

## **EXHIBIT 13**

### **General Knowledge of MTBE**

- Memorandum from Krista Clark, Ass'n of Cal. Water Agencies, to MTBE Work Group (May 12, 1998) (FRESNO-MTBE-007866-7869);
- Pl.'s Resp. to Interrog. No. 78 from Chevron Defs.' Second Set of Interrogs.;
- Nat'l Ground Water Ass'n, The Southwest Focused Ground Water Conference: Discussing the Issue of MTBE and Perchlorate in Ground Water (June 3-4, 1998) (FRESNO-MTBE-009307-9422); and
- Anne M. Happel et al., Lawrence Livermore Nat'l Lab., An Evaluation of MTBE Impacts to California Groundwater Resources (June 11, 1998) (FRESNO-MTBE-011404-11477).

MAY. 12. 1998 3:50PM

916 325 4849 ACWA

NO. 5867 P. 2



**DATE:** May 12, 1998

**TO:** MTBE Work Group

**FROM:** Krista Clark

**SUBJECT:** Various MTBE-Related Issues

*ACWA's mission is to assist its members in promoting the development, management and reasonable beneficial use of good quality water at the lowest practical cost in an environmentally balanced manner.*

There are a number of issues surrounding MTBE that I would appreciate some input on. They are:

1) As you may have heard, DHS is going to be setting the secondary standard for MTBE at 5 ppb. Because the proposed rule was held up for a long time in the Department of Finance, DHS is going to have to use the emergency rule making procedures for the regulation. This means that our comment period and involvement will be reduced. Do we have any positive or negative feedback for DHS regarding the use of this process?

2) Attached is ACWA's MTBE Policy Statement that hopefully most of you have already seen. I have heard very few comments from anyone regarding this policy. Just a reminder that we are going to be taking it to the ACWA Board of Director's in two weeks and need any comments submitted by this Friday.

3) The Office of Environmental Health Hazard Assessment (OEHHA) is holding a public work shop on the proposed PHG for MTBE, which has been set at 14 ppb. It will be held this Friday, May 15, at the DHS Berkeley offices. We would like to encourage all of you to attend this important work shop. Please give me a call if you would like any additional information.

Thanks for your attention to these issues. Please call or fax me with any input!

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05/12/98 21:02:06

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK**



Aug 29 2011  
11:49PM

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**In re: Methyl Tertiary Butyl Ether ("MTBE")  
Products Liability Litigation**

**Master File No. 1:00-1898  
MDL 1358 (SAS)  
M21-88**

**The Honorable Shira A. Scheindlin**

**This Document Relates To:**

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*City of Fresno v. Chevron U.S.A. Inc., et al.,  
Case No. 04 Civ. 04973 (SAS)*

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**PLAINTIFF CITY OF FRESNO'S RESPONSES TO CHEVRON DEFENDANTS'  
SECOND SET OF INTERROGATORIES TO PLAINTIFF**

Plaintiff City of Fresno ("City" or "Fresno"), by and through its attorneys, Miller, Axline & Sawyer, makes the following Responses and General Objections to Chevron Defendants' Second Set of Interrogatories to Plaintiff.

**GENERAL OBJECTIONS**

1. The City objects to Chevron's Discovery to the extent that it seeks information or documents outside the scope of discovery permissible under the Federal Rules of Civil Procedure,
2. The City objects to Chevron's Discovery to the extent it seeks documents or information covered by the attorney-client privilege, the work product privilege, or any other applicable privilege or immunity. The City's responses are not intended as, or should be construed as, a waiver or relinquishment of any part of the protections afforded by the attorney-client privilege, the work product privilege, or any other applicable privileges or immunities.

any claim or defense, and does not appear to be reasonably calculated to lead to the discovery of admissible evidence. Plaintiff incorporates the general objections. Subject to and without waiving its objections, plaintiff responds as follows:

Plaintiff may have received publications concerning associations, organizations, or affiliations which are equally available to all parties. Plaintiff or its employees may have received publications from the associations, organizations, or affiliations listed in plaintiff's Response to Interrogatory No. 76.

**INTERROGATORY NO. 78:**

Describe in detail any and all of the conferences, lectures and/or presentations YOU attended, sponsored and/or spoke at CONCERNING water issues, such as MTBE, TBA and/or other contaminants in the groundwater, including, but not limited to, the name(s) of the conferences, lectures and/or presentations YOU attended, sponsored and/or spoke at, the dates of those conferences, lectures and/or presentations, and YOUR role and/or title in those conferences, lectures and/or presentations.

**RESPONSE TO INTERROGATORY NO. 78:**

Objections: overly broad and unduly burdensome. The request is so general and overbroad that the request violates FRCP 26(b)(1), because the matter sought is not relevant to any claim or defense, and does not appear to be reasonably calculated to lead to the discovery of admissible evidence. Plaintiff incorporates the general objections. Subject to and without waiving its objections, plaintiff responds as follows:

City personnel recall one specific conference regarding MTBE, and the document related to that conference has been produced, see FRESNO-MTBE-009307. Plaintiff has produced

electronic materials from conferences concerning water issues, see the CDs at FRESNO-MTBE-009422 through FRESNO-MTBE-009430. Plaintiff has produced presentations given by its personnel concerning water issues, see, e.g., FRESNO-MTBE-011644, FRESNO-MTBE-011766, FRESNO-MTBE-012875, FRESNO-MTBE-013237, FRESNO-MTBE-014514, FRESNO-MTBE-014969.

**INTERROGATORY NO. 79:**

If YOU contend that individuals can smell and taste MTBE in water at levels lower than 5 parts per billion as alleged in paragraph 57 of the COMPLAINT, state all facts upon which YOU base YOUR contention.

**RESPONSE TO INTERROGATORY NO. 79:**

Objections: overly broad and unduly burdensome. Plaintiff incorporates the general objections. The subject of taste and odor of MTBE in groundwater will likely be a topic for experts. Plaintiff further objects to the extent the interrogatory asks plaintiff to summarize and provide an analysis of documents, including those produced or maintained by public entities and defendants. Subject to and without waiving its objections, plaintiff responds as follows:

A 1993 industry study concluded that the concentration at which 70% of an experienced panel can detect the flavor of MTBE in water is between 0.04 and 0.06 ppb. (Plaintiff's *South Tahoe* Trial Ex. 518, Campden Study, "Flavour and odour thresholds of MTBE in water.")

The largest manufacturer of MTBE in the United States, Lyondell Chemical Company (formerly Arco Chemical Company), notified its clients in January 2003 that MTBE "can impart a displeasing taste and odor" and when drinking water contains as little as 0.04-0.06 ppb, (January 17, 2003, Lyondell Chemical Company, Product Safety Bulletin, Methyl Tertiary Butyl



MORDES

MTBE B.B.L.G.  
① ALL ② DSIL ✓  
③ ALL B.L.G.

# NATIONAL GROUND WATER ASSOCIATION

Presents

**The Southwest Focused Ground Water Conference:  
Discussing the Issue of MTBE and Perchlorate in  
Ground Water**

Co-sponsors:

- American Petroleum Institute
- California Groundwater Association
- Association of California Water Agencies
- Groundwater Resource Association of California
- Western States Petroleum Association



**June 3-4, 1998  
Anaheim, California**

## SCHEDULE

WEDNESDAY, JUNE 3, 1998

7:00 a.m. – 4:00 p.m.      Registration

### Presentation of Papers (*Medallion II & III*)

**Moderator**                      Tom Johnson, Levine • Frike • Recon

8:15 a.m. – 8:45 a.m.      California Water – Is It Safe?  
Walt Pettit, California Water Resources Control Board  
(keynote speaker)

8:45 a.m. – 9:10 a.m.      Oxygenate Use in Gasoline – When, What and Why—  
Lewis M. Gibbs

9:10 a.m. – 9:35 a.m.      Getting Reliable Data From Water Labs Testing for MTBE  
(or any other Volatile Contaminant—Bill Draper

9:35 a.m. – 10:00 a.m.      Evaluation of EPA & ASTM Methods for Analysis of  
Oxygenates in Gasoline Contaminated Groundwater—Rolf  
U. Halden, Sarah R. Schoen, Yakov Galperin, Issac R. Kaplan,  
Anne M. Happel

10:00 a.m. – 10:15 a.m.      REFRESHMENT BREAK  
Hosted by Levine • Frike • Recon

10:15 a.m. – 10:40 a.m.      Occurrence and Behavior of MTBE in Ground Water—  
Timothy E. Buscheck, Dan J. Gallagher, Tom R. Peargin,  
Donald L. Kuehne, Charles R. Zuspan

10:40 a.m. – 11:05 a.m.      Environmental Behavior and Fate of Methyl Tertiary Butyl  
Ether (MTBE)—Paul J. Squillace, James F. Pankow, John S.  
Zogoraki

11:05 a.m. – 11:30 a.m.      Fate and Transport of MTBE in Groundwater – Results of  
a Controlled Field Experiment in Light of Other  
Experience—James F. Barker, Mario Schirmer, Barbara J.  
Butler, Clinton D. Church

11:30 a.m. – 12:30 p.m.      LUNCH (on your own)

**Moderator**                      Seena Hoose, Santa Clara Water District

12:30 p.m. – 12:55 p.m.      Methyl Tertiary Butyl Ether Plume Evolution at California  
LUFT Sites—Edwin H. Beckenbach, Anne M. Happel

**WEDNESDAY, JUNE 3, 1998 (continued)**

- 12:55 p.m. – 1:20 p.m.      **Methyl Tertiary Butyl Ether (MTBE) Contamination of the City of Santa Monica Drinking Water Supply – An Update—Anthony Brown, J.R.C. Farrow, R.A. Rodriguez, B.J. Johnson**
- 1:20 p.m. – 1:45 p.m.      **Santa Clara Valley Water District's Leaking UST Oversight Program "MTBE Issues in Santa Clara County Ground Water Supplies"—James S. Crowley, Chris Tulloch**
- 1:45 p.m. – 2:10 p.m.      **Comparison of Alternative Technologies for Remediation of MTBE in Soil, Ground Water, and Surface—Michael Kavanaugh**
- 2:10 p.m. – 2:35 p.m.      **Mechanism and Efficiency of the Degradation of MTBE in Contaminated Groundwater by the UV/H<sub>2</sub>O<sub>2</sub> Process—James R. Bolton, Ali Safarzadeh-Amiri, Stephen R. Carter, Bertrand Dussert, Mihaela I. Stefan, John Mack**
- 2:35 p.m. – 2:50 p.m.      **REFRESHMENT BREAK**
- 2:50 p.m. – 3:15 p.m.      **Perspectives on MTBE Biodegradation and the Potential for In Situ Aquifer Bioremediation—Joseph P. Salanitro, Chi-Su Chou, Halina L. Wisniewski & Timothy E. Vipond**
- 3:15 p.m. – 3:40 p.m.      **MTBE Biodegradation in the Presence of Other Gasoline Components—Juana B. Eweis, Naoko Watanabe, Edward D. Schroeder, Daniel P.Y. Chang, Kate M. Schow**
- 3:40 p.m. – 4:05 p.m.      **Important Ecological Risk Assessment Parameters for MTBE and Other Gasoline Oxygenates—Eugene R. Mancini, W.A. Stubblefield, H. Tillquist**
- 4:05 p.m. – 4:30 p.m.      **Health Benefits Outweigh Health Risks—John Kneiss**
- 4:30 p.m. – 4:55 p.m.      **Public Health Implications of MTBE and Perchlorate In Water: Risk Management Decisions for Water Purveyors—James J.J. Clark, A. Brown, R.A. Rodriguez, B.J. Johnson**
- 4:55 p.m. – 5:20 p.m.      **A Basin Protection Strategy for Sites with MTBE Impacts—Kevin L. Graves, N. Scott MacLeod**
- 5:20 p.m. – 5:45 p.m.      **MTBE – The Need for A Balanced Perspective—Curtis C. Stanley**

**Conference Adjourns for the Day**



**THURSDAY, JUNE 4, 1998**

**7:30 a.m. – 2:00 p.m. Registration**

**Presentation of Papers (*Medallion II & III*)**

**Moderator Kevin Mayer, U.S. EPA**

**8:15 a.m. – 8:40 a.m. Growing Regulatory Awareness of MTBE & Perchlorate—Ken Williams**

**8:40 a.m. – 9:05 a.m. Potential Claims for Water Purveyors Impacted by MTBE or Perchlorate—Gregory J. Patterson**

**9:05 a.m. – 9:30 a.m. Perchlorate – A True Partnering Initiative—Major Dan Rogers**

**9:30 a.m. – 9:55 a.m. The Analysis for Perchlorate by Ion Chromatography: The California DHS Method—H.S. Okamoto, D.K. Rishi, S.K. Perera**

**9:55 a.m. – 10:10 a.m. REFRESHMENT BREAK**

**10:10 a.m. – 10:35 a.m. Perchlorate in Lake Mead—Kay Brothers**

**10:35 a.m. – 11:00 a.m. Dealing with Perchlorate Contamination in the San Gabriel Valley—Carol Williams**

**11:00 a.m. – 11:25 a.m. Biodegradation of Perchlorate in Ground Water—Michael Girard**

**11:25 a.m. – 11:50 a.m. The Biological Reduction of Perchlorate at Low Concentrations in Water – Technology Application in San Gabriel Basin, California—John G. Catts**

**11:50 a.m. – 1:20 p.m. LUNCH PROVIDED  
Senator Richard Mountjoy (speaker)**

**Moderator Jim Goodrich, San Gabriel Basin Water Quality Authority**

**1:20 p.m. – 1:45 p.m. Air Force Perchlorate Technology Program—Jim Hurley**

**1:45 p.m. – 2:10 p.m. Application of Ion Exchange Process for Perchlorate Removal—Issam Najm**

**2:10 p.m. – 2:35 p.m. Microbiological Treatment of Perchlorate Contaminated Ground Waters—Bruce E. Logan, Kijung Kim**

**THURSDAY, JUNE 4, 1998 (continued)**

- 2:35 p.m. – 3:00 p.m.      **Microbial Conversion of Perchlorate, Chlorate and Chlorite—CG van Ginkel, AGM Kroon, GB Rikken, SWM Kengen**
- 3:00 p.m. – 3:25 p.m.      **Treatment of Low Concentrations of Perchlorate, Status and Ongoing Research—Frank Blaha**
- 3:25 p.m. – 3:40 p.m.      **REFRESHMENT BREAK**
- 3:40 p.m. – 4:05 p.m.      **Human Health Risk Assessment of Perchlorate—Joan Dollarhide**
- 4:05 p.m. – 4:30 p.m.      **Exposure Concerns and Health Implications of Perchlorate—Marilyn Underwood**
- 4:30 p.m. – 4:55 p.m.      **Public Health Goals for California Drinking Water: Methyl Tertiary Butyl Ether (MTBE) and Perchlorate—Joseph P. Brown**
- 4:55 p.m. – 5:20 p.m.      **MTBE and Perchlorate in Drinking Water: Regulatory and Policy Issues—Michael Osinski**



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UCRL-AR-130897

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## **An Evaluation of MTBE Impacts to California Groundwater Resources**

### *Authors*

**Anne M. Happel  
Edwin H. Beckenbach\*  
Rolf U. Halden**

### **Report Submitted to the**

**California State Water Resources Control Board  
Underground Storage Tank Program**

**Department of Energy  
Office of Fossil Fuels**

**Western States Petroleum Association**

**June 11, 1998**

**\*University of California, Berkeley**

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**Environmental Protection Department  
Environmental Restoration Division**

FRESNO-MTBE-011404

- Variability in hydrologic parameters, such as high precipitation events, resulted in brief increases in MTBE concentrations in monitoring wells with low TPH-g impacts ( $< 1000 \mu\text{g L}^{-1}$ ). Spikes in MTBE concentrations were observed after the particularly wet winters of 1992/93 and 1994/95. These concentration surges are of particular concern because they suggest that periodic monitoring over limited time intervals may fail to detect the departure of significant amounts of oxygenate from the monitoring network. This may be especially important when evaluating the stability of an individual plume or when estimating mass migrating beyond downgradient monitoring wells.
- Reductions of benzene concentrations by as much as several orders of magnitude in the downgradient direction were observed within existing monitoring networks indicating significant attenuation of benzene at the majority of LUFT sites. By comparison, attenuation of MTBE appeared to be much more limited because concentration reductions generally did not exceed one order of magnitude. These results are consistent with the hypothesis that MTBE is generally recalcitrant and not likely to undergo the rapid attenuation seen for the more biodegradable BTEX compounds.

**In summary, the following conclusions are supported by our results:**

**1. MTBE is a frequent and widespread contaminant in shallow groundwater throughout California.** There are presently 32,409 LUFT sites recognized in the state, 13,278 at which hydrocarbons are known to have impacted groundwater. A minimum estimate of the number of MTBE-impacted sites in California is greater than 10,000.

**2. MTBE plumes are more mobile than BTEX plumes.** Although our results using 1995/96 data indicate that, at the majority of sites, individual MTBE plumes were nearly equivalent or shorter than their corresponding benzene plumes (defined by action levels of 20 and  $1 \mu\text{g L}^{-1}$  respectively), our results predict that at a portion of these sites this relationship will change over time as the contaminant plumes gradually dissociate.

**3. The primary attenuation mechanism for MTBE is dispersion.** Observed attenuation of BTEX and MTBE compounds at downgradient monitor wells suggests that MTBE is not significantly degrading in existing monitoring networks. Thus, MTBE may be regarded as recalcitrant under site-specific conditions. MTBE concentrations leaving these networks were greater than those of BTEX compounds at a significant portion of LUFT sites. Assuming resistance of MTBE to biodegradation, these plumes will eventually attenuate to regulatory concentration goals due to dispersion, although in contrast to BTEX compounds, the mass would not be depleted and significantly longer distances and time frames would be required.

**4. MTBE has the potential to impact regional groundwater resources and may present a cumulative contamination hazard.** To date, impacts of MTBE to public water systems have been limited and were similar in frequency to those of benzene. Based on historical



data, future impacts of aromatic hydrocarbons, such as benzene, to water supplies is not expected to be common, due to retardation and relative ease of biodegradation. In contrast, MTBE contamination may be a progressive problem due to the chemical's apparent recalcitrance and mobility. With a compound that appears both ubiquitous and recalcitrant, water resource management on the regional scale will become increasingly relevant. For example, the potential long-term accumulation of mass resulting from dispersion of MTBE plumes may be a key consideration for management of specific regional groundwater basins. Therefore, leak prevention is a critical requirement for the continued use of MTBE to ensure future protection of drinking water resources.

5. We have identified two major areas of uncertainty in our results. First, presently available MTBE data are limited. Second, the issue of recalcitrance of MTBE has not been resolved. Ideally, time-series data from hundreds of LUFT sites representing all hydrogeologic regions of California should be utilized to characterize the behavior and impact of MTBE plumes. Analyses of an expanded dataset are important to confirm our initial findings regarding the mobility and recalcitrance of MTBE at California LUFT sites. Further time-series analyses are necessary for predicting future MTBE impacts to groundwater resources, and assessing the vulnerability of drinking water resources.

A number of laboratory-cultured microorganisms isolated from various environments can degrade MTBE, yet there is no convincing evidence to date that this destructive process occurs quickly and/or commonly in the field. While future research is warranted to address these issues, it is appropriate to manage groundwater resources with the assumption that MTBE is both mobile and recalcitrant relative to benzene, until proven otherwise.

## References

- Squillace, P.J.; Zogorski, J.S.; Wilber, W.G.; Price, C.V. *Environ. Sci. Tech.*, 30(5), 1721-1730, 1996.
- Rice, D.W.; Gröse, R.D.; Michaelson, J.C.; Doohar, B.P.; MacQueen, D.H.; Cullen, S.J.; Kastenberg, W.E.; Everett, L.E.; Marino, M.A. *California Leaking Underground Fuel Tank (LUFT) Historical Case Analyses*; UCRL-AR-122207; Lawrence Livermore National Laboratory: Livermore, CA, 1995.
- Mace, R.E., R.S. Fisher, D.M. Welch, and S.P. Parra. *Extent, Mass, and Duration of Hydrocarbon Plumes from Leaking Petroleum Storage Tank Sites in Texas*; Bureau of Economic Geology, University of Texas at Austin, Austin, Texas, 1997.
- Doohar, B.P. *Making Risk-Based Management Decisions at Fuel Hydrocarbon Impacted Sites Under Sparse Data Conditions*; Ph.D. Dissertation, University of California at Los Angeles, March, 1998.