, Sacramento, CA 95814
Mail Code: G-8

Subject: RESPONSIBLE PARTY ORDERS

Attached is a summary of principles established in State Water Board orders regarding who should be named in ground water cleanup orders.

Attachment

cc: Walt Pettit
Executive Director

Redding, Fresno, and Victorville Branch Offices

--- END OF PAGE 1 of 2 ---

--- BEGINNING PAGE 2 OF 2 ---
STATE BOARD ORDERS: WHO SHOULD BE NAMED IN
GROUND WATER CLEANUP ORDERS

Summary of Principles

- In general, name all persons who have caused or permitted a discharge (Orders Nos. WQ 85-7 and 86-16).
- "Discharge" is to be construed broadly to include both active discharges and continuing discharges (Order No. WQ 86-2).
- There must be reasonable basis for naming a responsible party (i.e., substantial evidence). It is inappropriate to name persons who are only remotely related to the problem such as suppliers and distributors of gasoline (WQ 85-7, 86-16, 87-1, 89-13, and 90-3).
- Persons who are in current possession, ownership or control of the property should be named, including current landowners and lessees (numerous orders, including WQ 84-6, 86-11, 86-18, 89-1, 89-8, 89-13 and 90-3). Lessees/sublessors may be responsible (WQ 86-15).
- Generally, Regional Water Boards should not try to apportion responsibility between parties (WQ 86-2 and 88-2).
- However, in some cases, current landowners should only be named as secondarily liable. Factors: landowner did not cause or know of actual discharge; tenant, lessee or prior owner is responsible; cleanup is proceeding; and lease is long-term (WQ 86-11, 86-18, 87-6, and 92-13). Secondary responsibility is also appropriate where landowner is trustee-type of governmental agency such as Forest Service (WQ 87-5).
- Prior landowners and lessees should be named if they owned or were in possession of the site at the time of discharge, had knowledge of the activities which resulted in the discharge, and had the legal authority to prevent the discharge (numerous orders, including WQ 85-7, 86-15, 91-7 and 92-13). Narrow exceptions based on such factors as: site owned or leased for short time, person did not cause actual discharge, are other responsible parties, person did not use property, no or minimal knowledge of problem (WQ 92-4 and 92-13).
- It is appropriate to name government as responsible parties (WQ 88-2, 89-12, and 90-3).
- Corporations should be named even where a dissolved corporation (WQ 89-14) or a successor in interest (WQ 89-

8).

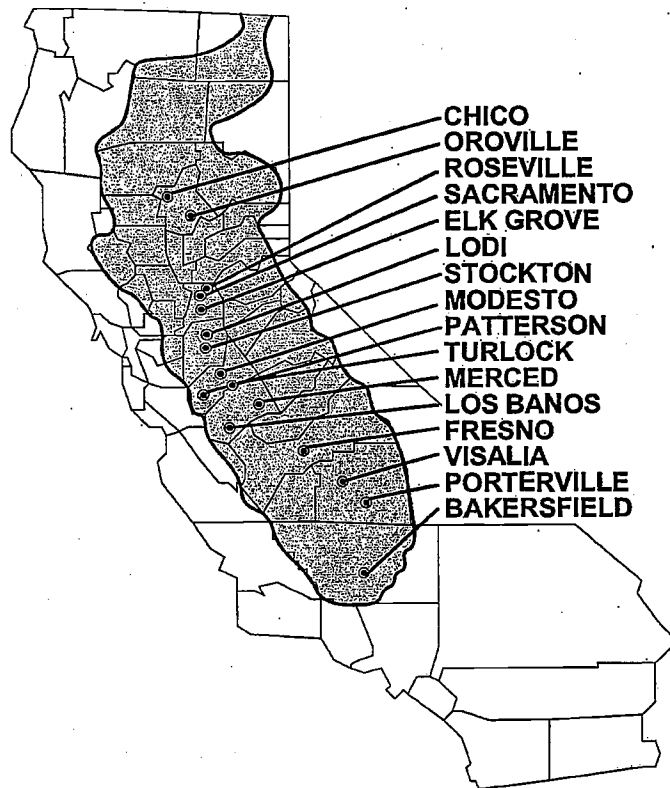
--- END OF PAGE 2 OF 2 ---
END OF MEMO & ATTACHMENT

EXHIBIT E

DRY CLEANERS— A MAJOR SOURCE OF PCE IN GROUND WATER

27 March 1992

CENTRAL VALLEY
CITIES WHERE MUNICIPAL WELLS ARE AFFECTED BY
TETRACHLOROETHYLENE (PCE)



WELL INVESTIGATION PROGRAM



STATE OF CALIFORNIA
Pete Wilson, Governor

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
James M. Strock, Secretary

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

John S. Corkins, Chair
Karl E. Longley, Vice Chair
Hank Abraham, Member
A. Vernon Conrad, Member
Hugh V. Johns, Member
W. Steve Tompkins, Member
Clifford C. Wisdom, Member

William H. Crooks, Executive Officer

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DISCLAIMER

This publication is a technical report by staff of
the California Regional Water Quality Control Board,
Central Valley Region.
No policy or regulation is either expressed or intended.

DRY CLEANERS—A MAJOR SOURCE OF PCE IN GROUND WATER

VICTOR J. IZZO
Associate Engineering Geologist

*Approved by the California Regional Water Quality Control Board,
Central Valley Region on 27 March 1992*

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EXECUTIVE SUMMARY

Tetrachloroethylene (PCE), a known carcinogen, has degraded at least 215 wells in the Central Valley of California. Figure 1 illustrates the extent of the problem. The majority of these wells are large system municipal wells of 200 connections of more. The Chico, Sacramento, Modesto, Fresno, Turlock, Lodi and Merced areas all have wells with levels of PCE above 0.8 ppb which is the estimated one in a million incremental cancer risk (8). The Maximum Contaminant Level (MCL) set by the Department of Health Services for drinking water is five ppb. Forty-seven of the 215 wells have PCE levels above the MCL.

The Well Investigation Program of the Central Valley Regional Water Quality Control Board so far has identified the likely PCE sources in 21 of the wells; in 20 of those wells, dry cleaners are the likely source. In areas where PCE well investigations were done, dry cleaners are the only present large quantity users of this volatile organic chemical (VOC). The Halogenated Solvent Industry Alliance 1987 white paper on PCE states that dry cleaners use 56% of the PCE used in United States (5). All dry cleaners in the vicinity of degraded supply wells show evidence of major ground water degradation. Monitoring wells drilled adjacent to dry cleaners had concentration from 120 ppb to 32,000 ppb, well above the MCL.

The main discharge point for dry cleaners is the sewer line. The discharge from most dry cleaning units contains primarily water with dissolved PCE, but also contains some pure cleaning solvent and solids containing PCE. Being heavier than water, PCE settles to the bottom of the sewer line and exfiltrates through it. This liquid can leak through joints and cracks in the line. PCE, being volatile, also turns into gas and penetrates the sewer wall. Sewer lines are not designed to contain gas. The PCE then travels through the vadose zone to the ground water.

Where a source investigation has been done in connection with PCE contamination, the evidence has shown that dry cleaners have degraded the ground water. The data strongly indicate that leakage through

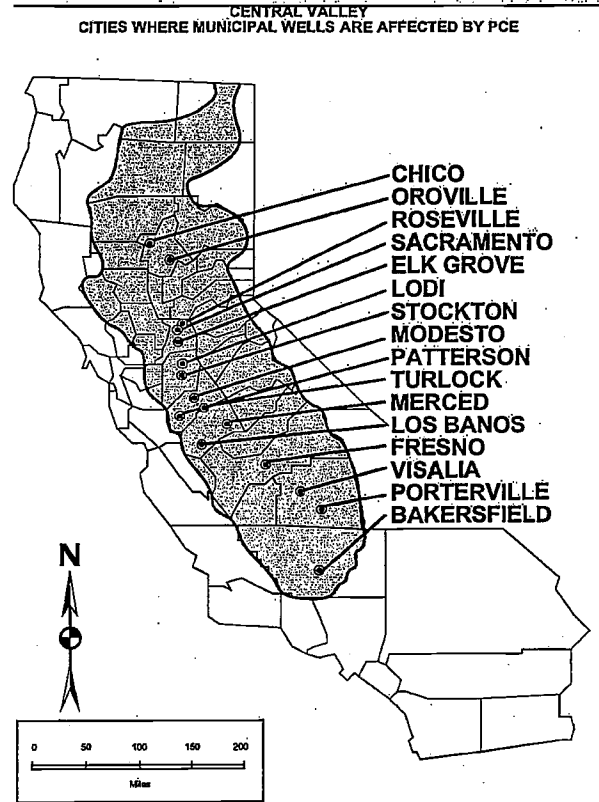


Figure 1

the sewer lines is the major avenue through which PCE is introduced to the subsurface. With approximately 285 dry cleaners in just the metropolitan areas of Sacramento, Chico, Lodi, Modesto, Turlock, Stockton and Merced, one would expect that many more wells will be degraded by PCE in the future. Most of the wells degraded by PCE and most of the dry cleaners are in residential and retail areas. Based on the data collected to date and the location of most of the degraded wells with confirmed PCE, a great majority of these wells will have dry cleaners as the source.

The solution to part of the problem is to halt the disposal of waste from dry cleaning units to the sewer line. Regulation of this discharge to the sewer could be achieved through new legislation and city ordinance. Since this problem exists throughout the state, a statewide policy seems appropriate.

The other part of the problem is ground water cleanup

which is required so that cities can continue to provide safe water. A state wide fund may be needed to help pay for cleanup.

INTRODUCTION

Over 750 wells have been reported to the California Regional Water Quality Control Board, Central Valley Region, with confirmed levels of volatile organic chemicals (VOCs). Greater than 35% of the reported wells contain tetrachloroethylene (PCE). Municipal drinking water supplies have been affected by PCE throughout the Central Valley (Figure 1). At least one city is already treating contaminated ground water in order to continue its water supply.

This report discusses some of the data and conclusions about PCE movement to ground water, the source of the PCE, and possible solutions. The report is divided into six sections.

*Introduction

* Tetrachloroethylene (PCE)

A brief description of the use of PCE and its physical and chemical properties.

* Source Identification for PCE Degraded Wells

A description of how Board staff determines the source of VOC(s) in a well and the results of PCE source investigations.

* Dry Cleaning Operations and Discharge Locations

General discussion of dry cleaning operations and waste discharge points.

* Evidence and Theory on How PCE is Leaving the Sewer

* Conclusion and Recommendations

TETRACHLOROETHYLENE (PCE)

PCE was first formulated in 1821 (22). By the 1960's and early 1970's, it had become a widely used solvent in dry cleaning, metal degreasing and other industries

(18). In the late 1970's, most industries moved away from the use of PCE. The exception was the dry cleaning industry. By the early 1980's, dry cleaners used the majority of the PCE in this nation (18). In the late 1980's, dry cleaners used 56% of the PCE used in United States (5).

Compared to many VOCs, PCE is very mobile, with relatively low solubility and vapor pressure. In its liquid state, it is heavier and less viscous than water and will sink through it. In the vapor phase, PCE's density is greater than air. PCE biodegradability is low in the subsurface. The following are some of the physical and chemical properties of PCE: ³

Molecular Weight	165.85 g
Solubility	150 mg/l at 25°C
Vapor Pressure	14 torr
Density	1.63 g/cm
Boiling Point	121 °C
Kinematic Viscosity	0.54 (water=1)
Henry's Law Constant	0.0131 atm-m /mole
Vapor Density	5.83 (air=1)
Specific Gravity	1.63 at 20° (water=1)
Relative Velocity	1.8 (water=1)

PCE is generally found in three phases in the subsurface: liquid, vapor, and dissolved in water. More than one phase usually exists in the subsurface after discharge. Figure 2 shows three possible scenarios at a discharge point.

VOCs will not adsorb to subsurface materials to any significant degree when those materials are nearly pure minerals which contain little organic matter. Most high-yield aquifers are nearly free of organic matter. The majority of fresh water aquifers and the vadose zone in the Central Valley are fan deposits from the Sierra Nevada and the Coast Range, and are composed primarily of low organic soils and substrata. Therefore, retention of VOCs in the Central Valley by soil and subsurface strata probably is very low.

PCE is a known carcinogen. The Water Quality Advisories for a 1-in-a-million incremental cancer risk

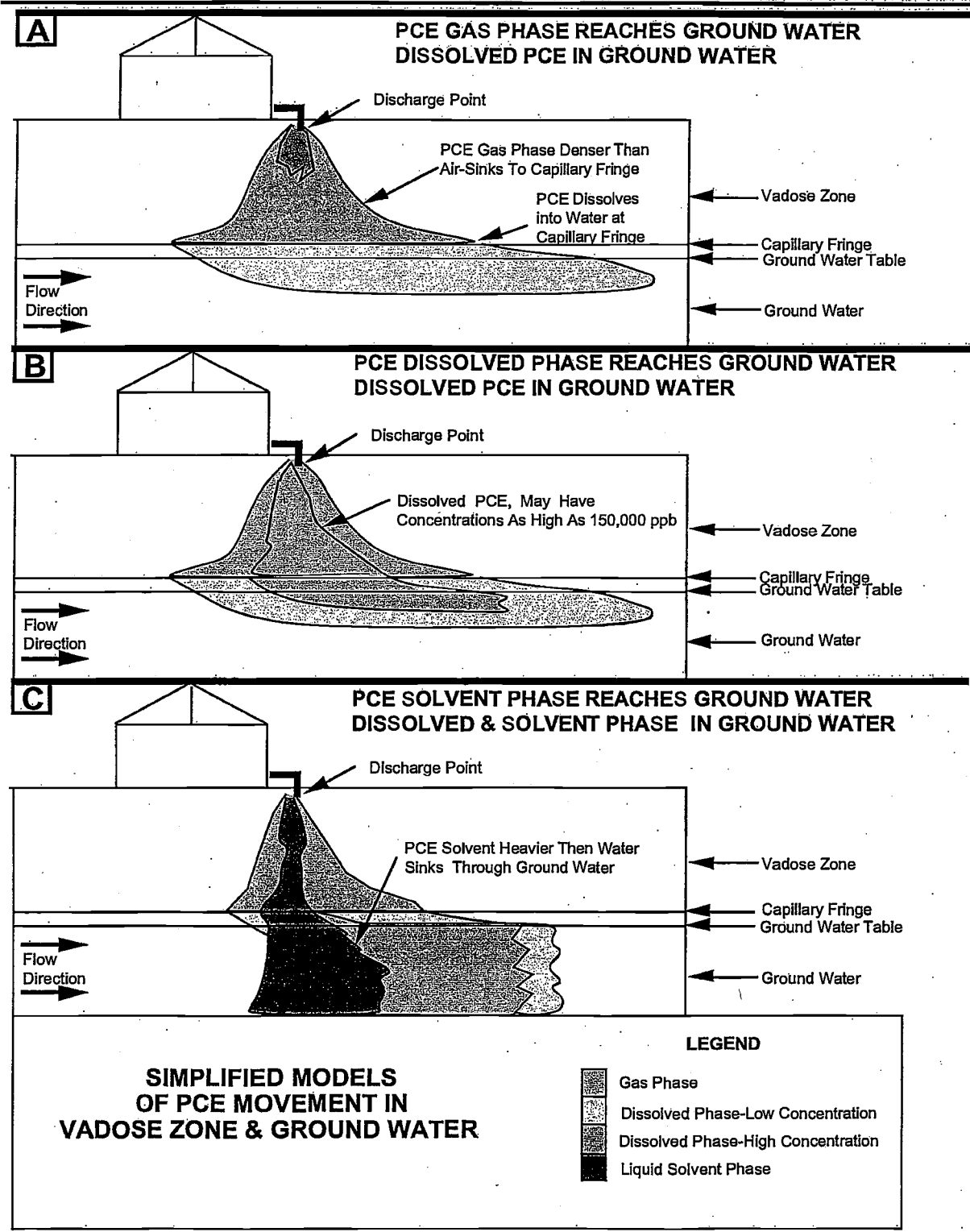


Figure 2

estimate is 0.8 ppb (8). The State of California Department of Health Services Maximum Contaminant Level (MCL) for PCE is five ppb.

SOURCE IDENTIFICATION FOR PCE DEGRADED WELLS

A source investigation is conducted by Board staff to identify the source(s) of contaminant found in a drinking water supply well. This section is divided into two parts: a description of the steps in a source investigation and a general discussion of the results of a PCE source investigation.

SOURCE INVESTIGATION

There are five general steps conducted in a source investigation as follows:

1. Well reported degraded by VOCs
2. Identify possible sources of the VOCs
3. Inspect the users of the VOCs
4. Identify ground water characteristics
5. Conduct a soil gas survey

In step 1, a drinking water well is reported degraded by a VOC to the Board. The main sources of this information are the California Department of Health Services, counties, municipalities and private water companies. The information starts the Board's formal source investigation.

In step 2, staff attempts to identify all possible uses of the VOC(s) of concern. For example, is it used as solvent or refrigerant? Then they identify the type of businesses that would use the VOC(s). At this point staff does research using business directories, phone books, and county and city records to identify those facilities (potential sources) in the past and present that might use or have used the VOC(s) found in the well. This search for potential sources is done for an area approximately 1/2 mile in radius around the well. Some record searches for have gone as far back as the 1930's.

In step 3, inspecting possible sources, a questionnaire

is first mailed to potential sources asking the facility operators about their uses of VOCs. This is the initial screening and reduces the quantity of field inspections. For example, if a facility is listed as a dry cleaner in the phone book and the questionnaire response says it is only a transfer station and no solvents are used, then the site would be removed from the potential source list and not inspected.

Staff inspects the facilities that use VOCs and determines if the potential source should be investigated further. If an investigation continues on a facility, then staff samples all discharges leaving the facility (discharges to land, water and sewer).

In step 4, identifying ground water characteristics, staff collects information from government and private ground water studies. The data collected from these studies are correlated to give a general understanding of the stratigraphy and ground water characteristics. This is not site-specific and is done after identifying possible sources so there is not a bias to upgradient sources.

In step 5, the soil gas survey is used to identify areas of VOCs in the soil and ground water. A survey involves placing glass tubes, each containing a carbon coated wire, open end down, 10-12 inches below the soil surface (Figure 3). After placement, the tubes are covered with soil. The evaporating VOC gasses disperse through the soils and reach the survey

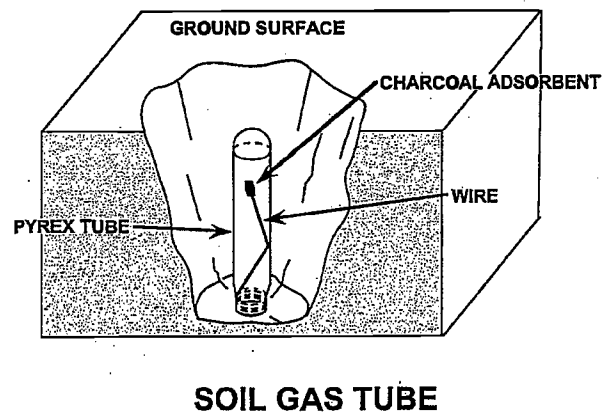


Figure 3

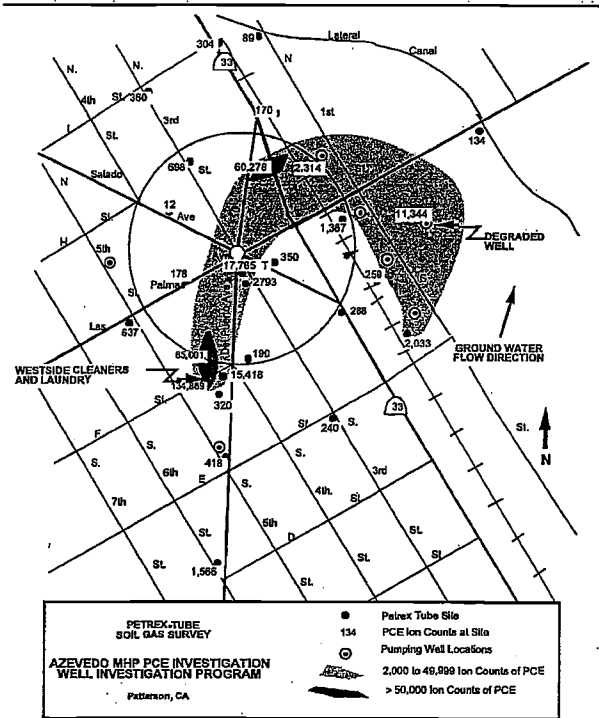


Figure 4

equipment. Approximately six week later, the tubes are removed and sent to the laboratory for VOC analysis. The results are in numbers of a specific VOC molecule retained by the carbon coated wire. The numbers are not concentrations, but are relative to each other. Locations with high counts have more of that VOC in the soil vapor than areas with low counts. Figure 4 is an example of the results of one of these surveys.

At this point the potential sources have been reduced to a few likely sources. It is at this time that site investigations are requested from the likely sources.

RESULTS OF PCE SOURCE INVESTIGATIONS

Staff source investigations have found that PCE is used in several industries (Figure 5) and is a component of several over-the-counter products such as brake and carburetor cleaners and spot removers. Staff surveys of industries other than dry cleaners which used these products show that PCE is not the main constituent in most of them. These products are usually less than 30% PCE, while dry cleaning solvent

IDENTIFIED SOLVENT USERS

- *Auto/Boat Industry
 - Service Stations
 - Auto Dealerships
 - Boat Dealerships
 - Truck Repairs
 - Auto Maintenance Facilities
- *Telephone Companies
- Elevator Service Companies
- Public Schools
- Mobile Home Parks
- *Dry Cleaners
- Laundries
- Print Shops
 - Newspapers
 - *Copying and Printing Businesses
- Machine Shops
 - Electric Motor Repair
 - Sheet Metal & Welding
- Lumber/Timber Industry
- *Over-the-Counter Products
 - Furniture
 - Strippers
 - Antique Shops
 - Upholstery Repair
- Power Stations
- Paint Dealers

* - Industries where at least one product has PCE

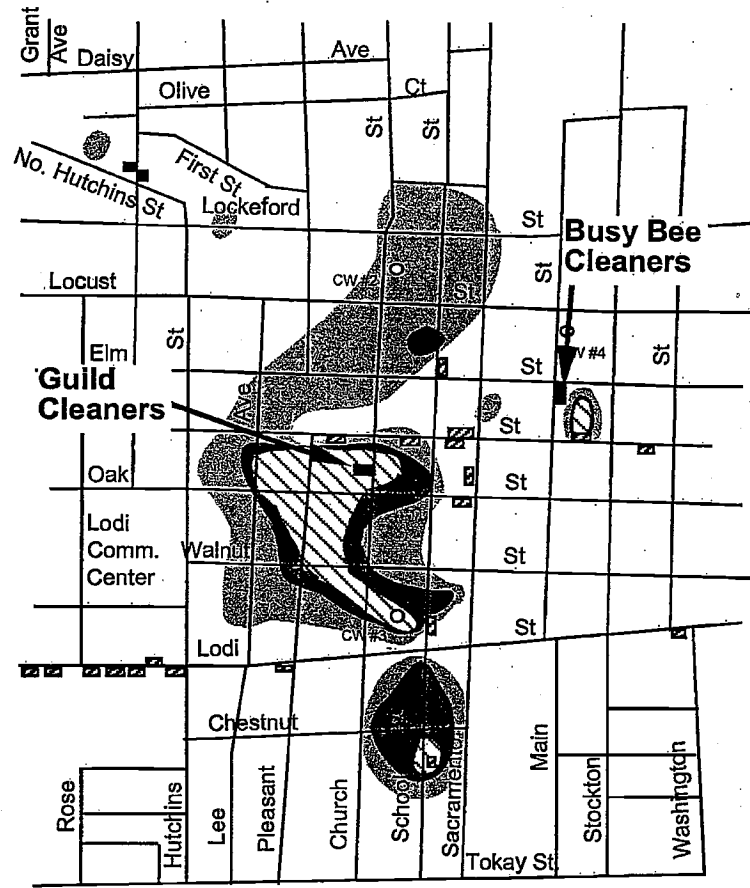
Figure 5

is 100% PCE. Dry cleaning uses a large quantity of PCE solvent compared to other potential sources. The typical cleaner uses between 15 and 40 gallons a month of pure PCE. Many of the other industries also collect the solvent after use for recycling and do not discharge waste liquids to the land or sewer. Also, many of the solvents used that contain PCE are in aerosol cans. The solvent is sprayed on the part to remove grease and as the part dries, the PCE volatilizes into the air. Most industries other than dry cleaners which use solvents have no daily discharge of waste liquids containing PCE.







The staff soil gas surveys, which include all solvent users, show dry cleaners as the source areas. Figures 6 and 7 are two examples. None of the soil gas surveys have shown PCE vapor plumes near other solvent users.

Based on questionnaires, inspections, handling practices and soil gas surveys, staff concludes that dry cleaning is a major source of PCE ground water degradation in the Central Valley.

**LODI
SEWER LINES**



EXPLANATION

- | | |
|--|--|
|  Currently operating dry cleaners |  Past dry cleaners |
|  < 10,000 PCE ion counts |  100,000 - 200,000 PCE ion counts |
|  10,000 - 100,000 PCE ion counts |  > 200,000 PCE ion counts |

SCALE

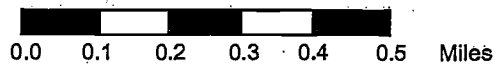


Figure 6

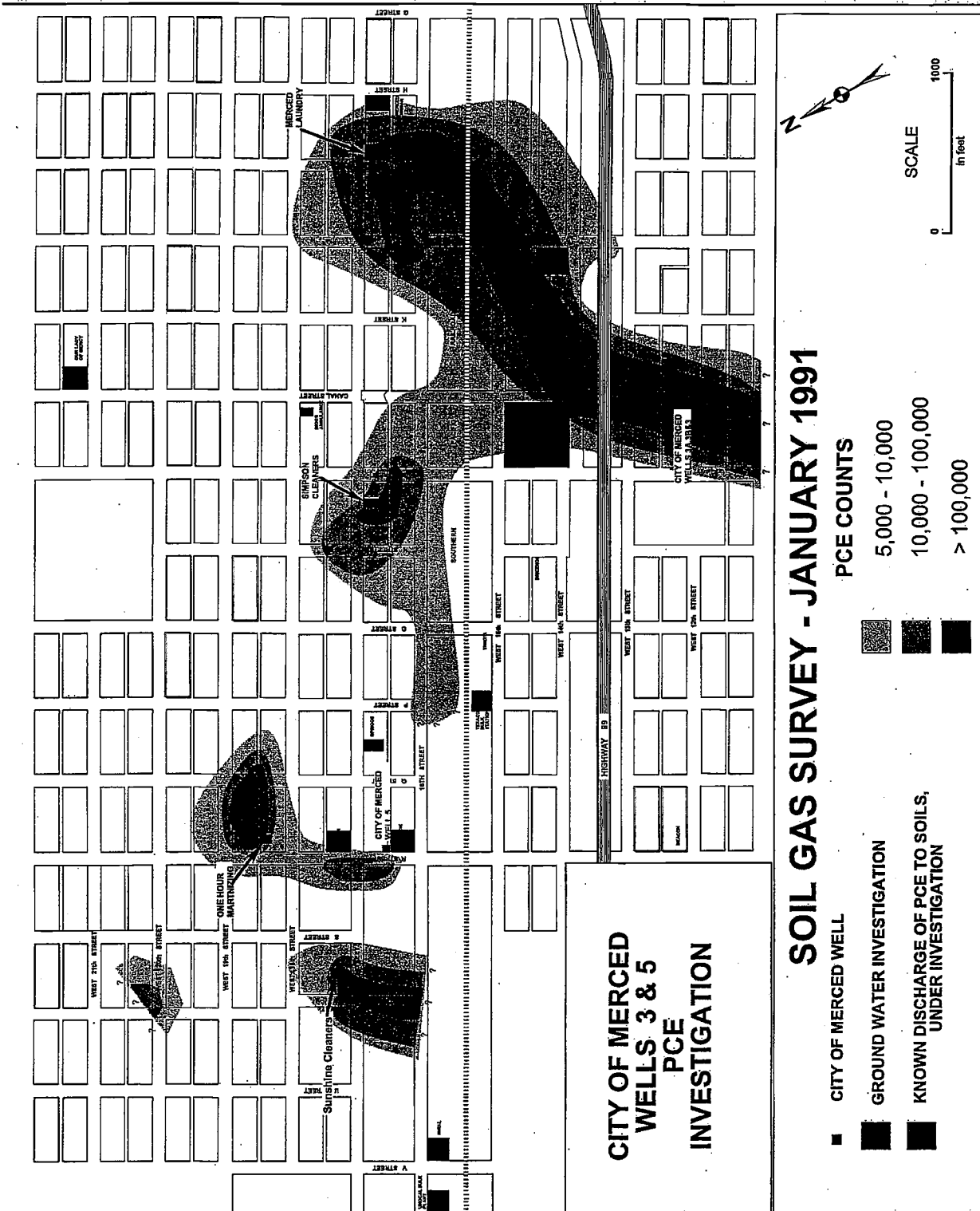


Figure 7

DRY CLEANERS OPERATION AND DISCHARGE LOCATIONS

There are two basic types of dry cleaning machines, transfer and dry-to-dry. Both have similar types of discharges with the dry-to-dry machine being more efficient. The only major difference is that the dry-to-dry unit does the washing and drying of the clothing in the same machine, while a transfer unit use separate machines. The following section is a general description of a facility containing a transfer unit.

Dry cleaning transfer systems include a dry cleaning wash unit, PCE storage tank (generally part of the wash unit), reclaiming (dryer), cooker and vapor condenser (Figure 8). Pure PCE solvent is added directly from the PCE tank to the wash unit. A small amount of water and soap is usually added to remove stains that PCE will not. Most facilities send the spent solvent (after washing cycle) through solid filter canisters to remove solids and then return it to the PCE tank in a closed system. The solvent in the PCE tank also is periodically purified by physical transfer to the cooker, which separates solvent from solids through distillation and forms a sludge at the bottom.

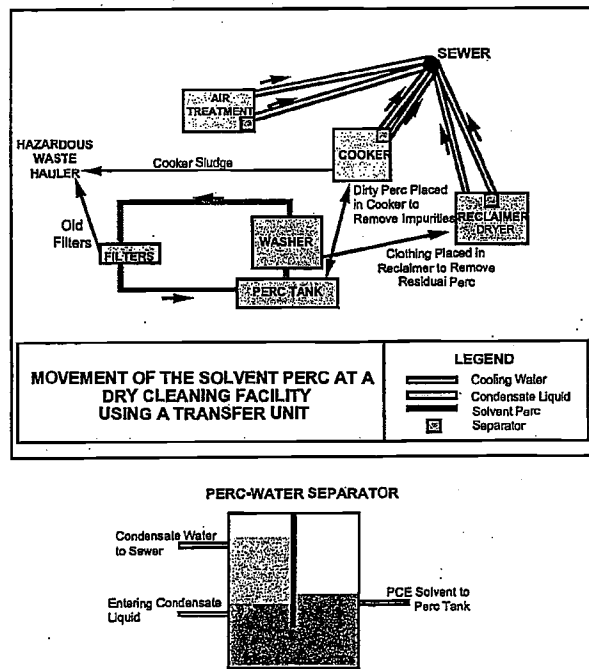


Figure 8

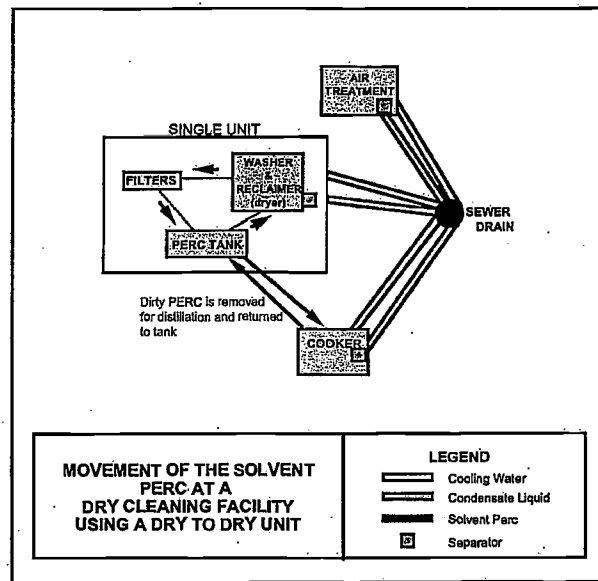
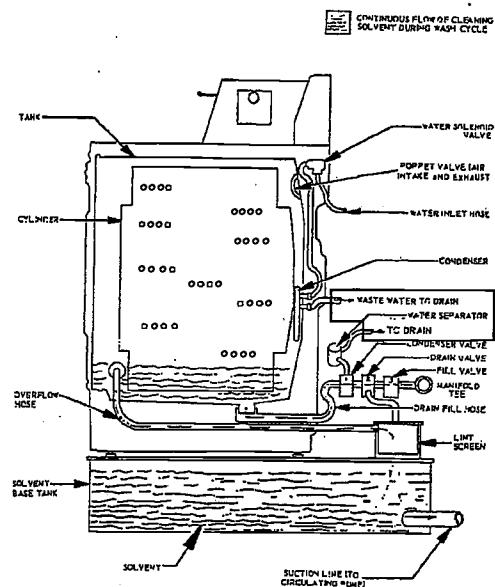


Figure 9

After washing, the clothing is removed from the wash unit and placed in the reclaiming to remove residual solvent. This drying process removes PCE solvent by heating the clothing which causes the solvent and any water to evaporate. The vaporized solvent and water is then removed from the drying portion of the machine and condensed. The PCE-water separator, which is connected to the back of the unit, takes the condensed liquid that contains PCE and water and allows the heavier PCE to settle to the bottom for reuse. The air scrubber (sniffer) extracts and cleans vapors from the other dry cleaning components and the air. These vapors also are condensed and the PCE and water separated.

In general, information provided by dry cleaner operators, inspections done by staff, and manufacturers' service manuals show that dry cleaning equipment is designed to discharge wastewater to the sewer. Figures 8 and 9 are schematics showing the two main types of wastewater discharges from dry cleaning equipment: liquid from the PCE-water separators and cooling water. Figure 10 is a schematic from one manufacturer's service manual that shows that wastewater should be discharged to the drain (11). This is typical of service manuals.



COIN-OP DRY TO DRY UNIT

Graphic From - Norge Sales Corporation, Service Instruction and Parts Catalog, 1981

Figure 10

The water from the PCE-water separators has been in direct contact with PCE. Water samples from separators at some cleaners have had such high concentrations of PCE that after the sample bottle sat for a day, solvent had separated out. As much as 30 percent of some samples has been pure solvent. PCE-water separator waste liquid has had PCE levels up to 1,119,300 ug/l (ppb), with an average of 151,800 ppb and median 64,000 ppb (Figure 11). Cooling water samples at dry cleaners have usually ranged from 3 to 70 ppb PCE, but some have been as high as 4,000 ppb (Figure 12).

EVIDENCE AND THEORY ON HOW PCE IS LEAVING THE SEWER LINES

Based on site inspections, the majority of the cleaners had only one discharge point and that was to the sewer. Because of these discharges, staff investigated sewer lines as a possible discharge point for PCE to the soils. Samples taken from these lines indicated that liquids or sludges with high concentrations of PCE are lying on the bottom of the sewer. Soil gas surveys

DRY CLEANERS SAMPLING RESULTS FROM CONDENSATE LIQUID

CLEANER	CITY	DATE	RESULT in ppb	UNIT
Busy Bee	Lodi	9/11/90	60,699	Reclaimer
Turlock Cleaners	Turlock	4/29/91	62,755	Cooker
Snow White	Turlock	1/26/89	140 56	Reclaimer Cooker
Durite Cleaners	Turlock	1/30/89	15,000 150,000	Sniffer & Reclaimer II Reclaimer I
Brite Cleaners	Turlock	5/11/89	66,000	Reclaimer
Southgate Norge	Sacramento	3/20/91	247,000	Sniffer & Reclaimer
Tillet Cleaners	Roseville	4/11/89	74,000	Reclaimer
Merced Laundry	Merced	11/29/88	130,000	Sniffer
Modesto Steam	Modesto	4/30/91	1,119,300 139,087 8,120 53,618	Reclaimer Cooker Chiller Reclaimer
		Median	64,000	
		Average	151,800	

Figure 11

CONCENTRATION OF ORGANIC CHEMICALS IN COOLING WATER FROM DRY CLEANERS

DRY CLEANERS	CITY	DATE	RESULTS in ppb
Busy Bee	Lodi	8/24/89	0.66 PCE 2.1 TCE 0.69 1,1-DCE
		8/28/90	1.2 PCE 1 TCE
DuRite	Turlock	11/29/91	6.3 PCE 4.7 PCE 1.7 PCE 5.3 PCE
Turlock	Turlock	5/21/90	0.8 PCE 1.3 PCE
Bright	Turlock	5/11/89	2.7 PCE
Tillet	Roseville	11/30/88	67 PCE 32 Chloroform
		2/10/89	1.1 PCE 23 Chloroform
Deluxe	Roseville	2/26/89	0.8 PCE 69 Chloroform
Elwood's	Modesto	4/30/91	14 PCE
Parkway	Merced	9/8/88	69 PCE
Simpson	Merced	9/8/88	38 PCE
Southgate Norge	Sacramento	1/12/89	28 PCE
Merced Laundry	Merced	11/29/89	4000 PCE

Figure 12

done by staff and by private consultants illustrate high PCE vapor concentrations along the sewer lines. Work done by the City of Merced shows that intact sewer lines can and have discharged PCE to the soil.

Below are descriptions of sampling done and our interpretation of the data. Following these descriptions is a section on the theories of how PCE escapes from the sewer pipes.

SOIL GAS SURVEYS

Soil gas surveys related to PCE in ground water have been done by Board staff in Sacramento, Lodi, Merced, Modesto, Stockton, Roseville and Turlock. Every place PCE molecules have exceeded 100,000 counts

and monitoring wells have been installed, PCE levels in ground water exceeded the MCL. In most cases, the PCE concentration in ground water has exceeded 300 ppb, which is 60 times the MCL. Thus, this survey technique has been very successful.

Figures 13 through 16 are maps showing results of soil gas surveys from Turlock, Modesto, Lodi and Merced which illustrate that PCE vapors are higher along the sewer lines. The highest counts are usually near the cleaners, but the counts continue high from the sites down the sewer line.

Around several dry cleaners near Stockton, a private consultant performed a soil vapor survey for PCE. The consultant extracted a volume of air from the soils

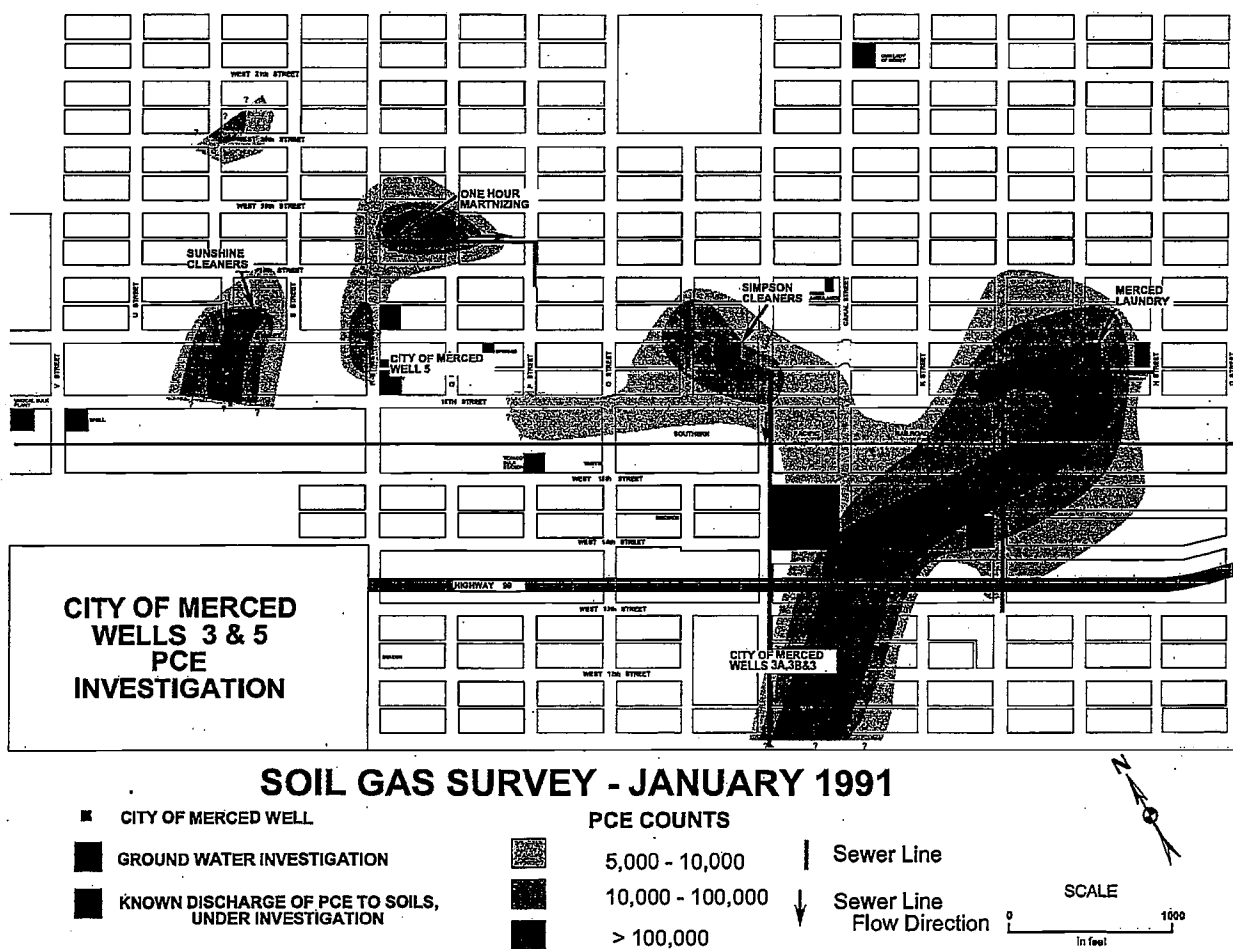


FIGURE 13

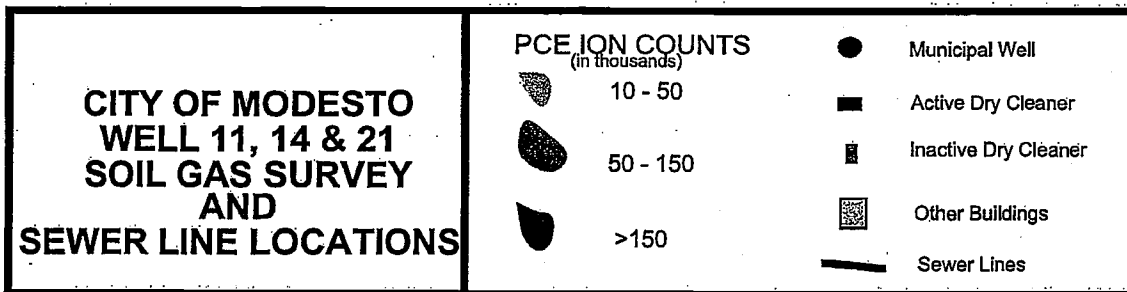
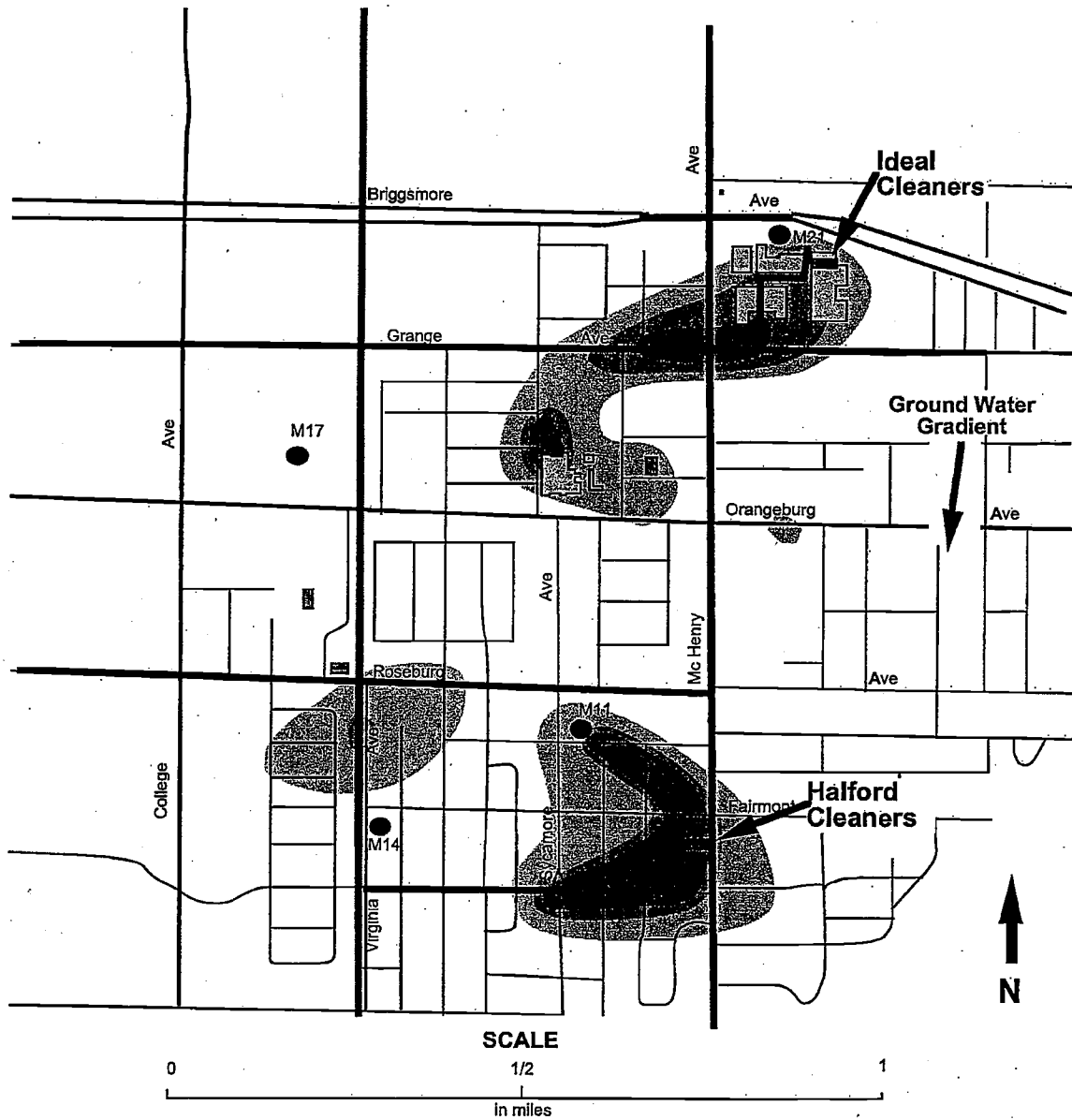
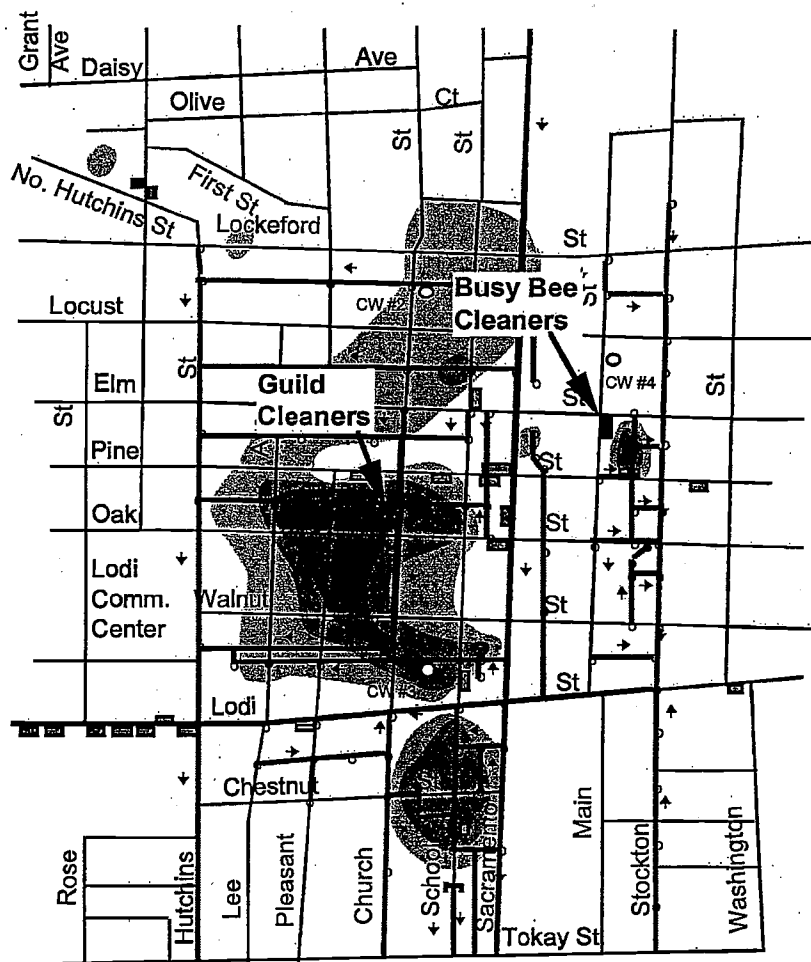










Figure 14

**LODI
SEWER LINES**



EXPLANATION

- | | |
|--|--|
|  Currently operating dry cleaners |  Past dry cleaners |
|  < 10,000 PCE ion counts |  100,000 - 200,000 PCE ion counts |
|  10,000 - 100,000 PCE ion counts |  > 200,000 PCE ion counts |
|  Sewer lines |  Sewer line flow direction |

SCALE

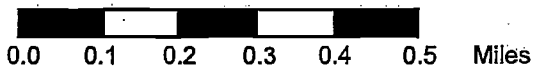
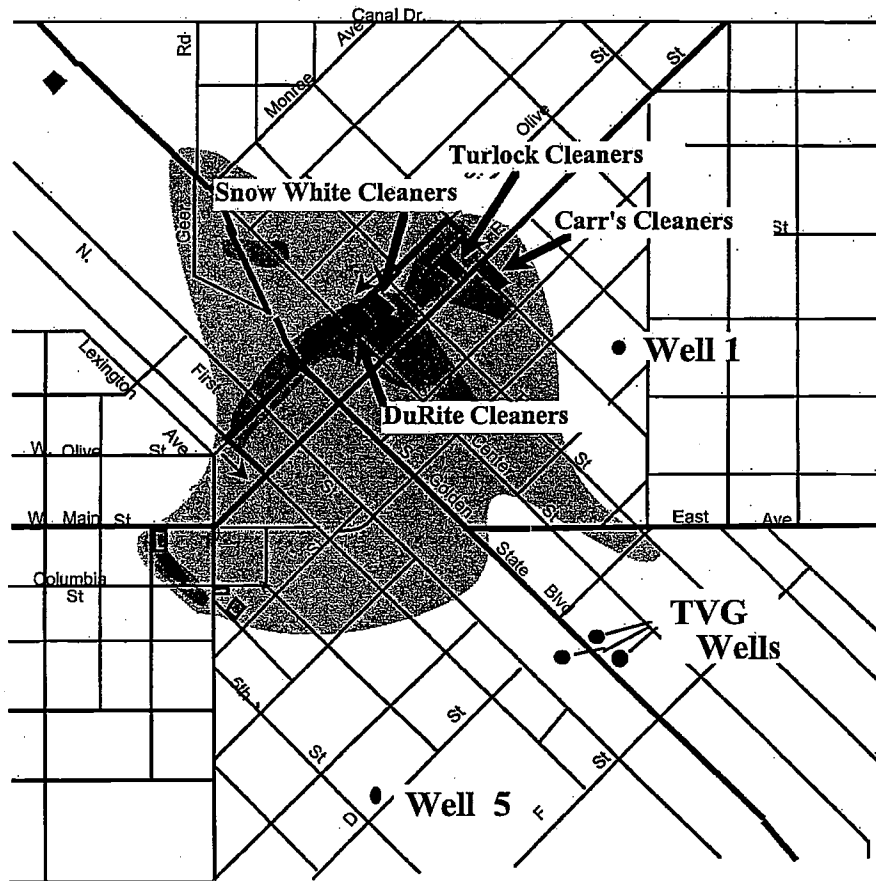


Figure 15

TURLOCK SOIL GAS SURVEY



- ◆ ACTIVE DRY CLEANER
- INACTIVE DRY CLEANER
- WELL
- SEWER LINE
- 10,000-100,000 PCE ION COUNT
- 100,000-200,000 PCE ION COUNT
- >200,000 PCE ION COUNT



Figure 16

and ran the sample through a gas chromatograph. This survey also indicates high concentrations of PCE vapor along the sewer line (Figure 17). There are

similar surveys done by other private consultants with the same results.

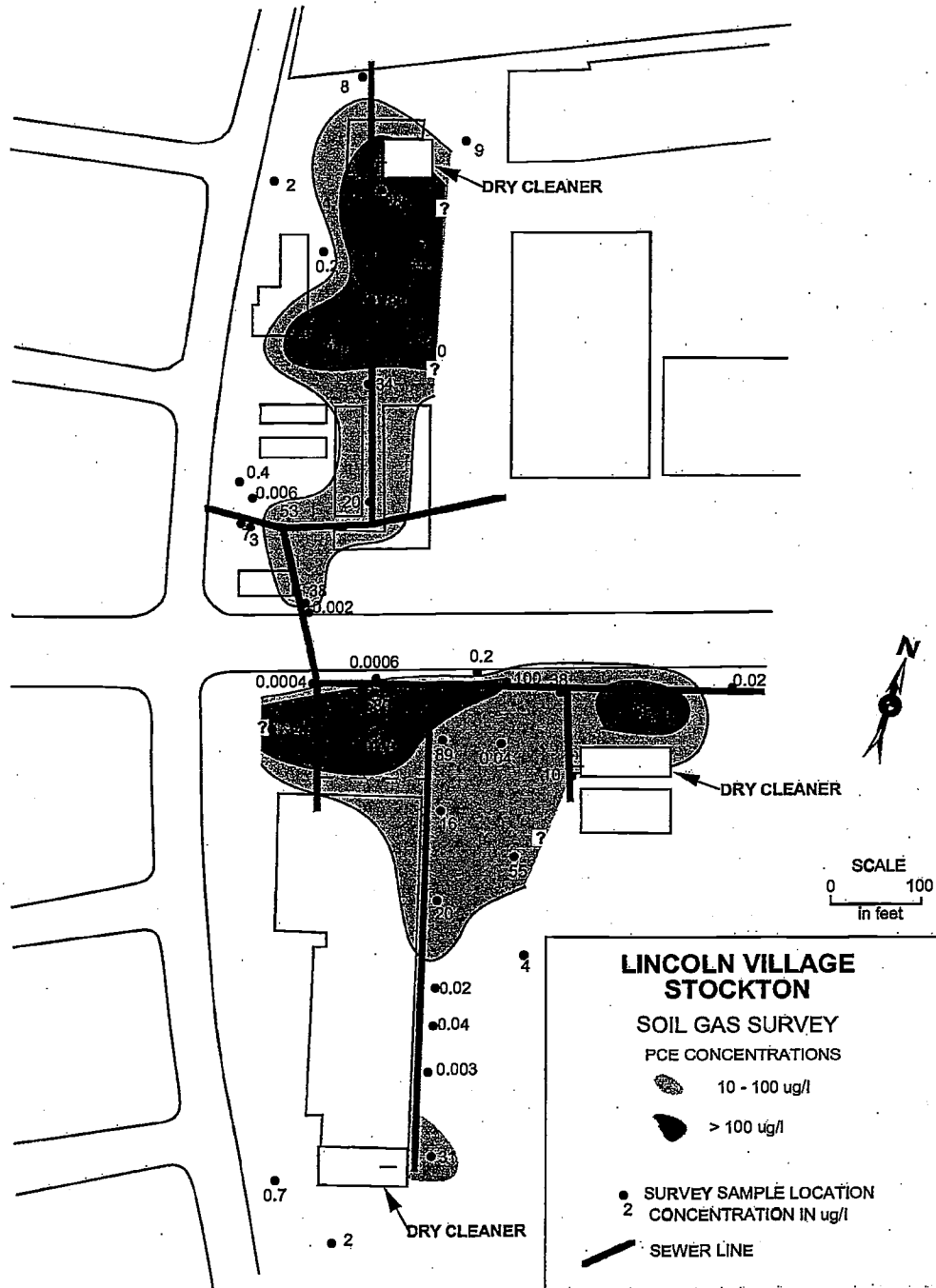


Figure 17

SEWER MAIN SAMPLING

Three samples are usually taken from the sewer: an upgradient, a downgradient and a flush sample. The upgradient (background) and downgradient samples are taken at the sewer access just above and below where the dry cleaner's sewer lateral enters the main (Figure 18). All samples are taken by placing a jar on a pole and scooping liquid into the jar. The liquid is then poured into volatile organic analysis (VOA) bottles and sent to a California certified lab for analysis. The flush sample is taken after stirring up the bottom sediment by adding large quantities of water (and sometimes running a ball down the line). The flush sample is taken at the downgradient sewer access, when an increase of flow is noted (Figure 18).

The concentration of PCE in the downgradient sample has always exceeded that in the upgradient sample, and in most cases PCE in the upgradient sample was not detected. When flush samples were taken, their PCE content almost always exceeded that in the

downgradient sample. Since water is being added to the system, one would expect the PCE concentration to decrease in the flush sample because of dilution. Therefore, the increase indicates that PCE liquids or sludges are sitting on the bottom of the sewer line.

CITY OF MERCED

Between 12 January and 2 February 1989, the City of Merced conducted soil sampling near four dry cleaners. The City staff did a video scan of the sewer lines at each of the cleaners to check for possible leaks. After these scans, they drilled a soil boring adjacent to the sewer line downgradient of each facility where a problem was seen on the video tape. If the tape showed no problem, they drilled adjacent to the sewer line near the dry cleaner. In each boring they took several soil samples and had them analyzed for VOCs by EPA Method 8010. They also took soil vapor measurements using a Sensidyne-Gastec system (similar to Draeger tubes) with a detection limit of 400 ppb.

In addition to the City's work, each dry cleaning facility had a monitoring well (MW) drilled as required by staff. Soil samples were taken every five feet during drilling and analyzed for VOCs using EPA Method 8010. One ground water sample was taken from each well and analyzed for VOCs using EPA Method 601.

Parkway Cleaners

Figure 19 contains the data from the Parkway Cleaners site. The MW was drilled approximately 22 feet from Parkway's sewer lateral and 15 feet from the sewer main. Soil samples from the well boring had low levels of PCE (<5 ppb). The concentration of PCE in the ground water was 160 ppb.

The City's video scan of the sewer main showed no breaks in the clay pipe. Because of this, the City arbitrarily selected a soil boring site adjacent to the sewer line, six feet downgradient from Parkway Cleaners' sewer lateral. The PCE concentration in the soil sample in the City soil boring was 120 times

SEWER SAMPLING ADJACENT TO DRY CLEANERS

	Upgradient in ppb	Downgradient in ppb	Flush in ppb
MERCED			
Merced Laundry	-	180	-
One Hour Martinizing "R"	NF	110	23,000
One Hour Martinizing "G"	NF	730	96,000
Simpson Cleaners	-	-	6,300
Sunshine Cleaners	NF	-	167,000
Parkway Cleaners	NF	853	280,000
SACRAMENTO			
Southgate Norge Cleaners	NF	350	830
ROSEVILLE			
Deluxe Cleaners	-	120	260
Tillets Cleaners	NF	28	380
TURLOCK			
Carr's Cleaners	<0.5	14	2.5
Snow White Cleaners	1,800	3,800	220
Turlock Cleaners	NF	3,500	<25
Bright Cleaners	<0.5	0.6	23,000
Durite Cleaners	35	190	<5
LODI			
Busy Bee	NF	700	280,000
Woodlake Cleaners	-	620	210,000
Guild Cleaners	<0.5	24	<5
		Median 190	3,565
		Average 748	67,937

NF - NO FLOW

Figure 18

PARKWAY CLEANERS

MERCED

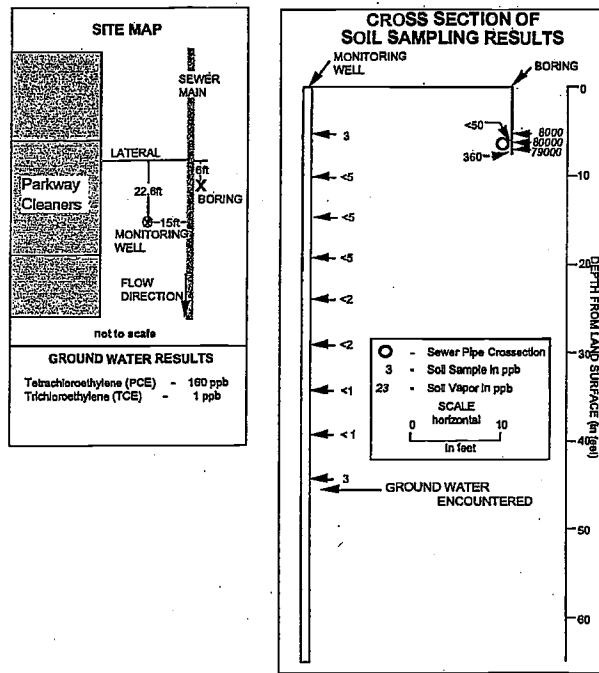


Figure 19

higher than was found in the MW. Also, soil vapor samples in the City boring contained up to 80,000 ppb PCE.

At this location the levels in the soil are much higher adjacent to the sewer line than in the MW. Also the data from the sampling adjacent to the sewer line indicate that PCE has moved from the line into the adjacent soils.

Simpson's Cleaners

Figure 20 illustrates the data from the Simpson's Cleaners site. Soil samples taken during the drilling of the MW at the southwest corner of the facility had PCE levels from non-detect to 71 ppb. The shallow ground water sample had 270 ppb PCE and also contained 29 ppb trichloroethylene (TCE), 65 ppb cis-1,2-dichloroethene (DCE), two ppb trans-1,2-DCE, and 6 ppb 1,2-dichloroethane, all of which are breakdown

SIMPSON'S CLEANERS

MERCED

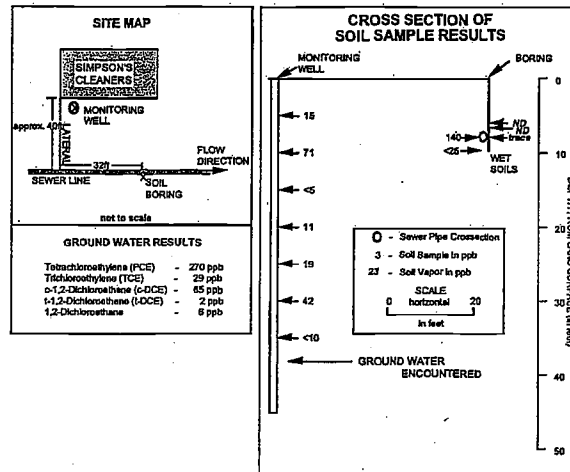


Figure 20

products of PCE. The MCL for TCE is 5 ppb and for DCE is 6 ppb.

The City's video scan of the clay sewer main adjacent to the cleaners showed a break at one of the joints. This break is approximately 40 feet downstream along the sewer line from the southeast corner of Simpson's Cleaners. While drilling alongside this joint the soil became very wet. One of the soil samples had 140 ppb PCE, higher than samples taken from the MW boring. The soil gas measurement readings were non-detect.

Again the soil sample adjacent to the sewer line contained higher PCE levels than samples taken from the MW boring. One probable reason the soil gas measurements were non-detect at the joint was the soils were very wet, which means the soil pores were probably full of water leaving no available room for the soil vapor.

Sunshine Cleaners

Figure 21 contains the data from the Sunshine Cleaners site. The MW was drilled near the northeast corner of the cleaners, 9.5 feet from its sewer lateral. The soil samples from the MW had PCE concentrations up to

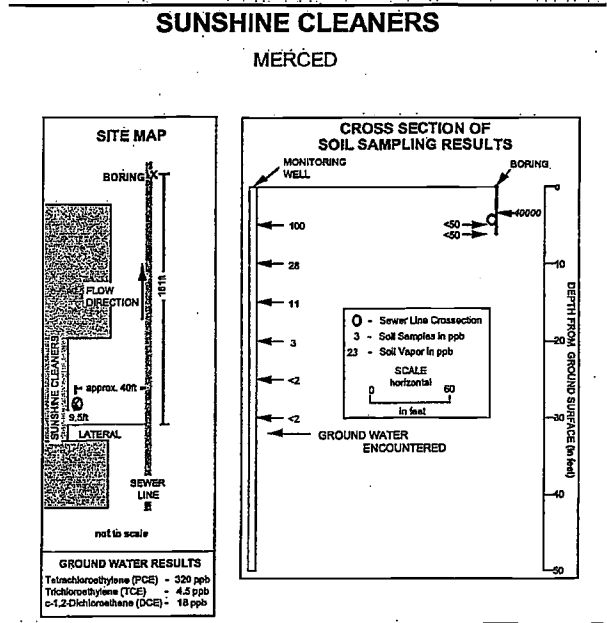


Figure 21

100 ppb. The ground water sample had 320 ppb PCE, 4.5 ppb TCE and 18 ppb DCE.

The City's video scan of the sewer line showed no breaks in the concrete sewer main. The City personnel chose a sag in the sewer main where the water pools for the location of the adjacent soil boring. This site was 181 feet downgradient of the cleaner's sewer lateral. PCE in the soil samples was nondetect, but the detection limit was high at 50 ppb. The Sensidyne-Gastec vapor system had a reading of 40,000 ppb in the boring.

The high levels detected by the Sensidyne-Gastec system indicates even at a distance of 181 feet downgradient from the dry cleaner, the concentration of PCE in the soil gas is significant. No comparison of soil samples between the MW and City's soil boring can be made because of the high detection limit from the City's samples.

One Hour Martinizing "R" Street

Figure 22 shows the data from the One Hour Martinizing "R" Street site. The MW was drilled eight feet northwest of the sewer line approximately 16 feet

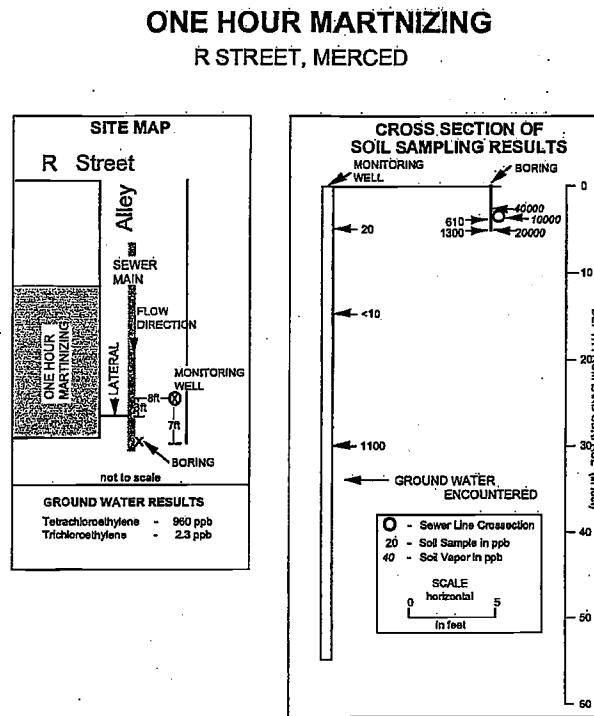


Figure 22

from the cleaner's northwest wall. PCE levels in the soil samples taken during drilling of the MW were low in the upper 20 feet ranging from nondetect to 20 ppb, but near the ground water a soil sample had 1,100 ppb PCE. The ground water sample had PCE and TCE with concentrations of 960 ppb and 2.3 ppb, respectively.

The City's video scan of the clay sewer line showed no breaks. The City personnel decided to drill adjacent to a bell joint four feet downgradient from where the cleaner's sewer lateral intersects the sewer main. Soil samples in this boring had PCE at 610 ppb (depth 461') and 1,300 ppb (depth 63"). The City took three Sensidyne-Gastec system measurements at the following depths from the surface: 361' (above the main), 461' (bottom side of pipe) and 631' (below the main), and the readings were 40,000 ppb, 10,000 ppb and 20,000 ppb, respectively.

Along the sewer main, the soil gas measurements and

the soil samples had high levels of PCE, indicating that at this location the sewer main is discharging PCE.

THEORIES ON HOW PCE LEAKS FROM SEWER LINES

Based on staff field work and research, there are five likely methods by which PCE can penetrate the sewer line:

1. Through breaks or cracks in the sewer pipes
2. Through pipe joints and other connections
3. By leaching in liquid form directly through sewer lines into the vadose zone
4. By saturating the bottom of the sewer pipe with a high concentration of PCE-containing liquid and then PCE volatilizing from the outer edge of the pipe into the soils
5. By penetrating the sewer pipe as a gas

The literature indicates that all sewer lines leak to some extent. According to Metcalf and Eddy, Inc., "When designing for presently unsewered areas or relief of overtaxed existing sewers, allowance must be made for unavoidable infiltration..." (6). If the soils become saturated and liquids can infiltrate, then a conclusion can be made that liquids on the inside of the pipe can exfiltrate when soils are not saturated.

Below is a brief description of the five methods.

Methods 1 and 2

Methods 1 and 2 are similar in that leakage of liquid is caused by a failure of the sewer pipe system. The failure could be catastrophic, causing large volumes of liquids to leave the system, or could consist of many small leaks causing constant smaller flow. These discharged liquids then would move down through the vadose zone to the ground water. Methods 1 and 2 also apply to PCE in vapor form which can move easily through breaks, cracks, joints, and other connections.

Many of the sewer lines have low spots in which liquids accumulate. These low spots are caused by

settlement or poor construction which causes the sewer line to bend. Sewer pipes are brittle, so when the line bends, fractures are likely to occur, increasing the leakage of the pipe. Since PCE is heavier than water (1.63 times the weight of water at 20°C), it tends to collect in these low spots and then flow through the pipe fractures into the vadose zone.

At pipe joints and other connections, PCE can move out of the sewer as liquid or gas. Also, as the pipes shift after installation, they could separate at the joints, allowing PCE to discharge even more easily to the vadose zone. Current gasket technology and reduction in leakage factors of pipes by the industry has reduced discharges at this point. But most commercial and retail districts in the cities of the Central Valley have pipes that predate this technology.

Method 3

By this method, PCE-containing wastewater or PCE liquid penetrates a sewer pipe without any breaks. In this case liquid leaves the pipe and enters the vadose zone (Figure 23). Sewer pipe is not impermeable to water or PCE. When liquid collects in a low spot of the sewer pipe, it cause an increase in the hydraulic

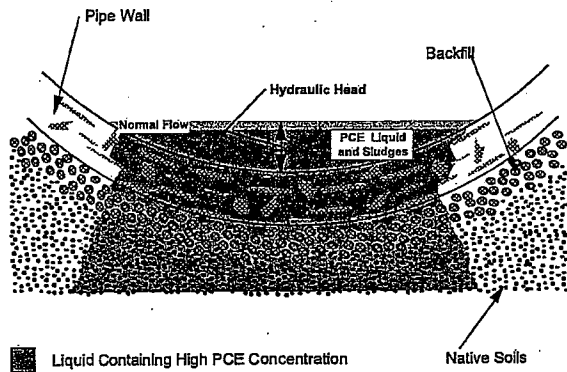
head in the line. This extra head provides a larger driving force downward through the pipe.

From sewer sampling we know that PCE-containing sludges and/or liquids collect on the bottom of the sewer line. Video taping of sewer mains have shown that almost all lines have low points where liquids and sludges collect. Because PCE is heavier than water and is attracted to organic matter, it would have a tendency to collect in these low spots. Also, PCE viscosity is less than that of water (0.9 for PCE versus 1 for water), making it flow easier through a pipe wall than water. This makes the pipe more permeable for PCE.

Method 4

This is similar to Method 3 except that the hydraulic head in the pipe is not large enough to force liquid

**PIPE EXFILTRATION
PCE IN LIQUID PHASE**



FLOW FROM PIPE TO GROUND WATER

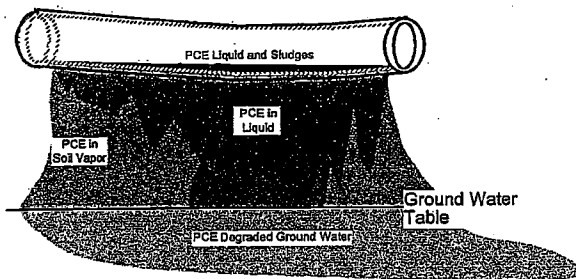


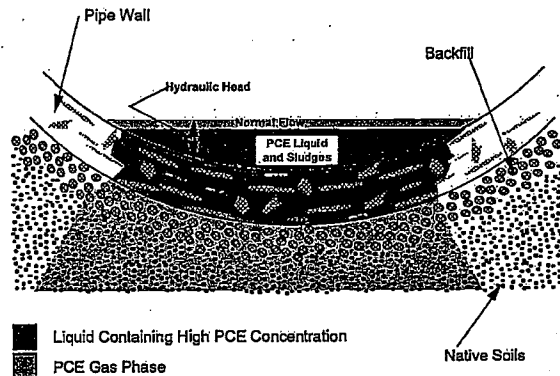
Figure 23

into the vadose zone. In this method, the pipe walls still have a high concentration of PCE-containing liquids (Figure 24). Being volatile, PCE turns into a gas at the liquid-soil vapor interface at the outer edge of the pipe. Since the vapor density of PCE is 5.83 times greater than air, the PCE gas in soil vapor would sink towards ground water, causing ground water degradation.

Method 5

In this method, PCE volatilizes inside the pipe and moves as a gas through the sewer pipe wall (Figure 25). The piping material is not designed to contain gas. The concentration of PCE gas in the pipe is greater than in the surrounding soils causing a concentration gradient. This causes a dispersion through the

**PIPE EXFILTRATION
PCE ENTERS PIPE WALL AS A LIQUID
AND THE SOIL AS A GAS**



FLOW FROM PIPE TO GROUND WATER

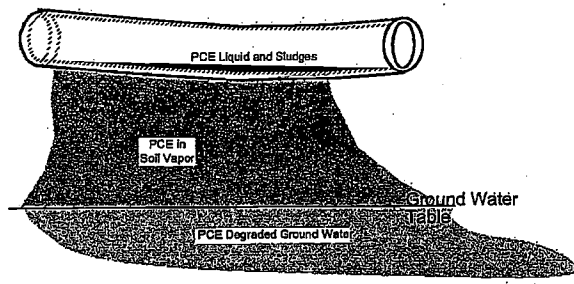


Figure 24

sewer pipe to the less concentrated area. Another reason gas will penetrate the pipe is due to pressure. The gasses inside the pipe may increase the pressure above atmospheric. This would cause a pressure gradient from higher pressure in the pipe to lower pressure in the vadose zone. The gradient would force PCE gas into the vadose zone. As described above, PCE gas is heavier than air and so would tend to sink towards ground water.

Summary of Methods

Methods 3, 4 and 5 probably occur in all piping. They would cause a constant influx of PCE into the vadose zone downgradient from a dry cleaner. This liquid containing PCE or PCE in gas form then moves downward and eventually degrades the ground water.

PCE PENETRATES A PIPE AS A GAS

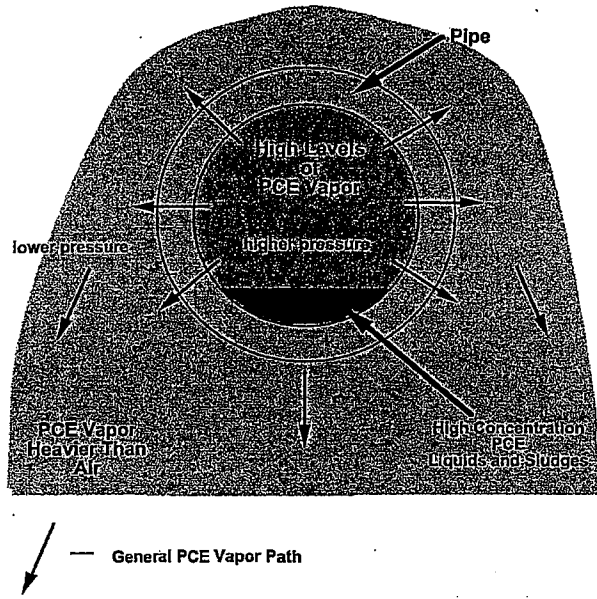


Figure 25

Leakage through small fractures in Method 1 is likely in most of these brittle pipes as they settle. Small fractures occur causing an increase in the permeability of the pipe. This would cause a constant leakage. These small fractures cannot be seen by video taping the inside of the sewer pipe.

CONCLUSION AND RECOMMENDATION

The Board has identified the potential sources of PCE in 21 wells, and 20 of those are affected by one or more dry cleaners. Because of the location of the remaining wells (i.e. in residential and retail areas), the staff expects that the majority of the wells with PCE will have dry cleaners as the source.

The evidence from five years of investigations shows PCE has been found in the ground water and vadose zone near dry cleaners throughout the Central Valley. In most dry cleaners, the only liquid discharge of PCE-containing wastewater is to the sewer line. The substantial evidence collected by dry cleaners' consult-

ants, municipalities, and staff, shows or demonstrates that PCE has discharged from the sewer lines directly into the vadose zone. The PCE then migrates through the unsaturated subsurface to the ground water. Based on information collected from operators of dry cleaners, dry cleaning literature and staff site inspections, the dry cleaning equipment at most facilities is designed to discharge to sewer lines.

Presently, all the dry cleaners investigated in a well source investigation have been identified as sources of PCE in the ground water. All of the dry cleaners that have drilled monitoring wells have had shallow ground water contamination well above the MCL of 5 ppb set by the State Department of Health Services (monitoring well levels range from 120 - 32,000 ppb). With approximately 285 dry cleaners in the cities of Sacramento, Chico, Lodi, Modesto, Turlock, Stockton and Merced, and numerous more in other cities, staff expects that many more wells will be degraded by PCE in the future.

In conclusion, the PCE discharges from dry cleaners to sewer laterals, then to sewer systems and then to soils have caused soil and ground water degradation.

Two major issues need to be resolved on the dry cleaners' PCE discharges:

1. Who should define the extent of ground water degradation and do the cleanup?
2. How do we prevent further degradation of the ground water by dry cleaners?

Ground water cleanup is required so that water supply agencies can continue to provide safe water. Deciding who should investigate and cleanup ground water is a complex political/legal issue since the PCE discharges from the dry cleaners were all approved, standard practice and those from the sewers were unsuspected. Because most dry cleaners are small businesses, which may not have the financial capability to define the contamination plume and conduct cleanup, other resources may be needed. A statewide cleanup fund may be appropriate. If no one else cleans

up the ground water, water supply agencies will have to do it by default.

To prevent further degradation, the most obvious solutions are to set a limit for PCE discharge levels to the sewer line that will protect ground water or to disallow all future discharges to the sewers from dry cleaning. Two possible ways to accomplish this:

1. State legislation to set limits or prohibit discharge of PCE from dry cleaning facilities to sewer systems.
2. City ordinances to set limits or prohibit any discharge of PCE from a dry cleaning facility to the sewer line.

Since dry cleaners exist throughout the state a state-wide policies are needed.

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