Expert Report
of
Lorne G. Everett, PhD, DSc

L. Everett & Associates, LLC

In the matter of:

Kathleen McHugh and Deanna Schneider, et al.

v.

Madison-Kipp Corporation, et al.

December 3, 2012

Expert Report
of
Lorne G. Everett, PhD, DSc.

L. Everett & Associates, LLC.

In the matter of:

Kathleen McHugh and Deanna Schneider, et al.

v.

Madison-Kipp Corporation, et al.

I declare under penalty of perjury that the following is true and correct, to the best of my information and belief. Executed on December 3, 2012 at Santa Barbara, California.

Lorne G. Everett, PhD, DSc.
L. Everett & Associates, LLC

Section 1. Introduction

I have been retained by the law firms of Varga Berger Ledsky Hayes & Casey and The Collins Law Firm on behalf of Kathleen McHugh and Deanna Schneider, et al. to provide scientific input and expert opinions concerning soil, soil gas, groundwater and vapor/air contamination in and around the Madison-Kipp facility in Madison, Wisconsin.

In this report, I have described my opinions and the bases for these opinions. I have relied upon my education and experience in environmental science and hydrology to form my opinions in this expert report. I have also relied upon data and documents that were prepared by others concerning the site and the neighborhood. The documents relied upon include those listed in Section 3 of this report and were reviewed by myself or other staff at L. Everett & Associates, under my direction. In addition to those documents explicitly referenced in this report, we have also reviewed deposition transcripts and thousands of pages of documents included in DNR's state electronic document repository for cleanup sites. Further, I have relied upon reference texts accepted and held reliable by experts in the fields of environmental science, environmental engineering, and hydrogeology as well as generally-accepted principles in those fields. I have also personally inspected the Madison-Kipp facility and the neighboring Class Area. If additional relevant information becomes available, I reserve the right to revise my opinions. I may also provide supplemental opinions regarding this case, if requested. In addition to the exhibits included herein, figures, tables and maps included in references cited in this report may be used as trial exhibits. References to evidence in the form of testimony or documents or data are not meant to be exhaustive but rather exemplary. There are other documents and data in the voluminous case file that also support the opinions offered herein. The opinions described in this report are made to a reasonable degree of scientific certainty.

Background and Qualifications for Lorne G. Everett

I, Lorne G. Everett, Ph.D., DSc., PH, PH-GW, CGWP wrote this Expert Report in the matter of Kathleen McHugh, and Deanna Schneider et al v. Madison-Kipp et al. I have personal knowledge of the matters stated herein. If called as a witness, I could and would competently testify to the matters set forth in this report. Currently, I am Chief Scientist and CEO of L. Everett & Associates, LLC.

I have been retained to provide opinions relative to the distribution of PCE, PCB, PAHs and other volatile organic compounds (VOCs) in soil, soil gas, groundwater and vapor/air, vadose zone contaminant behavior, groundwater hydrology, hydrogeology, environmental investigations, site characterization and remediation.

I am a retired Research Professor/Hydrologist (Level VII) in the Donald Bren School of Environmental Science and Management at the University of California at Santa Barbara. The University of California has reserved Level VII for “scholars of great distinction.”

I am a Fellow of the American Society of Civil Engineers (ASCE), a Fellow of the American Water Resources Association (AWRA), and a Fellow of the American Society for Testing and Materials (ASTM). The Title Fellow recognizes the highest earned honor bestowed by a Professional society.

I have a Ph.D. in hydrology (1972) from the University of Arizona. I am a registered hydrologist, #164, and a registered hydrogeologist #836, with the American Institute of Hydrology. I have served on the Board of Registration for the American Institute of Hydrology. I am a Certified Groundwater Professional, #293, by the American Association of Groundwater Scientists and Engineers. Lastly, I am a former Registered Environmental Assessor II, by the California Environmental Protection Agency, Department of Toxic Substances Control. DTSC declared that the REA II registration was the highest environmental registration recognized in the State of California.

I am the Past Director of the Vadose Zone (Soils) Monitoring Laboratory at the University of California. For over 15 years I directed leading edge research on liquid and gaseous migration in both the saturated and unsaturated (vadose) zone.

For 18 years I have been the Charter D18.21.02 Chairman of the American Society for Testing and Materials (ASTM) task committee on Vadose Zone Monitoring. I was a centennial member of the ASTM Board of Directors and received the ASTM, Award of Merit, the highest honor bestowed by the society for writing National Groundwater and Vadose Zone Standards. As chairman of ASTM's Vadose Zone Task Committee, I was responsible for developing all of the current national ASTM D18.21.02 Vadose Zone standards. I have received ASTM Standards Development Awards including the award for Comparison of Field Methods for Determining Hydraulic Conductivity and the Standards Development Award for the Standard Guide for Pore-Liquid Sampling. I received the A. Ivan Johnson Outstanding Achievement Award in 1997 for “Outstanding and Significant Contributions” to the hydrogeologic understanding of soil and rock.

Of direct relevance to soil gas sampling and vapor intrusion issues in this case, I Chair the ASTM committee (D18.21.02) which developed the following soil gas monitoring national standards:

- D5314-92 (2006) Standard Guide for Soil Gas Monitoring in the Vadose Zone
- D7758 (2011) Practice For Passive Soil Gas Sampling in the Vadose Zone for Source Identification, Spatial Variability Assessment, Monitoring, and Vapor Intrusion Evaluations
- D7648 (2012) Practice For Active Soil Gas Sampling for Direct Push or Manual-Driven Hand-Sampling Equipment
- D7663 (2012) Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluations

Further on January 30, 2013, I will chair an international ASTM symposium entitled: Continuous Soil Gas Measurements: Worst-Case Risk Parameters. This symposium is directly related to the vapor intrusion issues in this case.

In 1996, I received a Doctor of Science Degree (Honoris Causa) from Lakehead University in Canada for Distinguished Achievements in Hydrology. In 2002 I received the C. V. Theis Award, the highest award given by the American Institute of Hydrology (AIH) for major contributions to groundwater hydrology.

I have authored, edited, and contributed chapters to over 12 books, published over 150 professional papers and reports, hold several patents, and developed numerous standards on the subject of groundwater and vadose zone characterization and remediation. My book entitled “Groundwater Monitoring” was endorsed by the EPA as “establishing the State of the Art used by industry today” and was recommended by the World Health Organization for all developing countries. I was an invited Charter member of the Editorial Board of the journal, Environmental Forensics, a quarterly peer-reviewed scientific journal of national and international circulation. In this role, I evaluated the work of others through peer-review of manuscripts submitted for publication to the journal. I also participated in publication decisions, as well as establishing and maintaining the editorial direction of the journal.

For my contributions to the science of hydrogeology I was elected (No. 300-H3) to the Russian Academy of Natural Sciences. Based upon my original contributions to the science of hydrogeology, I received the Russian Academy's highest honor entitled the “Kapitsa Gold Medal”. The Medal was presented by the Head of the Russian Academy’s Water Problems Institute, on October 29, 1999 at the Beau Rivage Palace in Lausanne, Switzerland in front of an audience Chaired by Nobel Laureates.

My book entitled “Subsurface Migration of Hazardous Waste” is widely used in contamination investigations. With the Russian Academy, I was the English editor of a 2002 book entitled Groundwater

and the Environment-Applications for the Global Community. My book entitled "Vadose Zone Monitoring for Hazardous Waste Sites" has been sold out. My book entitled, "Handbook of Vadose Zone Characterization and Monitoring" has been deemed a best seller by Lewis Publishers. As a tribute, the United States Department of Energy (DOE) in 1999, asked me to endorse their book entitled "Vadose Zone Science and Technology Solutions. DOE further asked me to frame the research needs of the book and to write the Foreword (I), Forward (II) was written by Dr Paul A. Witherspoon, UC Berkeley. My endorsement appears on the back cover of the 1540 page, two-volume book.

Based upon my many years of experience, I have participated on the Executive Committee of the United States Department of Energy's DOE Complex Wide Vadose Zone Science and Technology Roadmap.

As a further part of my contributions to federal agencies, I was a charter member of the Science Advisory Board of the United States Department of Defense (DOD) National Environmental Technology Test Site. For my contributions to the science advisory board on petroleum characterization and remediation, I received the United States Navy's Medal of Excellence in October, 1999.

I am a member of the Lawrence Livermore National Laboratory “peer review” team (led by a member of the National Academy of Sciences) for the LLNL investigation entitled: “Historical Case Analysis for Chlorinated Volatile Organic Compound Plumes”. This was the largest data-base on chlorinated hydrocarbons, ever assembled and analyzed.

I am a co- author of the Lawrence Livermore National Laboratory reports entitled; “California Leaking Underwater Fuel Tank (LUFT) Historical Case Analysis” and “Recommendations to Improve the Cleanup Process for California’s Leaking Underground Fuel Tanks”. This was the largest analysis of petroleum hydrocarbon migration characteristics that has ever been undertaken.

I am on the EPA/DOE/DOD/NASA Technical Advisory Board for the national evaluation of DNAPL chlorinated hydrocarbon cleanup technologies held at Launch Complex 34 at the NASA Kennedy Space Center. The most promising 10 DNAPL chlorinated hydrocarbon remediation technologies were evaluated for effectiveness and costs and 3 were demonstrated at Complex 34.

I was on the US Navy “Gatekeeper Review Panel” which evaluated the latest research on chlorinated hydrocarbon characterization and remediation.

At the request of UNESCO in Paris, I was the English editor of a Monograph entitled Groundwater Resources of the World and Their Use. The Monograph published in 2004 looks at drinking water issues

throughout the World and was distributed by UNESCO to every water resources research centre in the World. The US National Association of Groundwater Scientists and Engineers published a second printing of the book in 2006. The book was translated into Russian and reprinted by the Russian Academy of Sciences in 2007.

On behalf of EPA/DOE/DuPont I co edited a State of the Art book entitled: Barrier Systems for Environmental Contaminant Containment and Treatment that was released in 2006 by CRC press.

For the past 24 years I have been continuously invited by Dr Antonio Zichichi, a Science Advisor to the Pope, to participate in Planetary Emergency meetings held in southern Italy wherein I am the Chairman of the World Federation of Scientists Pollution Panel. In the fall a second meeting is often held at the Pontifical Academy of Sciences in the Vatican.

For over three decades I have been involved in consulting and advising the US Department of Energy on environmental issues. I have peer reviewed, visited, consulted, lectured, and been an advisor at the following DOE sites: Lawrence Livermore National Laboratory, Hanford Washington, Rocky Flats Colorado, Idaho National Engineering Laboratory, Fernald Ohio, Paducah, Kentucky, Savannah River, Argonne National Laboratory and DOE Headquarters in Washington DC. I have been on DOE Roadmap committees as a member and Executive reviewer. I have been a DOE trainer and author of DOE supported environmental documents.

I have given mock trial training programs to environmental lawyers at the invitation of Carmen Trutanich Esq., the current Los Angeles City Attorney.

From 2000 -2009 I was the Chancellor of Lakehead University in Thunder Bay, Ontario, Canada. For my contributions to Canada, I received the Gold Medal from the Governors General of Canada in 2002.

I have given invited court room training to the Environmental Protection Agency, Criminal Investigation Division. My Criminal Investigation Division award states: “For your invaluable support and notable contribution to the mission of the Criminal Investigation Division”.

A complete copy of my resume is provided as Attachment A of this report. I have relied upon my education and experience in environmental science and hydrology and my experience in soil moisture migration and vadose zone monitoring to form my opinions in this expert report. I have also relied upon data and documents that were prepared by others concerning the area in discussion. I reserve the right to

supplement or modify this report and my opinions to respond to any new or additional information that may become available after the date of this report.

For preparing this report, L. Everett & Associates invoices my time at the rate of $400/hr. For deposition and trial testimony my hourly rate is $800. My opinions are summarized below and discussed in more detail in Section 2 of this Expert Report.

Summary of Opinions

This is a case in which hazardous waste disposal and chemical handling practices at an industrial facility in Madison, Wisconsin have caused soil, soil gas, groundwater and vapor/air contamination with harmful chemicals. The contamination has migrated on the ground surface and in the subsurface and now extends throughout the Class Area and beyond. Some of the contaminants are a class of chemicals called volatile organic compounds (VOCs). These chemicals volatilize from the soil and groundwater. The contaminated soil gas then migrates upward and infiltrates overlying structures causing contamination of indoor air. Further, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and metals are extensively found both onsite and in the neighboring Class Area yards. While much of this contamination resulted from dumping and spills which occurred several decades ago, meaningful investigation of the extent of the contamination has been undertaken only within the last year. Those remedial activities that have been conducted to date have been ineffective at removing, or have simply neglected to remove, Madison-Kipp's contaminants both from its property and from the neighboring properties of the Class Area. Residents of the Class Area have already been exposed to Madison-Kipp's toxic chemicals for decades; the net result of the delays and flaws in the environmental program is that the residents face many more years, if not decades, of potential exposure.

Madison-Kipp has been releasing toxic chemicals for decades and (considering the contaminant transport mechanisms associated with this site) the migration of chemicals into the Class Area would have begun shortly after commencement of the releases. For example, contaminants spread by wind-blown transport and run-off would have migrated offsite as soon after the commencement of dumping as the first major rainstorm or windy day. Soil vapor migration from VOC-contaminated onsite soil would have reached the immediately adjacent homes in a matter of weeks or months. Considering an approximate shallow

groundwater flow velocity of 40 of feet per year[1], contaminated groundwater would have extended off-site within (at most) a year or two of first becoming impacted.

The historical record and testimony of Madison-Kipp employees shows that the company's initial strategy was to deny it had a problem and seek to redirect the blame to others. As the years went by and the fallacy of this message became more and more obvious, Madison-Kipp's strategy changed and it embraced a message for public consumption that its environmental problems were not serious. This message was also false, as the environmental testing, particularly within the last year, has proven the serious nature of the surface and subsurface contamination at this site and in the surrounding neighborhood.

I am providing the following opinions regarding environmental conditions at and near the Madison-Kipp Site. Section 2 of this report provides supporting information and the bases for these opinions. These opinions are reinforcing of one another. Documents, data and supporting evidence cited in one opinion are generally also relevant to others and are hereby incorporated.

Opinion 1. Chemical releases from Madison-Kipp are the source of the soil, soil gas, groundwater and vapor/air contamination in the Class Area and beyond.

Opinion 2. Madison-Kipp violated applicable standards of conduct in its handling, disposal and releases of hazardous chemicals.

Opinion 3. Madison-Kipp violated applicable standards of conduct in its failure to promptly and thoroughly investigate and remediate the contamination and protect the people and environment threatened by it.

Opinion 4. The soil, soil gas, groundwater and vapor/air contamination at and released from this Site and into the Class Area constitute an imminent and substantial endangerment to human health and the environment within the meaning of the Resource Conservation and Recovery Act (RCRA). The imminent and substantial endangerment will persist indefinitely unless effective remedial actions are implemented.

Opinion 5. Because Madison-Kipp has no comprehensive plan to complete the investigation or to clean up the contamination, and has failed to confront the complexity and challenges of remediating the

[1] This estimate is based on an average hydraulic conductivity of 7 ft/day and porosity of 20% (Ruekert/Mielke, 2011 on behalf of Madison Water Utility) and average gradient of 0.003 (RJN Environmental Services, 2011, Annual Report).

widespread contamination it has caused, additional remedial measures are required to characterize the site and mitigate the imminent and substantial endangerment to human health and the environment.

I have considered multiple lines of evidence in my approach to this matter as is accepted environmental practice. Further, I have personally documented conditions outside of the Madison–Kipp facility in Pictures 1 thru 36 in this report.

Site Location and Description

Madison-Kipp, the "Site" is located at 201 Waubesa Street in Madison, Wisconsin. The location of the Site is illustrated on a topographic quadrangle presented as Exhibit 1. The Site is approximately 7.5 acres in size. The site was first developed for metal casting in the late 1800's and Madison-Kipp has operated a metals casting facility at the Site for many decades. The property consists of a 130,000-square foot building (which occupies much of the Site), surrounded by asphalt parking lots to the northeast, southwest and southeast of the main building. The building has a 25,000-square foot second floor and a 25,000-square foot basement. Exhibit 2 depicts the layout of the Site.

Although the Site is zoned M-1 (industrial/manufacturing), it is located in a mixed use area of commercial, industrial and residential land use of eastern Madison. The Site is bounded by a bicycle trail (Capital City Trail) to the north, Atwood Avenue to the south, Waubesa Street to the west and Marquette Street to the east. Residences are located directly adjacent to the Site on the east and west sides, and residences are also located further west (across Waubesa Street) and east (across Marquette Street). Commercial properties are located to the south (across Atwood Street) and further east. The Goodman Community Center is located to the north (across the Capital Trail).

The Site is situated at the northeast end of the Madison isthmus, approximately 1,500 feet north of Lake Monona and approximately 6,800 feet east of Lake Mendota. The topography of the Site is relatively flat, with an elevation ranging from approximately 870 to 880 feet above mean sea level. The Site and surrounding area is serviced by municipal water supply and sewage systems.

Hydrogeologic Conditions

The Madison area lies in a part of Wisconsin underlain by a thick sequence of Paleozoic sedimentary rock that was deeply eroded during Pleistocene glaciations. In the vicinity of the Site, the bedrock surface lies beneath approximately 35 feet of unconsolidated glacial sediments. Clayton and Attig (1997) have mapped the glacial sediments in the area as a patchwork of glacial lake sediments (e.g. stratified sand, silt and clay) and till (much denser and poorly sorted gravelly, clayey silty sand). Soil borings completed at

the Site describe the unconsolidated zone as a fining-upward sequence consistent with lake sediments. The typical unconsolidated stratigraphy includes:

- A veneer of surficial fill, generally less than 5 feet thick.
- Clay or silty clay, from approximately 5 to between 10 and 15 feet below ground surface.
- Sand, from approximately 10 feet to the top of rock at approximatley 35 feet. The sand is typically fine-grained and variably silty, with occasional gravel beds, particularly in the bottom half of the unit.

While the sedimentary bedrock in the Madison area is nearly flat-lying, the bedrock surface was deeply eroded by glaciers. Lakes Mendota and Monona, located to the north and south of the Site, respectively, occupy deep glacial valleys that were scoured at least 200 feet into the bedrock (Bradbury and others, 1999)

The Site vicinity is underlain by approximately 750 feet of Cambrian-aged sandstone, shale and dolomite. The expected stratigraphy at the Site is as follows (Ruekert/Mielke, 2011).

Estimated Depth	Formation/Group	Description
35-120 feet	Tunnel City Group	Poorly to moderately-well cemented fine-to-medium sandstone, often Glauconitic (containing green/blue sand-sized clay nodules).
120-245 feet	Wonewoc Formation	Medium to fine-grained sandstone
245-430 feet	Eau Claire Formation	The upper part of contains significant shale and siltstone. Deeper, the unit is chiefly dolomitic sandstone
430-750 feet	Mount Simon Formation	Well-cemented, coarse to medium-grain sandstone

The hydrostratigraphy of the area is typically divided into four units:

- **Unconsolidated Zone (Upper Unconsolidated Aquifer)**, the zone of saturated glacial sediments overlying bedrock. In the vicinity of Madison-Kipp, this zone is discontinuous. The zone of saturation is thin to absent in the southern part of the Site (e.g., the water table is at or below the rock surface), to between 10 and 15 feet thick in the north of the Site. Typically, only the sandy portion of the unconsolidated zone is saturated, while the shallow clay is above the water table.

- **Upper Paleozoic Aquifer (Upper Bedrock Aquifer)**, encompassing the Tunnel City Group and Wonewoc Formation (approximately 210 feet total thickness). The unit is not used extensively for water supply, but is moderately permeable, with a hydraulic conductivity estimated at approximately 5 feet per day (Ruekert/Mielke, 2011).
- **Eau Claire Aquitard,** defined as the thin shaley facies found near the top of the Eau Claire Formation. Where present, this unit functions as an aquitard separating the Upper Paleozoic Aquifer from the Mt. Simon Aquifer below. The Eau Claire is present in the immediate Site vicinity, but is eroded in the glacial bedrock valleys beneath Lakes Monona and Mendota.
- **Mount Simon Aquifer (Lower Bedrock Aquifer),** defined as the Mount Simon and Eau Claire Formations, starting below the Eau Claire Aquitard (approximately 500 feet total thickness). The Mt. Simon Aquifer supplies the main water-supply wells. The mean hydraulic conductivity of the aquifer is estimated at approximately 10 feet per day (Bradbury and others, 1999).

Though the sandstone aquifers have moderate porosity (typically 10-20 percent), the groundwater flow occurs predominately in fractures such as bedding planes and joints. The porous matrix of the sandstone creates a secondary permeability, and provides a significant volume of storage.

The water table at the Site generally ranges between 15 and 35 feet below ground surface. Previous reports have shown shallow groundwater flow trending to the east and south; flow in the bedrock appeared to trend south, but has shown more variability than in the upper zones. Based on the groundwater levels measured from nested monitoring wells, there is a vertical gradient suggesting groundwater from the Site includes a downward flow component The PCB and PAH contamination would be found mostly in the veneer of surficial soil, thus is not likely impacting groundwater. PCE is found in shallow groundwater (in MW-5D, for example) in the Tunnel City Group. However, PCE has been detected as deep as 229.5 feet below ground surface at MW-3, which shows that the contamination extends into the underlying Wonewoc Formation.

Section 2. Expert Opinions

OPINION 1. Chemical releases from Madison-Kipp are the source of the soil, soil gas, groundwater and vapor/air contamination in the Class Area and beyond.

Environmental testing at the Site demonstrates extensive contamination of soil, soil gas, groundwater and vapor/air in and around the Madison-Kipp Site with a myriad of what are known today as "hazardous wastes,"[2] including chlorinated volatile organic compounds, PAHs, metals and PCBs. These are "hazardous wastes" within the meaning of the federal law known as the Resource Conservation and Recovery Act (RCRA)[3]. To date, the most abundant chemical found in the subsurface is tetrachloroethene (PCE) a chlorinated solvent commonly used as an industrial degreaser. That Madison-Kipp is the source of this contamination on its site and in the surrounding Class Area is not subject to reasonable scientific dispute. The soil, soil gas and groundwater on company property is pervasively contaminated, and is literally just feet away from Class Area homes. As acknowledged by Madison-Kipp's environmental consultant, there are no other industrial operations in the Class Area that could be likely alternative sources of the PCE vapors (Trask Deposition, 2012, p. 158). After initial denials, Madison-Kipp and its consultants subsequently acknowledged this fact. Mr. Schmoller, the Project Manager for the State of Wisconsin Department of Natural Resources (WDNR) on the Madison-Kipp site, confirmed in his deposition that there is widespread PCE soil contamination at the Madison-Kipp site (Schmoller Deposition, 2012, pp. 105-106). Mr. Schmoller also confirmed that Madison-Kipp is the source of vapor contamination on Class Area properties when he stated that the source of vapors found at properties directly adjacent to the facility is Madison-Kipp (Schmoller Deposition, 2012, pp. 32-33).

The principal contaminant now invading the immediately adjacent Class Area, PCE, was first dumped and spilled on the Madison-Kipp property decades ago, as explained in this report. As there was no clean-up of the PCE, it was allowed to migrate through the soil layers, ultimately contaminating at least two subsurface groundwater aquifers which transport contamination into the Class Area.

[2] 42 USC §6903(5).
[3] 42 USC §6901, et sec.

The contaminated groundwater which then migrated from the Madison-Kipp site and spread throughout the Class Area contains PCE concentrations as high as 4,600 ug/l. This contaminated groundwater then contaminated the soil, soil vapor and air above it (including air beneath and inside homes) in the Class Area in two basic ways. First, fine-grained sediments cause the contaminated groundwater to "wick up," similar to an ink blotter wicking up ink, and by this method contamination moves from the water table to the soil underneath and surrounding the homes. Second, because the toxic chemicals in the groundwater evaporate (called "volatilization"), they move upward in a gaseous state through the soil and into the air above it. Some of the PCE now being found in vapor under neighborhood homes migrates laterally through the soil from the highly contaminated soil on Madison-Kipp property and some migrates vertically from underlying VOC-contaminated groundwater. This soil vapor contamination can seep through cracks and utility penetrations in floors and basements, resulting in the introduction of contaminated air into homes. Contamination also spreads into surficial soil by windblown dust, exhaust fallout and by sediment transport during rain and flooding events. The PAH, PCB and metal contamination spreads away from the Madison-Kipp property primarily by these methods. The PAHs, PCBs and metals now being found in neighbors' soil has migrated from the highly contaminated soil on Madison-Kipp property and/or has been discharged directly from Madison-Kipp's vents and stacks and contaminated particulate matter subsequently settled out of the air onto the neighbors' yards.

The contamination was ignored for many years after it was first dumped, spilled, etc. In 1994, it was identified to Madison-Kipp by WDNR. Subsequent investigations conducted years later – although far later than they should have been – have confirmed that the contamination has spread offsite onto neighboring residential properties. As shown on Exhibits 3-9, there is widespread contamination that extends offsite an undetermined distance to the north, south, east and west. Vapors emanating from the contaminated soil and groundwater have migrated onto neighboring properties. This situation poses enough of a concern to human health that WDNR is using taxpayer money to install subslab depressurization systems in Class Area homes in an attempt to protect residents from Madison-Kipp's chemicals.

The Wisconsin Department of Justice on September 28, 2012 filed a lawsuit against Madison-Kipp, alleging violations of the Wisconsin State hazardous spill laws for failing to report the discovery of hazardous wastes and the disposal of hazardous wastes, and for failing to investigate and clean up the resulting contamination. The lawsuit specifies that PCE and PCB's from Madison-Kipp have contaminated the soil, soil gas and groundwater onsite and offsite. No other potential source of the contamination has been identified.

Madison-Kipp used PCE and discharged it to the environment for many years. The September 2012 deposition of former Madison-Kipp employee James Lenz provides insight into the use and disposal of PCE at the Madison-Kipp facility. Mr. Lenz worked at the Madison-Kipp Corporation from late June 1980 to June 2011, initially as a Senior Manufacturing Engineer (Lenz Deposition, 2012, pp. 8-9). Between approximately 1988 and 2006, Mr. Lenz served as the Facility Engineer at Madison-Kipp (Lenz Deposition, 2012, p. 11). In approximately 1996, he was also given responsibility for environmental engineering at the facility. Thus, from approximately 1996 to 2006, Mr. Lenz was the plant engineering and environmental manager (Lenz Deposition, 2012, p. 17).

Since Mr. Lenz had been at Madison-Kipp, the facility had two divisions, the Lubricator Division which operated out of the Waubesa end of the building and the Die Casting division which operated out of the Atwood end of the building (Lenz Deposition, 2012, p. 34). Mr. Lenz indicated that both divisions used PCE for cleaning parts at one time or another (Lenz Deposition, 2012, p. 34).

Mr. Lenz summarized Madison-Kipp's past attitude regarding disposal of liquid waste, including PCE:

> Mr. Lenz: "You just throw it wherever the closest place to throw it."
> Q: Throw what?
> A: whatever you want to get rid of.
> Q: Including PCE?
> A: Yes.
> Q: That was the attitude at the time?
> A: Yes.
> Q: Is throw it wherever?
> A: Yes. (Lenz Deposition, 2012, pp. 72-73).

Madison-Kipp used PCE in vapor degreasers and to clean tools

The PCE which Mr. Lenz says was "thrown wherever" was used by Madison-Kipp in a vapor degreaser to clean parts in the post-manufacturing process (Lenz Deposition, 2012, p. 37). The vapor degreaser was used at different times by both divisions. Mr. Lenz recalled that, in 1983 or 1984, the Die Casting Division transferred the vapor degreaser to the Lubricator Division. Mr. Lenz indicated (Lenz Deposition, 2012, p. 35) that the vapor degreaser was physically moved from one position to the other. The Lubricator Division used the vapor degreaser from that time until it was sold in 1992 (Lenz Deposition, 2012, pp. 34-36).

Mr. Lenz indicated that the parts to be cleaned in the degreaser were put in wire baskets. The baskets were then picked up with a small hoist and set above the open tank wherein heated PCE vapors would condense on the cold parts and drip off thereby cleaning the parts of any residual oil. The vapor degreaser consisted of an 8-foot tall tank that sat on the floor with dimensions of approximately 6-feet by 4-feet. There was a hood on the top that had a duct and a fan that blew the vapors outside (Lenz Deposition, 2012, p. 38). Mr. Lenz confirmed that PCE vapors from the degreaser were simply vented to the atmosphere (Lenz Deposition, 2012, p. 38).

The vapor degreaser contained 75 to 100 gallons of PCE. When it needed to be refilled, employees filled 5-6 gallon buckets from an above-ground storage tank and hand-carried the buckets back to the degreaser (Lenz Deposition, 2012, pp. 39-41).

In addition to being used in the degreaser, Mr. Lenz indicated that PCE was a common cleaning agent that was used at the plant to clean parts or tools, and sometimes it was used with a brush to simply clean machines. Mr. Lenz indicated that the die cast operators would fill a bucket with a few inches of PCE and use the solvent to clean their machines.

Madison-Kipp stored PCE on site

The PCE storage tank for the Die Cast Division was located in the oil shed and the PCE storage tank for the Lubricator Division was located in a small notch on the east side of the building. Each tank had a capacity of approximately 250 gallons (Lenz Deposition, 2012, p. 42). The PCE storage tank was simply filled from a truck with a nozzle similar to how a fuel company delivers fuel oil (Lenz Deposition, 2012, p. 43). PCE was observed to spill onto the ground during refilling of the PCE tank (Lenz Deposition, pp. 44-45). PCE was dispensed from the tank into a bucket via a spigot or valve on the bottom of the tank (Lenz Deposition, 2012, p. 67). PCE was observed to spill onto the ground during dispensing of PCE into buckets. There was at least one occasion in which a leak in the Lubricator Division PCE storage tank caused releases to the environment (Lenz Deposition, 2012, p. 68). Based upon environmental testing data I have reviewed which show high concentrations of PCE at the Site, there were obviously significant losses of PCE to the environment related to operation of the PCE storage tanks.

There were floor drains at Madison-Kipp that would allow spilled liquids to be released from the building. The closest drain to the vapor degreaser when it was used by the Die Cast Division was 50 or 60 feet away (Lenz Deposition, pp. 64-65). This drain is allegedly connected to the sanitary sewer. There was also a floor drain near the PCE storage tank used by the Lubricator Division, which simply discharged onto a grassy area outside the building (Lenz Deposition, 2012, p. 68).

Both PCE storage tanks were situated on concrete pads located outside the plant building, but there was no secondary containment around the tanks that might have contained spills or leaks:

> Q: "So the lubricator division concrete pad had a -- had some sort of drain in it?"
>
> A: It sloped down to a grassy area.
>
> Q: OK, so if anything was spilled on that concrete pad and allowed to roll or to wash off, it would--and it rolled or washed off in the direction of the slope, it would go to the grass?
>
> A: Correct (Lenz Deposition, 2012, p. 69).

WDNR confirmed that there were reported releases of PCE from the storage tanks:

> A. There was an aboveground AST that stored PCE in the northeast portion of the site, and there was a leak that occurred from -- a leak or a spill that occurred from that tank, ran down along the eastern -- north along the eastern side of the building.
>
> Q. Are we talking about a single event, at least according to your understanding? You said a leak or a spill. Are you talking about a single event?
>
> A. I think there's a known single event. I don't know -- I don't think it's reported that it happened repeatedly.
>
> Q. And this was PCE?
>
> A. Yes.
>
> Q. From the aboveground storage tank?
>
> A. Yes.
>
> Q. Which is located approximately where?
>
> A It would be towards the northern portion of the building. To best describe it, if you look at the northern extension of the building, there's an area on the east side of the building where there's an indentation.
>
> Q. Yeah.
>
> A. The tank was in that indentation area.
>
> Q. And for this single event, when did this event occur, this PCE leak or spill from the aboveground storage tank?
>
> A. That I don't recall.
>
> Q. Do you know a decade?
>
> A. '70's or '80's.
>
> Q. How much was spilled or leaked, do you know?
>
> A. No (Schmoller Deposition, 2012, pp. 280-281).

Madison-Kipp spilled and dumped PCE both inside and outside the building

Madison-Kipp has a long history of reckless chemical handling and disposal practices. For example, Mr. Lenz stated:

> Mr. Lenz: "Back then there were spills all the time and they weren't worried about."
>
> Q: When you say back then, what do you mean?
>
> A: Early 80's
>
> Q: Okay. So your understanding is that in the early 1980's there were PCE spills all the time, right?
>
> A: That's what I heard from other people.

Mr. Lenz went on to explain that he had come to this understanding from a number of Madison-Kipp employees including George Schler, Wally Largen, and Merv Jelings. The types of spills included PCE sloshing out of a bucket and spilling onto the floor as well as spills when dispensing PCE from the storage tanks. In addition to incidental releases during operation of the PCE storage tanks and the vapor degreasers, Madison-Kipp also purposefully dumped used PCE onto the ground:

> Mr. Lenz: "Back before the parking lot was paved they would just throw buckets of it out the parking lot to get rid of it."
>
> Q: Who - who threw the buckets of PCE out onto the --the area which became the parking lot?
>
> A: People that were cleaning the machine.
>
> Q: What machine?
>
> A: The vapor degreaser.
>
> Q: OK. And now this was spent PCE?
>
> A: Yeah dirty ---
>
> Q: So this is PCE laying, if you will, at the bottom of the degreaser?
>
> A: Yes.
>
> Q: So what you were told was that -- that people at the plant would scoop buckets of spent PCE out of the bottom of the vapor degreaser and pour it outside, right?
>
> A: Correct---
>
> Q: What were you told about where they were poured?
>
> A: Right out the door next to the vapor degreaser. –
>
> Q: Out onto the ground, correct?
>
> A: Correct.
>
> Q: And it's now a parking lot?

A: It's a driveway more than a parking lot there. (Lenz Deposition, 2012, p. 46).

The first PCE contamination discovered was a narrow strip of impacted soil along the building which is exactly where Mr. Lenz indicated that waste PCE was purposefully dumped when employees serviced the vapor degreaser. Further:

Q: Okay. All right. So the general knowledge around the plant was that operators of the vapor degreaser would scoop the spent PCE out of the bottom of the vapor degreaser and walk it outside a door and dump it on the ground outside the building, correct?

A: Correct. –

Q: All right. And this was, according to the general understanding around the plant, this was multiple operators of the vapor degreaser; perhaps 10 or 20, correct?

A: Correct.

Q: All right. And it was general understanding around the plant that this had gone on for some number of years, correct?

A: Correct. (Lenz Deposition, 2012, p. 53).

Mr. Lenz described yet another means by which PCE and other chemicals were intentionally released onto the ground outside the plant. "My understanding was that they just had a tank that they would dump everything into, and they would go out and spread it on the gravel in the parking lot to keep the dust down." This routine dumping apparently included not just PCE but also PCB-bearing hydraulic oil, lubricating oil and other chemicals at the company. In addition to eliminating costs associated with waste disposal, dumping of chemicals onto the ground also allowed Madison-Kipp to accomplish dust control around its facility (Lenz Deposition, 2012, p. 71). Mr. Lenz was asked if there was any reason other than to keep the dust down that these waste oils were spread on the ground and he responded affirmatively that this was just another mechanism by which they were disposing of their wastes.

After around 1988, Madison-Kipp's waste PCE was stored in a tank inside the plant which was periodically pumped out by a gentleman named Max Ashland (Lenz Deposition, 2012, p. 74). Even then, the reason for this change was not due to a concern for the environment or its neighbors. Rather, the reason for the change was that the parking lot had been paved over and there was no longer a convenient place on-site to dump the PCE (Lenz Deposition, 2012, pp. 56-57).

Madison-Kipp owner and Chairman Mr. Reed Coleman also confirmed the practice of dumping waste chemicals onto the ground at the Madison-Kipp facility: "I have heard that many, many years ago when we did not have a blacktop driveway we put some substance on that blacktop driveway to reduce dust, and I do not know what that substance might have been." (Coleman Deposition, 2012, pp. 19-20). He went on to explain:

A. I do know that we used hydraulic oil. I did hear that.

Q. And you know that the hydraulic oil contained PCB's; correct?

A. Yes (Coleman Deposition, 2012, pp. 85-86).

The Madison-Kipp facility is in a low-lying area and during heavy rains, the grounds and even the building would be flooded. Transport of contaminated flood water and sediments from Madison-Kipp was responsible for depositing much of the PCE and PCB's now found in shallow soil in the neighboring residential yards (Lenz Deposition, 2012, p. 97). WDNR agrees with my opinion about contaminant transport by surface water during heavy rains. According to the State project manager:

Q. Have you determined what the transport mechanism was for the PCB found at these homes?

A. Based on what we know of the history of the site, there was a spreading of oils or some other liquid, industrial liquid, for dust control in the northeast portion of the site--- (Schmoller Deposition, 2012, p. 95).

Mr. Schmoller went on to say that the oils included hydraulic fluids which contained PCBs and that the runoff from the Kipp property carried the PCB-bearing oil and PCE to the backyards of the neighboring properties (Schmoller Deposition, 2012, p. 282).

Mr. Schmoller succinctly summarized this interpretation: "If you just look at the distribution of PCE all around the site, it makes sense that -- and you look at it in conjunction with the PCB data and the on-site PAH data, I think the three of those together give a pretty clear picture that whatever fluids were spread for dust suppressant in the northeast or southwest, had those components" (Schmoller Deposition, 2012, p. 283).

Madison-Kipp vented PCE to the atmosphere

Surprisingly, the vapor degreaser was not equipped with a condenser (Lenz Deposition, 2012, pp. 77-78). There was no form of vapor recovery or treatment between the basket of parts that were being cleaned and the vent to the atmosphere. Mr. Lenz agrees with my opinion that condensation of PCE vapor from Madison-Kipp's vapor degreaser was responsible for much of the PCE contamination we now see in soil, soil gas, groundwater and vapor\air. Mr. Lenz indicated that as an engineer he felt that during the wintertime the hot PCE vapor would condense and fall on the ground:

A. -- If you look at the elevated soil readings like you see near Monitoring Well 5, and the soil readings we see up in the northeast parking lot, you know, both those are areas where the venting of the degreasing operations occurred, based on our understanding of the site history.

Q. And then the -- the vapor coming out the vent condensed --

A. Yeah.

Q. -- into a liquid and hit the ground, is that basically it?

A. That's the understanding, yes. (Lenz Deposition, 2012, p. 279).

Madison-Kipp is a source of PAH's on Madison-Kipp and surrounding Class Area properties

PAH's are present in fuel oil and petroleum combustion products. The location of the former above ground fuel oil storage tank (AST) was identified in the northern most part of the building and noted in Exhibit 2. Madison-Kipp used fuel oil for heating and released PAH's through its smoke stacks and vents. WDNR agrees with my interpretation that Madison-Kipp is the source of PAH's found in the environment on and around the facility: PAHs have been identified in many soil samples (both onsite and offsite) often at levels that exceed the Wisconsin PAH cleanup criteria. Mr. Schmoller indicates that in his opinion both the VOC's and the PAH's are coming from Madison-Kipp (Schmoller Deposition, 2012, p. 100).

Releases from Madison-Kipp are the source of the PCB's in the environment at the Site and on surrounding Class Area properties

PCB's are present in some hydraulic oils and Madison–Kipp used hydraulic presses as part of their manufacturing operation. The hydraulic oils were mixed with other liquid wastes and intentionally spread on the gravel parking lots for dust control and for low cost liquid waste disposal. Both the Madison–Kipp environmental manager, Mr. Lenz, and the Company Chairman, Mr. Coleman, indicated under oath that PCB's were used at the site and spread on the gravel parking areas that surrounded the building. The PCBs moved into the neighboring properties after rain events, flood occurrences and wind driven conditions. It is disconcerting to realize that Madison-Kipp has decided to excavate the PCB contamination in soil only on their side of the fence somehow concluding that the neighboring properties were protected by a chain link fence along the property line. This callous disregard for the families who live next door will be seen throughout this report.

OPINION 2. Madison-Kipp violated applicable standards of conduct in its handling, disposal and releases of hazardous chemicals.

As acknowledged by Madison-Kipp employees and WDNR, the company dumped and spilled chemicals from the late 1940's until at least 1987. (See Opinion 1) As described in Opinion 2, this disposal behavior violated applicable standards of conduct which, since the 1940's, recognized that dumped and spilled chemicals could contaminate groundwater, and that exposure to PCE could harm humans, and thus

forbade such disposal. What is particularly remarkable here is that, even when strict environmental protection statutes and regulations were enacted in the 1970's and 1980's, Madison-Kipp nonetheless continued to spill and dump these chemicals.

Specifically, applicable standards of conduct violated by Madison-Kipp included:

- containment and capture measures for vapor degreasers, so that spent PCE is re-captured for re-use, and not released to the environment
- containment for PCE (and other chemical) storage tanks, so that chemicals escaping the tanks are not released to the environment
- prohibition of dumping and spilling PCE and other dangerous chemical wastes onto bare ground, for any reason, including to control dust or save money
- dispose of spent PCE and other dangerous chemical wastes in an approved facility

These standards applied with particular force when, as in this case, there were people living in homes immediately next door.

The violations of disposal standards by Madison-Kipp, coupled with its failure to investigate and clean-up these voluminous discharges as documented in Opinion 3, has caused the contamination to spread throughout Madison-Kipp's own property, but also onto the immediately adjacent properties of those in the Class Area and beyond – Madison-Kipp's own neighbors.

Environmental Persistence and Toxicity of Chlorinated Solvents Were Documented at Least as Early as the 1950s

As set forth in this report, the persistence and toxicity of the chemicals involved in this case and the need to use caution in disposing of them, particularly in or near residential areas, has been well-known to industry for many decades. This is especially true when, as is the case here, the residences are in such close proximity to the industrial facility.

Going as far back as the early 1940's VOC's were seen as valuable solvents in support of the war effort. The notion of wasting PCE or TCE was against the national interest and this war experience marked the beginning of a standard of care in the U.S. for handling chlorinated solvents in industry. Therefore, vapor degreasers, in my experience, always had a vapor condenser, in order to save (for re-use) as much PCE as possible. PCE is expensive and with the exception of Madison-Kipp, I have never read of or seen a

facility where 100% of the PCE is vented to the outside without some form of vapor recovery. I have seldom encountered sites, like Madison-Kipp, wherein waste PCE was openly dumped outside on the ground or spread on gravel surfaces, especially not into the 1980s when environmental awareness and environmental regulations were on the rise. The attitude at Madison-Kipp, as noted by Mr. Lenz, was that spilling and dumping of PCE and other chemicals was acceptable and common knowledge in the facility.

The wisdom and need for containment for above ground oil tanks goes back to the 1940's while the RCRA requirements for secondary containment for hazardous chemical storage began in 1976 with the passage of the Act. At Madison-Kipp, the PCE storage ASTs had no secondary containment and worse, one tank area was intentionally sloped to a surface drain that discharged to a garden area along a bike path and (unsurprisingly) is now a serious line source of contamination.

As cataloged in Opinion 1 above, the soil, soil vapor, groundwater and air contamination under and around Madison-Kipp was caused by years of improper chemical handling and inadequate waste management practices. Practices such as spills and leaks from the PCE tanks, spills during transfer of PCE from the storage tanks to the degreaser, dumping spent PCE to the ground, spreading PCE and PCB-bearing oil on the ground for dust control, and venting PCE vapors directly to the atmosphere because the degreaser had no condenser, all contributed to the substantial environmental problem that now plagues Madison-Kipp and the surrounding neighborhood. In fact, even when Madison-Kipp took the positive step of hiring a waste hauler to dispose of its chemical waste, this act was triggered by the paving of their former on-site dumping grounds (thus they were deprived of a convenient place to dump the waste), not by some sense of environmental responsibility.

As I have previously described in Opinion 1 of this report, PCE and other chemicals were dumped and otherwise disposed of at the Madison-Kipp Site from the late 1940s to at least 1987. Because no effort was made for decades to prevent these chemicals from migrating in soil, soil vapor and groundwater, that is precisely what they have done, with the consequence (among many other consequences) that PCE, PCB and PAH contamination has impacted the Class Area.

In the opinion described in detail below, I conclude that Madison-Kipp violated applicable standards of conduct both in its handling and disposal of these chemicals on the Madison-Kipp Site from the 1950s to 1987 and in its failure to adequately address the problem.

As described in Opinion 1 above, Madison-Kipp disposed of PCE (and other chemicals) to bare ground during these years. This disposal practice–along with the cumulative impacts of regular spills, leaks and

atmospheric discharges–represent major sources of PCE contamination throughout the proposed Class Area and beyond.

While scientific knowledge and environmental regulations have evolved in the last few decades, it was widely appreciated at least since the 1950s that dumping such industrial chemicals onto the ground could cause subsurface contamination. It was also widely understood during those years that chlorinated solvents such as PCE and TCE were especially persistent in the environment, and that exposure to these chemicals could cause adverse health effects. In this context, at the time Madison-Kipp was conducting dumping, it could have known and should have known that the practice of dumping industrial chemicals into the ground could cause serious environmental harm (Colten, 1991; Colten and Skinner, 2006)

Madison-Kipp's improper chemical disposal practices in the 1950s, 1960s, 1970s and 1980s were not representative of industry standards. Prior to modern environmental laws such as RCRA and CERCLA, poor waste disposal practices were more common, but the type of dumping conducted by Madison-Kipp was **not** standard practice across the industry during this time. Along with surface water and air pollution, the potential health effects of industrial chemicals in groundwater were well recognized in the 1960s and 1970s.

By 1970, the fact that unregulated industrial disposal of industrial wastes was causing environmental problems was acknowledged by the US Congress. As part of the Resource Recovery Act of 1970, EPA prepared a comprehensive report to Congress on storage and disposal of hazardous waste. The report describes "the imminent and long-term danger to man and his environment from improper disposal of such hazardous wastes."

In 1974, a study commissioned by the newly-formed Environmental Protection Agency (EPA) noted that groundwater can be impacted from spills and surface discharges at industrial sites from such practices as over-pumping during transfer of liquids to or from storage and carriers, by leaks from faulty pipes and valves and by poor control over waste discharges and storm-water runoff (Miller, et al., 1974, Ground Water Contamination in the Northeast States, p. 230). The study went on to say that degradation of ground-water quality over broad areas due to poor housekeeping is well known in sections of the study region. This study is illustrative of the growing awareness that industry's chemicals handling and waste disposal practices can cause groundwater contamination.

RCRA (Resource Conservation and Recovery Act) was enacted by Congress in 1976 and the ensuing regulations went into effect in 1980, thus regulating hazardous waste disposal. CERCLA (Comprehensive

Environmental Response, Compensation and Liability Act, or Superfund) was enacted in 1980. These laws ushered in the modern era of hazardous waste management and groundwater remediation. Even though these federal laws were passed in the 1970s and 1980s, the understanding that groundwater contamination was a serious problem did not suddenly arise in the 1970s and 1980s. Rather, these laws were developed in response to an earlier (and growing) public alarm about this problem. The link between industrial waste disposal and groundwater pollution was widely understood by the 1950s and synthetic organic chemicals like PCE were particularly problematic because of their persistence in the environment.

In the technical literature, the persistence of TCE, (a VOC closely related to PCE), in the environment was noted as early as 1949 by Lyne and McLachlan. The article, published in *The Analyst* a journal published by the Royal Society of Chemistry (London), describes two cases of groundwater contaminated by TCE, one due to a tank release and the second due to a leaking disposal pit.[4] The publication concluded that "contamination by compounds of this nature is likely to be very persistent."

Regarding health effects, our understanding has certainly improved over the years, but the potential negative health effects of chlorinated solvents, like PCE, were also understood during the time period Madison-Kipp was dumping and spilling PCE and other chemicals. For example, recognizing the need to limit workers' exposure, the U.S. Public Health Service published Maximum Allowable Concentrations for workplace exposures to PCE and other chemicals as early as 1943.

Another example of the recognition of the threat to people and the environment from industrial chemicals is the 1974 EPA survey of water quality of the nation's drinking water systems. One goal of this survey was "to determine the concentrations, sources and potential danger of certain organic chemicals in municipal drinking water supplies". This, of course, eventually led to development of drinking water standards or MCLs (maximum contaminant levels) and MCLGs (maximum contaminant level goals). The fact that the federal MCLG for PCE had to be set at a concentration of 0 parts per billion in order to be sufficiently protective of human health speaks to the toxicity of this chemical.

Several guidance documents exist from this era that acknowledge potential environmental problems from land disposal of industrial waste, including a 1956 report from the Manufacturer's Chemists Association and the Handbook of Vapor Degreasing, issued by the American Society for Testing and Materials (ASTM) in 1976.

[4] See: Rivett, Feenstra and Clark, 2006, Lyne and McLachlan (1949): Influence of the First Publication on Groundwater Contamination by Trichloroethene, Environmental Forensics, v. 7, pp. 313-323.

Colten (1991) concluded that, even as early as 1940, the risk associated with surface discharge of chemicals was understood: "…by 1940 knowledge was sufficient to argue against surface discharges of harmful fluids. Legal precedent, though inconsistent, proved there was ample awareness of the physical processes and financial liabilities before 1950 to expect careful disposal of liquid waste to a land surface."

This conclusion is consistent with my experience of the evolution of environmental awareness over my 40 plus-year career as an environmental professional.

Environmental Managers at Madison-Kipp were not trained for this important job

Mr. James B. Lenz worked at Madison-Kipp from June of 1980 until June 15, 2011, a period of 31 years. Mr. Lenz graduated in engineering mechanics in May of 1980 and joined Madison-Kipp in June as a project engineer. In 1988 he became the facility engineer. From 1996 to 2006 Mr. Lenz also had the title of Environmental Manager. Mr. Lenz was not a licensed engineer, he never took any environmental courses and he never had any environmental training. He had no groundwater contamination training, no remediation training, no vapor intrusion training, and no training in PCE handling practices. Mr. Lenz was assigned the job on an interim basis and they simply never found a replacement for him.

Mr. Lenz indicated on page 131 of his deposition that in the span of two years (1994-1996) there were four environmental managers at the company. The 1994 letter from WDNR to Madison-Kipp placed responsibilities on Madison-Kipp to characterize and clean up the site but it seems there was no-one on staff with the training or authority to carry out these responsibilities. Mr. Lenz did not know why there was so much turnover, however it took another 18 years before Madison-Kipp began to seriously address WDNR's concerns.

Despite Mr. Lenz's title of Environmental Manager, he was not making the important decisions about the soil and groundwater investigation.

> Q: So even during the 10 years that you were the Environmental Manager and the company was addressing the PCE contamination problem and -- and working with DNR on it, during that 10-year period when you were environmental manager you were not kept in the loop by upper management at the company about disputes with DNR over what needed to be cleaned up and when, right?
>
> A: Correct
>
> Q: You were kept in the dark about that stuff?
>
> A: Yes. (Lenz Deposition, 2012, p. 233).

Mr. Lenz confirmed that upper management, not he as the Environmental Manager, was making the decisions about how to handle the PCE contamination problem (Lenz Deposition, 2012, p. 111).

OPINION 3. Madison-Kipp violated applicable standards of conduct in its failure to promptly and thoroughly investigate and remediate its contamination and protect people and the environment.

As set forth above in Opinions 1 and 2, Madison-Kipp discharged toxic chemicals on and around its property from the late 1940's to at least 1987. Under prevailing standards of conduct, including Wisconsin's own statutes and regulations, Madison-Kipp was required to promptly investigate the extent of the contamination its operations had caused, and clean it up. However, as I describe in this Opinion 3, Madison-Kipp not only has failed to investigate the extent of the contamination, but, to the contrary it has spent the years since the chemical discharges (1) ignoring the problem altogether; (2) trying to blame someone else for it; (3) invoking its political ties to support the company's desire to do as little as possible; and (4) portraying the problem as one that is not as serious as it really is. Also, and not surprisingly given its attitude toward competent and timely investigation, Madison-Kipp has yet to determine (let alone implement) a comprehensive remedy for their contamination, which continues to spread. In these ways, documented in this Opinion, Madison-Kipp has violated applicable standards of care. The unfortunate, but predictable, result of this behavior is that the contamination has been allowed to spread unchecked over the decades since discharge, and has infiltrated the properties of Madison-Kipp's neighbors in the immediately adjacent Class Area and beyond.

There are many sources of standards of conduct for environmental investigation and remediation.[5] Perhaps most accessible to Madison-Kipp was Wisconsin's own hazardous substance spill law ("Spill Law"), S. 144. 76 (3) Wisconsin Statutes. Since 1977, this Spill Law required Madison-Kipp to, among other things, determine the extent of the contamination, and clean-up/properly dispose of the contaminants. (See WDNR July 18, 1994 letter to Madison-Kipp).

An important provision of the Spill Law provides as follows:

"Responsibility. A person who possesses or controls a hazardous substance which is discharged or who causes the discharge of a hazardous substance shall take the actions necessary to restore the environment to the extent practicable and minimize the harmful effects from the discharge to the air, lands, or waters of the state."

[5] See, for example, U.S. EPA, 1997, Guidance on the Use of Section 7003 of RCRA; USEPA, 1989, RCRA Facility Investigation Guidance, Interim Final, OSWER Directive 9502.00-6D; and National Contingency Plan: 40 CFR Part 300.

The Wisconsin Administrative Code NR 700 through NR 728 establishes requirements for interim actions, public information, site investigation, design and operation of remedial action systems, and case closure. Wisconsin Administrative Code NR 140 establishes groundwater standards.

In addition to Wisconsin Laws and Codes, there are numerous federal laws, professional societies such as the National Groundwater Association (NGWA) and the American Society for Civil Engineers (ASCE) and national and International Standards Societies such as ASTM International, that provide rules and guidance on environmental site investigation and remediation that I have relied upon. As noted earlier, I am certified by the NGWA, authored the Charter paper in NGWA's peer-reviewed Journal: Groundwater Monitoring and Remediation, and gave numerous contamination site training courses over 10 years on behalf of the NGWA. I am a Fellow of ASCE, a 38 year member, and have published in its peer-reviewed journal. For ASTM, I received their highest honor, the Award of Merit, and have developed numerous national standards in their Groundwater and Vadose Zone Monitoring subcommittee.

Further there are reference books, peer reviewed papers in journals and extensive contamination site experience that I have drawn upon over the past 40 years to make the following criticisms. In short, Madison-Kipp's egregious behavior violates laws, regulations, existing technical guidance, and shows a callous indifference to the health and wellbeing of its neighbors.

The potential for chemicals discharged at Madison-Kipp to volatilize and infiltrate Madison-Kipp's own facility and the homes of its nearby neighbors was well understood since at least the early 1990's. The 1994 DNR letter, discussed below, coincided with a growing national awareness of indoor air impacts of industrial wastes. In the early 1990s as presented by Folks and Arell (2003) in their paper entitled *Vapor Intrusion-EPA's New Regulatory Initiative and Implications for Industry*, the scientific community and the regulatory community were rapidly moving toward a realization of the risk of vapor Intrusion. By 1992 EPA had published its Guidance on "Assessing Potential Indoor Air Impacts for Superfund Sites. By 1993 EPA had published another guidance document entitled: Options for Developing and Evaluating Mitigation Strategies for Indoor Air Impacts at CERCLA Sites. Clearly by 1994 there was sufficient guidance on how to evaluate the potential risks posed by vapor intrusion at VOC-contaminated sites that Madison-Kipp could have followed had they chosen to be responsive to the DNR letter. Instead, Madison Kipp chose to violate existing standards of care. By 1992 I had developed my first ASTM national soil gas sampling standard entitled: Standard Guide for Soil Gas Monitoring in the Vadose Zone (D5314-92; revised in 2006). By 1993 one of my graduate students was already doing research for his MS thesis on subsurface air migration under my direction.

In 1994 (WDNR, July 18, 1994 Letter to Jack Schroeder of Madison-Kipp) WDNR invoked the Wisconsin Spill Law of 1977 and ordered Madison-Kipp to determine the horizontal and vertical extent of contamination and clean-up/properly dispose of the contaminants. WDNR urged Madison-Kipp to act swiftly: "It is important that an investigation begins at your site as soon as possible." Considering that the extent of contamination in the subsurface is still not adequately delineated 18 years later, it is obvious that Madison-Kipp did not act promptly on WDNR's order. WDNR also made the prescient statement that: "The longer contamination is left in the environment, the farther it can spread and the more difficult and costly it becomes to cleanup." By leaving contamination in the ground all these years and focusing on saving money and avoiding controversy, Madison-Kipp has allowed WDNR's prediction to come true, and it is now faced with a more costly and complex cleanup than it would have faced if it had heeded WDNR's mandate. Class Members' exposure to Madison-Kipp's chemicals also could have been discovered many years earlier, which could have led to earlier efforts to mitigate this risk to human health. Instead, residents' exposure to Madison-Kipp's chemicals continued unabated for at least the 18 years of inadequate environmental work at this site (not to mention the many years prior to 1994 that the contamination existed but was not known to WDNR).

Until about one year ago, the opportunity for any meaningful environmental investigation had been marred by Madison-Kipp's inaction and disregard for the potential consequences of its conduct on the health of its neighbors and its own employees. This is the principal reason that, 18 years after WDNR's letter to the company, the Madison-Kipp Site and surrounding residential properties remain severely contaminated. Madison-Kipp's own environmental manager[6] agrees with me that the investigation has been inadequate:

> Q: Mr. Lenz, isn't it true to say that you don't believe Madison-Kipp has adequately addressed the PCE contamination problem?
>
> A: I would say that that's probably true. (Lenz Deposition, 2012, p. 237).

WDNR confirms that Madison-Kipp has not made enough progress in its environmental investigation to have arrived at a comprehensive remedial strategy. As Mr. Schmoller puts it on page 21 of his 2012 deposition: "Well, at this point we have not -- Well, we have not chosen any remedial actions at the site yet, so from their perspective (Madison-Kipp) there aren't any disagreements because there have not been any decisions made."

[6] Mr. Lenz is the individual Madison-Kipp's Chairman of the Board of Directors, Reed Coleman, identified as the one person he trusted to take adequate care of this problem on behalf of Madison-Kipp (Coleman Deposition, 2012, p. 63).

Madison-Kipp's failure to properly investigate is exemplified in the chronology and payment history of the vapor mitigation systems for nearby residents in the last year or so. Faced with the certainty that Madison-Kipp is the source of the chemical vapors threatening neighbors in soil vapor, subslab vapor and indoor air, the company still acted so slowly in mitigating this problem that the State stepped in to complete the task[7]:

> Q Okay. Why is that? Why isn't Kipp paying for that?
>
> A. It was a decision that was made back early this -- early in December, January, December 2011, January 2012. We were concerned about the pace at which things were getting done, and so we said -- we made an internal decision to just go ahead and start doing sampling and mitigation work ourselves to pick up the pace of the rate that it was getting done (Schmoller Deposition, 2012, p. 91).

Even Mr. Coleman agrees that Madison-Kipp did not respond promptly to its environmental problems (Coleman Deposition, 2012, p. 30).

Towards the end of 2011, there was growing frustration at WDNR at the pace at which investigative work was being done, and in particular, WDNR felt a sense of urgency for Madison-Kipp to conduct vapor sampling in subslabs of Class Members' homes.

> "We had indications that we had off-site problems, and, you know, we are dealing with PCE, a carcinogen, and all that sort of thing. Things weren't getting done…So things were getting drawn out and drawn out and drawn out. So I just said, 'this is crazy.' We have got to make a decision. We need to get these samples collected. They are not getting collected. That's when I had made a strong pitch for screw it, let's just us, the agency, go out and take these samples so we can get it done and we will cost recover later." (Schmoller Deposition, 2012, pp. 173-174)

Mr. Schmoller went on to say that there was a lot of internal resistance to his proposal for WDNR to conduct the vapor sampling that Madison-Kipp had neglected to do. Mr. Schmoller expressed further frustration with Madison-Kipp's lack of responsiveness. He indicated that he would have meetings with Madison-Kipp in which there would be no immediate response. He indicated that tasks dragged on for months beyond the date requested by WDNR (Schmoller Deposition, 2012, pp. 176).

In November 2011, Mr. Schmoller's frustration reached an apex and he asked to be reassigned. As he put it, WDNR should "Find somebody who's more than happy to let somebody else control the site. You can assign it to somebody who would be more than happy to let it dog along. If that's what administration wants, fine." (Schmoller Deposition, 2012, pp. 180)

[7] Madison-Kipp paid for vapor mitigation systems for 146, 150, 154, 162 and 166 South Marquette Street but all subsequent mitigation systems were installed using WDNR funds.

Madison-Kipp's attempts to curtail regulation and avoid public knowledge of its environmental problems

Even while it delayed action on an adequate environmental investigation, Madison-Kipp also sought to minimize publicity and use political connections to avoid its obligations. As Mr. Lenz stated: "The company was always trying to be hush hush about the environmental situation because of the scrutiny that we got from the neighbors and the media." Mr. Lenz went on to acknowledge that it was just common knowledge not to talk about the environmental problems at Madison-Kipp (Lenz Deposition, 2012, p. 163). The WDNR project manager, Mr. Schmoller, indicated that at some point he was aware that Madison-Kipp had gone to the Governor's office complaining about what the State was requiring Madison-Kipp to do at the site (Schmoller Deposition, 2012, pp. 163-164). In his 30 years with WDNR Mr. Schmoller did not recall any other case in which a regulated company went to the Governor's office complaining about decisions that were being made relative to an investigation and cleanup of a site (Schmoller Deposition, 2012, p. 169).

According to a memo from Michael, Best & Freidrich, LLP, Madison-Kipp's attorney, Madison-Kipp solicited the state to file a lawsuit against it because "MKC would prefer to spend its resources defending allegations against the State of Wisconsin and restoring the environment than paying out-of-state plaintiffs' counsel given that the federal statute provides for the plaintiffs' attempted recovery of their fees and costs."

According to WDNR's project manager, Mr. Schmoller, this was an unusual request. He was asked whether he had ever been involved in a situation where a company that was being regulated by DNR asked DNR or the State to sue it to block citizens from suing the company themselves. Mr. Schmoller indicated that he had never been involved or even heard of anything like that (Schmoller Deposition, 2012, p. 151). In September of 2012, the State of Wisconsin eventually did sue Madison-Kipp alleging (among other things) that Madison-Kipp failed to notify the state of a chemical release and failed to take actions necessary to restore the environment or to minimize the harmful effects to lands or waters of the state caused by the discharge of PCE and PCBs.

Madison-Kipp's goal: spend as little money as possible

In my experience, it is not unusual for a responsible party in an environmental cleanup to seek cost efficiency. However, Madison-Kipp sought to minimize costs by denying responsibility for its own actions and failing to acknowledge the consequences of its inaction on its neighbors. On page 190 of his deposition, Mr. Lenz is asked:

Q: Did you ever hear that one of the company's goals was to spend as little as money as possible?

A: Yes - - -

Q: OK, who did you hear that from please?

A: Tom Caldwell. I probably heard it from several people.

Q: Caldwell told you that?

A: Yes.

Q: Alright, and he told you that when he was the President of the company?

A: Yes.

Madison-Kipp delayed the cleanup by denying it was the source of the contamination

As previously referenced in this report, Madison-Kipp was required to conduct a timely, proper and thorough investigation of the contamination. Madison-Kipp failed to meet these requirements and instead delayed the investigation and failed to conduct a proper and thorough investigation. An example of this failure is Madison-Kipp's denial of its responsibility for the profound subsurface impairment, even in the face of growing evidence to the contrary. For example, according to Mr. Lenz, there were discussions at Madison-Kipp about blaming other companies for the PCE contamination:

Q: Sure. Were there discussions at the company, Madison-Kipp, where people at the company were blaming some other company or somebody else's property, at least initially, for the PCE contamination saying it came from someplace else?

A: Yes. I remember conversations about that because the way the water flow direction that I was told about, it was coming from the Kupfer Iron Works direction.

Q: Who told you that?

A: I think I heard that from Jack Schroeder.

Q: Okay. The environmental manager, right?

A: Yeah. (Lenz Deposition, 2012, pp. 120-121).

This strategy of avoidance was communicated to Madison-Kipp's consultants as early as 1994. Mr. Lenz described communicating to Dames & Moore (an early environmental consultant at this site) that Madison-Kipp's goal was to conduct just enough investigation to support the theory to WDNR that the source of the contamination was coming from offsite so that its cost for investigation would be held to a minimum. (Lenz Deposition, 2012, p. 128). It is sadly notable that Madison-Kipp expressed no concern whatsoever for the well-being of its employees or of its neighbors who, unknowingly, were being exposed to its chemicals on a daily basis. Nor did Madison-Kipp express any concern for protection of the environment or of the growing possibility that its chemicals were impairing groundwater resources of the

State. Its only concern was to avoid a proper investigation by blaming someone else and minimizing its costs. Mr. Lenz was troubled by this strategy (but apparently not troubled enough to do anything to correct it):

> Q: Do you think that what [Madison-Kipp employee] Schroeder is saying here to the president of the company and another member of upper management, vice president of the company, is acceptable?
>
> A: --- Not if I'm signing my name to it, no. ---
>
> Q: OK why wouldn't you? That's not right is it? That's not right to -- to be doing that is it?
>
> A: I agree it's not right. (Lenz Deposition, 2012, p. 134).

Unlike Mr. Lenz who at least had a tinge misgiving about Madison-Kipp's strategy, Mr. Coleman to this day defends the strategy: "Yes, I think that was the right thing to do." (Coleman Deposition, 2012, p. 124).

Another of Madison-Kipp's cost-containment strategies was to deny that any of the contamination extended offsite:

> Q: Do you recall any discussion at the company about how the - - the company['s] hoping the environmental problem did not go offsite and affect the neighbors?
>
> A: Yes.
>
> …
>
> Q: Was that a concern expressed? That this is going to be a lot more expensive to deal with if the contamination has gone on to neighbors properties?
>
> A: Yes it was a concern.
>
> Q: Sure. Expressed by whom?
>
> A: [Madison-Kipp, President]Tom Caldwell. (Lenz Deposition, 2012, pp. 225-226).

It's difficult to tell if its denial of off-site migration of the contamination was wishful thinking or knowing misinformation. Regardless, it has since proven to be completely wrong.

Madison-Kipp delayed the investigation and the cleanup by not being responsive to the 1994 order

As noted above, WDNR ordered Madison-Kipp to determine the horizontal and vertical extent of contamination and clean-up or properly dispose of the contaminants in the July 18, 1994 letter from Marilyn Jahnke, Emergency & Remedial Response Program to Mr. Jack Schoeder of Madison-Kipp. Just 3 months earlier, on April 7, 1994 Mr. Jack Schroeder of Madison-Kipp wrote a memo to fellow

employee Lyle Crouse and copied President Tom Caldwell, stating he had received a call from Mike Halsted from WDNR that the Madison Brass Works site investigation showed that the PCE contamination came from offsite (i.e., from Madison-Kipp). Schroeder told Halsted that Madison-Kipp does not currently use PCE. Schroeder said he told Halsted that there was past history at the Kupfer Iron Works facility of soil contamination and underground tank removal. However, as noted previously by Mr. Lenz, the use of PCE was well known around Madison-Kipp as was the intentional dumping and spills. By not revealing this information that was common knowledge among site workers, Madison-Kipp was being evasive and trying to place the blame for contamination on other facilities, from the very beginning of its interactions with state regulators.

With its 1994 letter to Madison-Kipp, WDNR expressed a sense of urgency when it requested that Madison-Kipp begin environmental activities at the site as soon as possible. Five years later, the work had not been completed and WDNR expressed its displeasure:

> "It has come to my attention that investigative efforts at the above site have not progressed as proposed. To date, the vertical and horizontal degree and extent of groundwater contamination has not been determined at the site. In addition, quarterly sampling of site monitoring wells has not been conducted as required." (WDNR, June 30, 1999 letter from Lawrence Lester to Bud Hauser of Madison-Kipp).

The delays persisted for years. On this issue, WDNR's Schmoller testified:

> Q Isn't the State in 2006 telling Madison-Kipp essentially the same thing that it's been telling Madison-Kipp since 1994?
>
> A: Yeah. (Schmoller Deposition, 2012, p. 294).
>
> Q That's the same spill law in paragraph 22 that was in the 1994 responsible party letter, right?
>
> A Correct.
>
> Q And it's the same spill law that's cited in the Department's 1999 letter to Madison-Kipp, which is Schmoller 32 in this deposition, right?
>
> A Correct.
>
> Q And it's the same spill law that is cited in Schmoller No. 33, the bottom of page 1 of Schmoller No. 33, which is the Department's letter to Madison-Kipp in September of 2006, correct?
>
> A Correct.

WDNR's project manager, Mr. Schmoller, agrees with me that Madison-Kipp's efforts between 1994 and the current day have not been sufficient to define the full extent of the contamination, and over this long span of time there also hasn't been an adequate cleanup of the contamination (Schmoller Deposition,

2012, p. 296). Mr. Schmoller also agrees with me that much of the work being conducted this year could and should have been completed years ago (Schmoller Deposition, 2012, p. 299).

> Q.--- what the State told Madison-Kipp to determine, which is the nature and extent, the horizontal and vertical extent of groundwater contamination, drilling those wells that are going to be drilled in 2012 would have been a very appropriate thing to do.
>
> A. Yes. Those -- To meet the requirements of the spills law, those wells could have been installed earlier.
>
> Q. They're being drilled 18 years after the State told Madison-Kipp to determine the horizontal and vertical extent of groundwater contamination, right?
>
> A. Yes. (Schmoller Deposition, 2012, p. 300).

In February of 2005 a soil sample was collected near the Madison-Kipp property line, just five feet or so from a neighbor's residential yard. The sample contained 51,800 parts per billion of PCE. Such a high value in shallow soil raises a strong concern for the potential of vapor migration. According to WDNR project manager, Mr. Schmoller, if those concentrations had been identified today, his agency would be out in the field in a couple of months looking at subslab vapor in the nearby residences. (Schmoller Deposition, 2012, p. 208). However, at this site, it took Madison-Kipp years to get around to testing subslab vapor in neighbor's homes, and when the sampling was finally conducted, PCE was detected in vapor under most of the homes and even inside some of the homes. Strikingly, Madison-Kipp's current environmental consultant, ARCADIS, rejects that soil contamination is contributing to the PCE vapors on neighboring properties. (Trask Deposition, 2012, p. 174). This conclusion lacks credibility and is indicative of the non-scientific analysis being performed at this site.

The ARCADIS project manager, Ms. Trask, also agrees with me that WDNR's 1994 directive to Madison-Kipp to determine the horizontal and vertical extent of contamination and cleanup/properly dispose of the contaminants has not been satisfied (Trask Deposition, 2012, p. 140). For example, only within the last year, an SVE system was installed in the northeast portion of the site (ARCADIS, 2012, SVE Pilot Test Summary Report); a PCB investigation for soil was conducted on and off site (ARCADIS, 2012, Work Plan for PCB Investigation); new deep bedrock groundwater monitoring wells were installed (ARCADIS, 2012, Bedrock Characterization Work Plan); off-site soil vapor sampling was conducted; and soil sampling was conducted under the Madison-Kipp building (ARCADIS, 2012, Site Investigation Work Plan). All of the above activities could have been conducted in the 1990s. In a case like this with PCE in groundwater and soil vapor, as Ms. Trask concurred, it is important to promptly undertake an investigation and cleanup (Trask Deposition, 2012, p. 142). It is ironic that, in 2012, Madison-Kipp's consultant is mimicking WDNR's 1994 admonition to conduct the environmental work promptly. Even

though Ms. Trask agreed that the work should have been conducted sooner rather than later, the 18 year delay did not concern her enough to ask anyone:

> Q. Did you ever ask anybody why it's taken more than 18 years to look under the building?
>
> A. No. (Trask Deposition, 2012, p. 143)

Madison-Kipp's long-term lack of response has allowed the contamination to spread, has dramatically increased the complexity of the cleanup and has subjected the families in the Class Area to decades of exposure and property damage.

Madison-Kipp still denies the magnitude of its environmental problems

Part of the delay was due to repeated and unsubstantiated claims from Madison-Kipp that the contamination was not as bad as it turned out to be. In combination with the strategy of blaming others for the contamination, Madison-Kipp was able to avoid the expense of a thorough investigation and cleanup for the decades since the chemicals were initially dumped, spilled, etc. The denial persists to this day: in his 2012 deposition, Mr. Coleman stated: "I don't believe it's a serious problem." (Coleman Deposition, 2012, p. 37). Even Mr. Coleman's own staff can't bring themselves to back their boss's incredible claim that the environmental impairment at this site is not a serious problem:

> Q: Is there ever a time on up through today where you would have described the amount of PCE contamination in the soil as minor?
>
> A: I don't -- No. (Lenz Deposition, 2012, p. 170).

Mr. Coleman can't be dissuaded: Q. So you believe, even given what you know in 2012, that the PCE contamination in the soil on your company's property and the groundwater on your company's property and in the vapor underneath your neighbors' homes is a rather normal and rather widespread occurrence. A. Yes. (Coleman Deposition, 2012, p. 140).

Another example of Madison-Kipp's strategy to understate the magnitude of this problem is its assertion that only four or five homes directly adjacent to the Madison-Kipp facility would require vapor probes in the yards. WDNR did not agree with this unsubstantiated assertion (Schmoller Deposition, 2012, p. 177). Subsequent sampling has detected Madison-Kipp's contamination in soil vapor on at least 49 residential properties (Exhibit 3). As described above, WDNR has taken over the job of installing subslab depressurization systems in homes because of frustration with the pace of Madison-Kipp's work. To this day, Madison-Kipp's Chairman of the Board of Directors denies any obligation to protect the neighbors from Madison-Kipp's carcinogenic chemicals: "So from my point of view, we have erred on the side of

providing [home depressurization systems] and not on the side of resisting." (Coleman Deposition, 2012, p. 41).

In a 2009 report (Schmoller 19 exhibit) RSV (another of Madison-Kipp's environmental consultants) recommended no further sampling or proper abandonment of the off-site soil wells, "due to low VOC detection." This "no further testing necessary" position has been taken by Madison-Kipp and its consultants repeatedly since 1994, even though it has never been warranted. For example, notwithstanding RSV's 2009 report conclusion, we now know that PCE in off-site soil vapor is one of the most pressing problems at this site. WDNR recognized the unsupportable nature of, and thus rejected, RSV's recommendation (Schmoller Deposition, 2012, p. 190). In Schmoller Exhibit 25, Schmoller had noted a request for a perimeter soil gas survey to be made of the Madison-Kipp facility that was never done because it was denied by the company (Schmoller Deposition, 2012, p. 205). The potential danger to neighbors from exposure to Madison-Kipp's toxic chemicals would have been understood earlier if Madison-Kipp had heeded WDNR's request.

Decades of Madison-Kipp's cavalier attitude toward management of toxic chemicals has led to massive releases to the environment and an exceptionally slow response to this problem. The corporate attitude that gave rise to this unfortunate (and largely avoidable) situation is perhaps exemplified by Madison-Kipp's CEO Mr. Coleman who (even in 2012) expressed no regrets about any aspect of his company's behavior regarding the PCE contamination problem, either how the PCE got out of the plant and into the environment, or how his company dealt with the problem once the problem became known (Coleman Deposition, 2012, p. 152).

Madison-Kipp has used its environmental consultants as advocates, not fact-finders

In 2011, ARCADIS was retained by Madison-Kipp's attorneys, Michael Best & Friedrich (MB&F), to serve in a confidential consulting relationship, to perform confidential services and to assist the law firm in rendering legal advice to Madison-Kipp (MB&F February 1, 2012, Letter from David Crass to Jennine Trask of ARCADIS). According to this agreement, ARCADIS' work is to be performed under the direction of the law firm, not Madison-Kipp's environmental manager or anyone without a direct interest in Madison-Kipp's success in this lawsuit.

Madison-Kipp's use of environmental consultants as advocates did not begin with ARCADIS. According to Mr. Schmoller of WDNR, there were numerous occasions in which the previous consultant, Mr. Robert Nauta, recommended that no further work should be done even though WDNR believed strongly to the contrary (Schmoller Deposition, 2012, pp. 209-210).

The recent sequence of events relating to discovery of PAHs in off-site soil is a good example of ARCADIS engaging in advocacy at the expense of good science. PAHs are polycyclic aromatic hydrocarbon compounds. PAHs are a family of complex hydrocarbon molecules found in crude oil and other petroleum products. They are also formed during combustion of petroleum and other organic substances. Some PAHs are highly carcinogenic. In the summer of 2012, soil sampling on the Madison-Kipp site and in nearby residential yards found PAHs, some of which are in excess of Wisconsin's non-industrial direct contact RCL (Residual Contaminant Level). In September of 2012, ARCADIS' Ms. Trask wrote a letter to the State of Wisconsin on behalf of Madison-Kipp asserting that there was insufficient evidence that PAHs originated from the Madison-Kipp site and that, therefore, they should not be a "driver" for off-site remediation. Ms. Trask noted that its subcontractor observed burn pits and backyard grills in nearly every property that borders Madison-Kipp, thus implying that backyard barbeques may be to blame for contaminating the neighbors yards with PAH's, not the 100-year old industrial facility situated mere feet away from the residential lots that had a long history of releasing toxic chemicals to the environment and a long history of denying the consequences of this legacy. It may be true that more data would clarify the nature and extent of PAH contamination in the neighbors' soil, but ARCADIS' first response to these findings is to question Madison-Kipp's responsibility and to play down the potential severity of the problem. This is advocacy and not technical inquiry.

The data currently available demonstrate that, there were more exceedences of state standards for PAHs in the top two feet of soil from neighbors' yards than for any other chemicals: more exceedences than PCBs and more exceedences than VOCs, including PCE. As described by Ms. Trask:

> Q. You didn't want PAHs to be the compound that determines how much off-site remediation has to be implemented, is that true?
>
> A. Yes.
>
> Q. Okay. And you are talking there, aren't you, about residential results, right?
>
> A. Yes.
>
> Q. And you are talking there about results on my clients' property, right?
>
> A. Yes.
>
> Q. And you knew if you were successful in getting the state to agree to this argument that PAHs not be the driver, that less residential soil would be remediated, true?
>
> THE WITNESS: Yes.
>
> Q. And you were doing that on behalf of Madison-Kipp, true?
>
> A. Yes. (Trask Deposition, 2012, p. 87).

Ms. Trask, is by her own admission, "not a PAH expert" (Trask Deposition, 2012, p. 96). She acknowledged in her deposition that she did not know that there are analytical methods that can be used for differentiating PAHs from different sources. This admission is all the more striking because it highlights that the assertions in Ms. Trask's September 11, 2012 letter are not based on a sound knowledge of the environmental fate and transport of PAHs. In my opinion, the basis of ARCADIS' assertions about whether or not Madison-Kipp may have caused the PAH impacts in the neighbors' yards is simply a desire to avoid an even costlier cleanup.

When asked if she would have been interested in knowing about these analytical methods that can be used to differentiate PAH sources before arguing that the PAHs should be left in place and should not be a driver of cleanup, Ms. Trask agreed:

> A. That there's a method to analyze?
> Q. Correct.
> A. Would I have wanted to know that?
> Q. Correct.
> A. Yes. (Trask Deposition, 2012, p. 97).

According to Ms. Trask, an attorney was always present during ARCADIS' meetings with WDNR (Trask Deposition, 2012, p. 129). While it is permissible for attorneys to be present at technical meetings with environmental regulators, in my experience, it is unusual for the regulated company's attorney to attend every meeting.

ARCADIS neglected to inquire about Madison-Kipp's historical chemical usage

A site investigation generally includes an historical analysis to understand how chemicals were used at the site and how and where they may have been released. This type of inquiry is done both for efficiency and for completeness (i.e. to minimize the possibility of missing contamination at a certain place because the consultant does not know to look there). Madison-Kipp's Mr. Lenz agrees with this opinion. He indicated that it was important for the company to investigate and to learn all of the different places where PCE had been spread or spilled or dumped. To date, however, ARCADIS has not interviewed Mr. Lenz about the sources of the contamination, nor has ARCADIS ever reviewed or asked for operational records from Madison-Kipp which could show when materials containing PCE, PCBs, or PAHs were purchased, how much was purchased and how the chemicals were used at the facility (Trask Deposition, 2012, pp. 99, 101). Neither has WDNR interviewed any current or past employees in an effort to determine where PCE might have been spilled or leaked within the plant (Lenz Deposition, 2012, pp. 271, 274). As such,

ARCADIS does not know, and even WDNR does not know, how much PCE was disposed of, or where, by Madison-Kipp (Trask Deposition, 2012, pp. 99, 101).

One month before the WDNR July 1994 letter to Madison-Kipp, the National Research Council published a book entitled: Alternatives to Ground Water Cleanup. Prior to publication, the volume was reviewed by the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine. A key chapter in the book is entitled Characterizing Sites for Ground Water Cleanup with a subchapter entitled Plume versus Source which states:

"Conceptually, the contaminated ground water environment consists of two distinct parts, as explained in Chapter 2: (1) the plume of dissolved contaminants and (2) contaminant source areas. Contaminant source areas include not only typical near-surface sources such as leaking drums, process wastes, and sludges, but also deep subsurface sources such as residual nonaqueous-phase liquids (NAPLs), pools of NAPLs, and metals that have precipitated in mineral phases having low solubility. The prospects for ground water cleanup are much different for the plume of dissolved contaminants than they are for the source areas. Based on this observation, it is clear that site characterization studies should be designed to define early the parts of the site that can be considered source areas and the parts that can be considered as the dissolved plume, because the potential remedial options are significantly different for the two parts."

At Madison-Kipp, source areas still have not been defined; the dissolved plumes in the shallow and deep groundwater have not been defined; and the potential for DNAPL cannot be ruled out; since the sources have not been identified. Madison-Kipp's haphazard approach violates every standard with which I am familiar regarding site characterization.

In my capacity as a member of the Interagency DNAPL consortium, I am aware that determining the mass of VOCs/PCE in-situ is extremely difficult and therefore that it is very important to try to determine the usage of PCE by evaluating purchasing records or waste manifests or by other means, including personal inquiries. Madison–Kipp did not attempt to use any of these approaches and have not provided any records of VOC/PCE purchases.

Ms. Trask went so far as to assert that it is not important to know how and when PCE was disposed of at a site when trying to reach conclusions as to the nature and extent of the problem and how to remediate it (Trask Deposition, 2012, pp. 99, 105-106). I strongly disagree with this perspective and highly doubt that this opinion is widely shared by other ARCADIS professionals. The ASTM standard for Phase I Environmental Site Assessments (ASTM E1527) clearly calls for a records review and interviews with

past or current occupants of a facility in order to identify recognized environmental conditions. This type of historical inquiry is a standard part of an environmental investigation.

Madison-Kipp did not investigate under degreaser locations

Most of the PCE consumed at this site was used in the vapor degreaser which was positioned in at least two different locations during its operation at the site. It is common for there to be spills and leaks from vapor degreasers: parts are cycled through the degreaser, PCE needs to be added periodically, and the PCE reservoir needs to be cleaned out on occasion. For these reasons, it is unacceptable that Madison-Kipp has not investigated soil and soil vapor under and around the degreaser locations for PCE contamination.

Madison-Kipp did not investigate under central trench or laterals

There is a trench or pipeline underneath the floor of the Madison-Kipp building that carried either cooling fluids or cutting fluids. The trench or pipeline runs north-to-south across the central portion of the building. The pipeline was connected to a network of laterals leading from Madison-Kipp's various machines. It should have been obvious to Madison-Kipp and its consultants that this pipeline and the laterals should have been investigated for chemical contamination. This is because leaks may have been difficult to detect (thus could have persisted undetected for a long period of time) and leaks from the pipeline would be a potential source for contamination underneath the building. WDNR agrees that the pipeline should be investigated (Schmoller Deposition, 2012, pp. 284-285).

Madison-Kipp did not investigate sanitary or storm sewer pathways

Manmade structures such as buried utility lines and sewers can serve as preferential pathways for contaminant migration in the subsurface. ARCADIS believes that preferential pathways in sewers or utility trenches are not contributing to the offsite migration of contaminated vapors.[8] However, as Mr. Schmoller of WDNR points out, the potential for migration along preferential pathways has not been investigated and he did not even know where the sewer lines run at the site (Schmoller Deposition, 2012, p. 69). It is certainly premature for ARCADIS to conclude that migration along preferential pathways is not a problem prior to conducting an inquiry into this matter. ARCADIS and Madison-Kipp are mistaking a lack of information (because they have not sought to collect it) for a lack of contamination. This is a serious flaw in their reasoning and interpretation of environmental conditions.

[8] Q. Okay. So do you know whether sewers, facilitated flow through sewers or utility trenches are contributing to the vapors detected under the homes in the area? A. To my knowledge, no. (Trask Deposition, 2012, p. 174).

Madison-Kipp contractors only recently began to investigate under the building

One of Madison-Kipp's most egregious omissions since receiving the July, 1994 WDNR letter is its failure to comprehensively test soil and soil vapor under its own building. This is where the PCE degreaser was located. This is where PCB-bearing oil was likely used. This is where the trench or pipeline carried liquid wastes. Only now, in 2012, is this obvious component of the environmental site investigation being performed. If for no other reason, I would have expected Madison-Kipp to carry out such an investigation out of concern about potential exposure of its own employees to toxic chemicals under the building.

OPINION 4. The soil, soil gas, groundwater and vapor/air contamination at and released from this Site and into the Class Area constitute an imminent and substantial endangerment to human health and the environment within the meaning of the Resource Conservation and Recovery Act (RCRA). The imminent and substantial endangerment will persist indefinitely unless effective remedial actions are implemented.

For purposes of my opinion, I have consulted guidance documents, including those prepared by the U.S. EPA. U.S. EPA "Guidance on the Use of Section 7003 of RCRA" states the following with regard to the definitions of imminent and substantial endangerment:[9]

> "An 'endangerment' is an actual, threatened, or potential harm to health or the environment… As underscored by the words 'may present' in the endangerment standard of Section 7003, neither certainty nor proof of actual harm is required, only a risk of harm… Moreover, neither a release nor threatened release, as those terms are used in CERCLA, is required… No proof of off-site migration is required if there is proof that the wastes, in place, may present an imminent and substantial endangerment."
>
> "An endangerment is 'imminent' if the present conditions indicate that there may be a future risk to health or the environment… even though the harm may not be realized for years… It is not necessary for the endangerment to be immediate… or tantamount to an emergency."
>
> "Because conditions vary dramatically from site to site, there is no comprehensive list of factors that EPA should consider when determining whether conditions may present an imminent and substantial endangerment… Some of the factors that the Regions may consider appropriate are: (1) the levels of contaminants in various media; (2) the existence of a connection between the solid or hazardous waste and air, soil, ground water, or surface water…"

There can be no dispute that the industrial chemicals used and released at Madison-Kipp such as PCE, PCBs, and PAHs are hazardous wastes, within the meaning of RCRA. Madison-Kipp engaged in the handling, storage, transportation and disposal of this hazardous waste.

[9] U.S. EPA, October 20, 1997, Memorandum, Subject: Transmittal of Guidance on the Use of Section 7003 of RCRA.

The contaminants PCE, PCBs and PAHs - - emanating from Madison-Kipp's property - - have been found throughout the Class Area (and beyond) in soil, soil gas, subslab vapor and, for some homes, in the indoor air. PCE from Madison-Kipp likewise contaminates the shallow groundwater just 20 or so feet below these homes, and the deeper groundwater aquifer below that. In short, toxic chemicals from Madison-Kipp contaminate, or threaten to contaminate, virtually every dimension of the surrounding neighborhood, including the Class Area.

Of the many scientifically significant facts here, the most significant are these:

(1) Throughout the relevant time period, Madison-Kipp's neighbors in the Class Area lived immediately adjacent to the facility – literally just feet away.

(2) Each of the relevant chemicals is either a known or potential carcinogen, and thus poses a potentially serious threat to humans, especially children. The Expert Report of Dr. David Ozonoff, on which I explicitly rely here, articulates very clearly that, for example, PCE is potentially dangerous to humans in any concentration.

(3) Each chemical has long ago reached the neighborhood properties, often via multiple means. In environmental terms, this means that the "pathway" is complete, *i.e.*, the chemicals have found a way - - via groundwater, gas, wind, water run-off, etc. - - to travel from Madison-Kipp to neighborhood properties. Also, since Madison-Kipp has thus far failed to foreclose any of these pathways, the large volume of toxic chemicals today contaminating Madison-Kipp's property continue to travel one or more of these pathways to the Class Area and beyond.

(4) The concentrations of chemicals remaining on Madison-Kipp's property, which continue to travel via already well-travelled pathways to the Class Area and beyond, are very high, in some cases dangerously so (in soil, soil gas and groundwater).

These scientific facts, discussed more fully below and throughout this report, show that the abundant toxic chemical contaminants in both the Class Area (and beyond), and on Madison-Kipp's own property, easily satisfy the standard articulated in RCRA, *i.e.*, "may present an imminent and substantial endangerment to health or the environment".

Years of chemical releases at Madison-Kipp have caused the imminent and substantial endangerment

For many years prior to 1987, Madison-Kipp discharged large volumes of toxic chemicals to the ground and air on its own property. These releases caused severe contamination on the Madison-Kipp site but the chemicals were also allowed to migrate in the environment to cause high levels of off-site contamination of the soil, soil vapor, and groundwater in the Class Area with VOCs, including PCE, as well as PCBs and PAHs (as described in more detail in Opinions 1-3 of this report). Residents of the Class Area and workers at Madison-Kipp have been exposed to these chemicals for many years and the exposure continues to this day. This constitutes an imminent and substantial endangerment to human health. In addition, the groundwater under and around Madison-Kipp has been degraded to the point that it is unusable for beneficial uses (and will likely remain that way for decades into the future). Well No. 8, a public water supply of the Madison Water Utility is approximately 1,000 feet south of Madison-Kipp and low levels of a breakdown product of PCE has been detected in this well (Wisconsin State Journal, April 23, 2012, "Neighbors worry as toxic plume from Madison-Kipp Corp. nears well," by Ron Seely). According to Joseph Grande of the Madison Water Utility, pump tests showed a hydrologic connection between Well No. 8 and the Madison-Kipp monitoring wells. This threat to the quality of the public water supply constitutes an imminent and substantial endangerment to the environment. The imminent and substantial endangerment is the direct result of the conduct of Madison-Kipp regarding chemical and hazardous waste handling and disposal, as well as its subsequent failure to promptly and adequately address its environmental problems.

Soil and groundwater data collected thus far confirms the release of dense non-aqueous phase liquid (DNAPL) into the groundwater; confirms high levels of dissolved VOC contamination in groundwater plumes extending throughout the Class Area and beyond; confirms the presence of contaminated vapor under the homes in the Class Area; and confirms the presence of PCE, PCBs and PAHs in shallow soil in the residential yards of the Class Area. The operational history of Madison-Kipp and the hydrogeology of the site show that this problem has existed in the Class Area, and has persisted largely unabated, for decades.

Residents in the class area are exposed to Madison-Kipp's toxic chemicals

Madison-Kipp's PCBs have been found in the soil from the yards of 23 of the 32 homes tested in the Class Area and its PAHs have been found in 32 of the 34 yards tested (see Table 1). Madison-Kipp's PCE has been found in soil vapor or subslab vapor for nearly every home tested in the Class Area. Some of the residential properties also had PCE detected in indoor air. This toxic chemical has migrated from

Madison-Kipp's soil and groundwater, through the vadose zone and into the homes. Even where the levels are below the WDNR action level, the presence of PCE shows a continuing invasion, and the pervasive contamination on Madison-Kipp's property just feet away from these homes constitutes an ongoing threat. The fact that chemicals are detected in any amount on the residential properties, coupled with the undisputed presence of contaminated soil in the yards and groundwater under the homes, shows that all of these Class Area properties have been impacted, and remain threatened, by chemicals originally released by Madison-Kipp. Mr. Schmoller has also noted that with the aquifer as shallow as 18 feet below ground surface, groundwater is only about 10 feet below the basements of the nearby homes, thus the VOC groundwater contamination is only separated from the homes by a small interval of overlying soil (Schmoller Deposition,2012, pp. 39 and 44).

As noted by Dr. Ozonoff in his expert report, exposure to PCE at any concentration constitutes a health risk. If Madison-Kipp had conducted a prompt and thorough investigation after it first discharged these chemicals, but in no event later than WDNR's letter in 1994, the impacts on neighbors' homes could have been discovered much earlier than 2011. Although our understanding of the risks posed by vapor intrusion has grown since the 1990s, it was appreciated that vapor intrusion could be a problem at VOC-contaminated sites even before WDNA's 1994 letter. For example, EPA issued guidance documents related to vapor intrusion at contaminated sites as early as 1992 (EPA, 1992, Assessing Potential Indoor Air Impacts for Superfund Sites, EPA-451/R-92-002; EPA, 1993, Options for Developing and Evaluating Mitigation Strategies for Indoor Air Impacts at CERCLA Sites, EPA-451/R-93-012).

Based on my experience with VOC sites and vapor intrusion, this exposure pathway could easily have been discovered and addressed in the 1990s; thus, residents of the Class Area have endured at least an extra decade of exposure to these toxic chemicals as a direct consequence of Madison-Kipp's inaction. Due to the difficulty in cleaning up the widespread contamination (considering the particular hydrogeologic conditions in Madison and the recalcitrant nature of the chemicals; see Opinion 5) residents in the Class Area will continue to be threatened with exposure to Madison-Kipp's chemicals for many years into the future.

Madison-Kipp has not adequately characterized the nature and extent of the contamination

As noted in the depositions of the DNR regulator, Mr. Schmoller, and ARCADIS project manager for the investigation and remediation of the site, Ms. Trask, the horizontal and vertical extent of the groundwater contamination has not been defined. The sources and source areas of the PCE contamination at Madison-Kipp have not been fully defined and the extent of the soil contamination has not been defined. This is not

all that is lacking in the investigation. Since 1994 when Madison-Kipp was first required by WDNR to investigate its environmental problems it has:

- Failed to delineate the extent of PCE contamination in soil on its site;
- Failed to delineate the extent of PCE contamination in offsite soil, including in the Class Area;
- Failed to delineate the extent of PCB contamination in soil on its site;
- Failed to delineate the extent of PCB contamination in offsite soil, including in the Class Area;
- Failed to delineate the extent of PAH contamination in soil on its site;
- Failed to delineate the extent of PAH contamination in offsite soil, including in the Class Area;
- Failed to delineate the extent of PCE contamination in soil vapor on its site;
- Failed to delineate the extent of PCE contamination in offsite soil vapor, including in the Class Area;
- Failed to delineate the extent of PCE and other VOC contamination in shallow groundwater;
- Failed to delineate the extent of PCE and other VOC contamination in deep groundwater.

In summary, Madison-Kipp has not completed an adequate characterization of a single component of its multi-component environmental problem. It faces a major effort just to accomplish the state's 1994 requirement to "determine the horizontal and vertical extent of contamination" and an even greater task of actually cleaning up this problem. Mr. Schmoller of WDNR acknowledged that there is still uncertainty about all the sources of the contaminated soil vapor on the Madison-Kipp property. The off-site vapor contamination is due partly to vapor migration from contaminated soil and due partly to off-gassing from contaminated groundwater. I agree with Mr. Schmoller that Madison-Kipp has not determined the relative contribution from each of these sources to the vapor intrusion problem (Schmoller Deposition, 2012, pp. 33, 39). This uncertainty still persists, even after Madison-Kipp has had at least 18 years to evaluate these issues. There is also uncertainty as to the lateral and vertical extent of groundwater contamination. In fact, neither Madison-Kipp, nor WDNR seem to have even determined which way groundwater flows in the various aquifer zones under this site; nor have they determined which depth intervals of the aquifer are most transmissive (which are the depth intervals in which PCE and other VOC contamination is likely to have spread the farthest). If the scientist doesn't know which way groundwater is flowing (or how fast it is flowing), he/she can't know where to look for off-site groundwater contamination because dissolved contaminants typically migrate passively in the direction of groundwater flow.

Even the work that's been accomplished to date was frequently too little, too late. For example, many homes have only been tested for subslab vapor or indoor air one or two times. This is generally insufficient to measure the range of exposure faced by residents, thus insufficient to measure the risk

posed by such exposure. A single sampling event represents a measurement at a certain place and a certain time. Vapor measurements for volatile chemicals such as PCE are highly variable, meaning they can (and do) go up and down dramatically in response to wind, atmospheric pressure, open doors and windows, and operation of heating and cooling systems, among other things. VOC concentrations found under homes will vary temporally, just as the weather changes dramatically from one season to another and even from one day to another. As an analogy, a single temperature reading in Madison on a warm, sunny July day doesn't tell us much about what the weather will be like six months later, in January. In other words, a single measurement of a widely-varying parameter (such as temperature in Madison, WI or VOC vapor concentrations in a home) is not predictive of future conditions. In the same way, one or two subslab or indoor air measurements (even if they are low) can give a false sense of security because they are not able to capture the full range of variation that might be experienced over time and under different conditions. However, the fact that high concentrations of PCE and other VOCs have been found in on-site groundwater indicates that Class Members will continue to be exposed to and/or threatened by PCE vapors. (For additional information on the high levels of PCE found in groundwater at the site, see Opinion 5.)

By comparison, I looked at the historical soil gas numbers collected by RJN Environmental Services, LLC–Soil Vapor Sampling Locations and Data 2005-2009 on the DNR website. The Wisconsin Indoor Air Action Level for PCE is 6.4 ppbV. The subslab action level is 10 times this value, or 64 ppbV.[10] In 2005 at Madison-Kipp location VP-1N, the PCE ranged from a low of 26,018 to a high of 43,266 ppbV; in 2006 from a low of 12,424 to a high of 36,619; in 2007 from a low of 1,100 to a high of 40,000; in 2008 from a low of 890 to a high of 4,800; in 2009 from a low of less than 50 to a high of 1,300 ppbV. Under one of the homes in the Class Area, the PCE concentration ranged from 21 to a high of 1,100 at a single location. As noted on page 168 of Ms Trask's deposition, she was not even aware of the soil gas variability much less able to explain it. Clearly the PCE soil gas concentrations are extremely variable demonstrating the need for a more robust monitoring program, such as continuous soil gas monitoring, that can better capture the temporal variability of the vapor intrusion phenomenon.

Neither Madison-Kipp nor its environmental consultants have made an effort to ascertain how much PCE it used and how much it released over the years. Similarly, there is no evidence of any effort to catalog how much PCB was used at the site or the mass of PAHs that were used and/or generated from operations at the site. In my experience, a survey of historical records and practices is standard practice because it

[10] In my experience, this is rather high. For example, the Human Health Soil Gas Screening Level for PCE in California is 26 ppbV.

can be very helpful to define the magnitude of the releases, to help the environmental scientist define the likely scale of the subsurface problem, and to focus the investigation on areas most likely to have been impacted.

Madison-Kipp's delay has allowed the contamination to spread offsite and allowed the problem to get worse

In its original 1994 letter ordering Madison-Kipp to investigate and clean up its contamination, WDNR warned: "The longer contamination is left in the environment, the farther it can spread and the more difficult and costly it becomes to cleanup." By leaving contamination in the ground all these years, denying the problem and focusing on saving money, Madison-Kipp has allowed WDNR's prediction to come true and it is now faced with a more costly and complex cleanup than if it had listened to WDNR. Neighbors' exposure to Madison-Kipp's chemicals also could have been discovered many years earlier, which could have led to earlier efforts to mitigate this risk to human health. Instead, resident's exposure to Madison-Kipp's chemicals continued unabated for the 18 years of inadequate environmental work at this site (not to mention the many years prior to 1994 that the contamination existed but was not known to WDNR).

Now that the contamination has spread into the deeper bedrock aquifer and extends offsite, it will take many years to clean up. In fact, WDNR's project manager Mr. Schmoller indicated that it certainly would be a couple of decades before he would expect the groundwater contamination to be cleaned up (Schmoller Deposition, 2012, p. 51).

OPINION 5. Because Madison-Kipp has no comprehensive plan to complete the investigation or to clean up the contamination, and has failed to confront the complexity and challenges of remediating the widespread contamination it has caused, additional remedial measures are required to characterize the site and mitigate the imminent and substantial endangerment to human health and the environment.

As of this writing, there is no comprehensive scope of work for filling data gaps and completing the much-needed site characterization work for the soil, soil vapor, or groundwater at Madison-Kipp and beyond (Schmoller Deposition, 2012, p. 156). For example, dioxins are human carcinogens that are known to be associated with foundry operations and, to my knowledge, Madison-Kipp has not done any soil testing at all for dioxins.

When a regulatory agency requires a responsible party to "determine the horizontal and vertical extent of contamination," this typically means conducting sampling programs until non-detects are found and the true edge of the contaminant plumes can be mapped out. In my experience with numerous local, state and

federal regulators, this is generally a requirement regardless of ultimate cleanup standards that might be applied for the subsequent remediation program. Exhibits 3 and 4 show the City of Madison's interpretation of PCE in shallow and deep groundwater, respectively. With regard to deep groundwater, Exhibit 4 shows there is no data at all to the west and east of Madison-Kipp so the extent of the PCE plume at this depth interval is completely unconstrained. There are monitoring wells north and south of the site, although all but one of these wells still contain PCE (at levels between 5 and 50 ug/L). Thus, the extent of the plume has not been fully delineated to the north or south.

The data show that PCE was released at the site and likely infiltrated into the groundwater in a "free product" or DNAPL (dense non-aqueous phase liquid), which is the most chemically potent form of PCE and the most difficult and expensive to clean up. DNAPL is a term used to describe the differences (both physical and chemical) between a liquid chemical (like PCE) and water (EPA, March 1991, Dense Non-aqueous Phase Liquids, Groundwater Issue). Chlorinated solvents like PCE and TCE have a density greater than water. Promoted by gravity, DNAPL migrates downward through preferential or permeable pathways such as soil pores, rock fractures or subsurface utility lines. By its very nature, DNAPL will find and then migrate through these preferential pathways.

EPA and other practitioners commonly use the so-called "1% rule" to indicate the presence of DNAPL in the subsurface. Briefly, the 1% rule states that if a chemical is detected in dissolved form in groundwater at a concentration corresponding to 1% or more of the solubility of that chemical in pure water, then it is likely that the pure phase (i.e. DNAPL) is present nearby.[11] The 1% benchmark for PCE corresponds to a concentration of approximately 1,500 ug/l. Evidence of the presence of DNAPL is found in monitoring well MW-5D. From August 2007 through December 2008, the concentrations for PCE in MW-5D was between 3,100 ug/l and 4,600 ug/l, which is consistently above the 1% rule. In fact, the concentrations at Madison-Kipp have been as high as 3% of this benchmark. Monitoring well 5D is screened in fractured bedrock. The National Academy of Sciences has indicated that fractured rock is the most complex of all hydrogeologic environments for characterizing and remediating DNAPL. As a member of the TAG (Technical Advisory Group) for the Interagency DNAPL Consortium (DOE, DOD, NASA, EPA), I am very familiar with DNAPL characterization and remediation.

The federal drinking water standard or MCL for PCE is 5 ug/L (or parts per billion). However, the MCLG (maximum contaminant level goal) is zero. MCLGs are public health goals and EPA seeks to establish the

[11] This test is employed because it is often difficult to directly observe DNAPL in the subsurface with conventional investigation techniques.

legally enforced MCL as close as possible to the MCLG.[12] This year, PCE has been detected in groundwater at the Madison-Kipp site at levels up to 2,600 ug/L (ARCADIS, June 1,2012, Bi-Monthly Progress Report, Madison-Kipp Corporation Site, 201 Waubesa Street, Madison, Wisconsin) which is lower than historical highs but still more than 500 times higher than the MCL and obviously much higher than the MCLG of zero. Because this concentration is in groundwater, it is likely to move off-site, and into the Class Area. It is troubling that the ARCADIS project manager was not even aware that the MCLG for PCE is zero (Trask Deposition, 2012, p. 163). It is hard to demonstrate a credible approach to groundwater cleanup if your environmental project manager is not aware of the regulatory framework and the likely cleanup goals.

The soil and groundwater contamination in the Class Area may be remedied to an acceptable level only through many decades of effort. This is because toxic chemicals have been transported off the Madison-Kipp Site by groundwater, windblown dust and sediment transport during rains and floods. This gave rise to a widespread and complex distribution of offsite contamination that will be difficult to map out and even more challenging to clean up.

Even after 18 years, many very basic facts are not known about the nature and extent of contamination under Madison-Kipp and the surrounding neighborhoods. ARCADIS, the characterization and remediation consultant, under contract to Madison-Kipp's law firm, has testified through Ms. Trask that the sources of the VOC contamination at Madison-Kipp have not been defined, that the soil contamination has not been fully defined, and the indoor VOC pathway has not been defined. ARCADIS does not know how much PCE is tied up in the soil on the Madison-Kipp property (Trask Deposition, 2012, pp. 159-160). Regarding groundwater, ARCADIS has also acknowledged that it does not know how much PCE is in the groundwater under the Madison-Kipp site or in the plume emanating from the Madison-Kipp site (Trask Deposition, 2012, pp. 159-160). In this section, I provide opinions about what additional investigation is still needed and provide a general remediation strategy for this site.

Additional groundwater investigation is required

The WDNR regulator (Mr. Schmoller), the former Madison-Kipp Environmental Manager, (Mr. Lenz), and the ARCADIS Project Manager for the environmental characterization and cleanup (Ms. Trask) have all acknowledged that the horizontal, and vertical extent of groundwater contamination has not been defined even 18 years after the 1994 letter requiring Madison-Kipp to characterize the groundwater

[12] The MCL for a contaminant is sometimes higher than the MCLG (as is the case for PCE) because of difficulties in measuring small quantities of a contaminant, lack of available treatment technologies or if the cost of treating water to the level of the MCLG would be prohibitive.

contamination (Schmoller Deposition, 2012, p. 103; Lenz Deposition, 2012, p. 105; Trask Deposition, 2012, pp. 159-160).

The most glaring deficiency in the groundwater investigation is Madison-Kipp's failure to search for DNAPL in the aquifer. If the mass of DNAPL is large (as it must be, considering the amount of PCE that must have been dumped over the years) then it poses an essentially perpetual threat to groundwater quality, because of the large mass of contaminant concentrated in a small area. In this case, mapping out its location and depth in the subsurface is a major factor in understanding contaminant fate and transport and must be better understood in order to design an effective remediation strategy. I coauthored a pair of papers on this issue in 2001and 2002 (Kram, Keller, Rossabi and Everett, DNAPL Characterization Methods and Approaches, Parts 1 and 2). My coauthors and I explained in these papers that failure to remove or treat residual DNAPL may result in continued, long-term contamination of the surrounding groundwater which in turn means the long-term contamination of Class Member homes.

DNAPL characterization at this site should include 10 or more cone penetrometer (CPT) probe locations distributed across the Madison-Kipp property to a depth of no less than 100 feet in the areas historically known to have been dumping locations and/or areas with high PCE in shallow soil. In addition to fine-scale lithologic data, the CPT probes should include advanced sensors such as laser induced fluorescence (LIF)[13] or Raman Spectroscopy. Depending on the results of the initial set of CPT probes, Madison-Kipp should be prepared to test at additional locations if needed to more fully delineate DNAPL occurrences or other contaminant or hydrogeological conditions.

The specific flow pathways of contamination in fractured rock hydrogeology can be very different than regional groundwater flow estimated from groundwater elevations and groundwater contours. Since the fractured bedrock characterization has not been satisfactorily completed, the deep groundwater flow directions are not known with certainty. If one compares the PCE isocontours in Deep Groundwater Wells prepared by the City of Madison Engineering on 2/27/12 (Exhibit 4 of this report), one sees that the 50 ppb contour is a solid line yet there is no data in an east or west direction which would bound this contour and give any credibility to the solid line representation as definitive of the dimensions of the plume. Further, the 5 ppb isocontour is a dashed line that appears almost totally devoid of any deep groundwater data which would bound this isocontour line thus there is no defensible credibility to its projection.

[13] LIF is generally used to identify LNAPL at petroleum hydrocarbon sites: it cannot detect pure PCE. However, when PCE is used in degreasing operations (such as at Madison-Kipp) the PCE released to the environment is usually comingled with substantial petroleum residual from the degreasing operations, thus LIF is a useful tool for this site.

Therefore the true extent of the plume at the 5 ppb PCE contour is poorly defined in all four directions. This representation of the deep groundwater contour lines, when compared to the PCE isocontours in shallow groundwater developed by the City of Madison Engineering on 2/29/12, is very different (see Exhibit 3). In the shallow PCE contour map the 50 ppb contour is represented as a dashed line and the legend identifies the dashed lines as approximate. Further, the 5 ppb shallow contour line is represented as a dashed line and appropriately recognized in the legend. The 5 ppb isocontour is poorly defined and will require further characterization. The rational for further characterization is obvious when one compares the shallow groundwater map with the deep groundwater map. Clearly the rate of contamination migration is faster at some depths than others.

The lithology and compositional data gleaned from the CPT probes recommended above should provide better insight into the depth intervals of interest for mapping the dissolved groundwater plume. Depths of interest correspond to depths in which DNAPL is detected in onsite CPT probes and/or depths with especially high hydraulic conductivity. This is the combination of subsurface features that lead to the highest contaminant transport potential, thus have the potential for hosting the most extensive groundwater plumes. If existing wells are not screened in the depth(s) of interest, then new wells will need to be drilled even at the existing locations. In addition to redrilling existing locations, at least three multi-depth well clusters should be installed west of Waubesa Street; at least three multi-depth well clusters should be installed east of Marquette Street; at least two multi-depth well clusters should be installed north of well MW-10; and at least two multi-depth well clusters should be installed south of MW-6. Madison-Kipp should also be prepared to install more wells at a greater distance from the Site if data from the new wells show that the contamination extends beyond the new wells.

Additional soil investigation is required

The degree of contamination under the building is perhaps the most neglected data gap regarding onsite soil conditions at Madison-Kipp. WDNR agrees with my conclusion that this is a significant data gap (Schmoller Deposition, 2012, p. 246-247). I understand that ARCADIS recently has conducted some sampling under the building. This was an obvious place to look for contamination, and there is no excuse for waiting so long to conduct this essential component of the environmental investigation. The results of this sampling are not yet available, but I believe the scope of the work – 42 borings, I am told – will prove insufficient to adequately characterize a large industrial building such as Madison-Kipp. In my opinion, approximately 100 additional soil sample locations will be needed under the building. Soil samples should be analyzed (at minimum) for VOCs (including PCE), PAHs, total petroleum hydrocarbons, metals and PCBs. Results of the recent, modest round of sampling can be used as a guide for determining

appropriate locations for the more thorough soil investigation that I believe is needed. Another priority is that there needs to be a soil testing program for dioxins at onsite and offsite locations. This is because dioxins are human carcinogens that are known to be associated with foundry operations and, to my knowledge, Madison-Kipp has not done any soil testing at all for dioxins.

The on-site soil investigation for PAHs needs to be expanded in the southern parking lots (impacts resulting from oil spreading for dust suppression and also from PAHs likely emitted from Madison-Kipp's exhaust fans and stacks). In my opinion, this phase of the on-site investigation will require approximately 50 sample locations with samples collected from at least two depths at each location: one surface sample in the upper 6-inches of soil and one sample at a depth of 1-2 feet.

Although numerous off-site soil samples have been collected at the urging of WDNR, this program is far from complete and much more sampling is needed to delineate the extent that Madison-Kipp's various chemicals have invaded the surrounding neighborhoods.

The pattern of offsite soil impacts is likely very complex and difficult to predict because offsite soil contaminants were likely transported by a combination of windblown dust, condensation from PCE vented from the degreaser and sediment transport during rain events and floods. This investigation should include an assessment of prevailing winds in order to better understand the potential distribution of contaminants spread by airborne deposition. In my opinion, the offsite soil investigation should include a minimum of four sample locations on each residential lot, with samples collected from at least two depths at each location (one surface sample in the upper 6-inches of soil and one sample at a depth of 1-2 feet). If contaminants are detected in the deeper sample, then a third sample should be tested from that location, from a depth of 2-3 feet. All soil samples should be analyzed (at minimum) for VOCs (including PCE), PAHs, total petroleum hydrocarbons, metals and PCBs. Any residential lots that have not been sampled in at least four locations and tested for all contaminants of concern should be resampled in order to bring the soil sample density and analyte list up to the sampling protocol proposed here. The rationale for this sampling program is summarized below. Windblown contaminants can readily travel hundreds of feet or more from their emission source. For this reason, the area of investigation needs to be expanded and soil should be tested on all residential and commercial parcels within 600 feet of the Madison-Kipp property boundary in all directions[14]. If this off-site investigation is done in concentric phases, it may be possible to

[14]Further study of prevailing winds may allow a refinement of the shape of the off-site sampling area. According to the Wisconsin Wind Atlas (Naber-Knox, 1996) the prevailing wind in Madison blows out of the west-northwest in the winter and out of the south in the summer months. Contaminants are expected to travel farther from the source in the direction of the prevailing winds.

scale down this phase of the work by interpreting and responding to results from earlier rounds of sampling. For example, if all properties 500 feet from Madison-Kipp are found to be clean, then the properties 600 feet from Madison-Kipp can be spot-tested with (for instance) just one sample location for each parcel instead of four sample locations. The area for this off-site sampling survey is provided in Exhibit 6.

As of September 2012, PAHs have been found at every off-site property sampled (see Exhibit 7). Madison-Kipp almost certainly released PAHs to the environment. Petroleum-based lubricants used on die-cast molds are partly combusted each time molten metal is injected into a mold. PAHs are formed during this combustion process and would have been vented to the atmosphere. Madison-Kipp's current consultant, ARCADIS, has recommended that cleanup in the neighborhood not be driven by the widespread PAH contamination because the PAHs can originate from numerous sources (including backyard grilling), not just Madison-Kipp. If one wanted to identify the source of the PAHs, there are well known forensic techniques such as hydrocarbon fingerprinting which could have provided insight into the source of the PAHs. It has been known for at least 50 years that benzo(a)pyrene is a potent chemical carcinogen. This is one of the PAHs identified in the soil at neighboring properties. Since PAHs are a substantial human health risk, it is unacceptable that ARCADIS would find elevated PAHs everywhere it looked, yet try to trivialize the issue by suggesting the PAHs are the result of back yard grilling activity or otherwise blaming the neighbors. Clearly further forensic inquiry was required in this situation before ARCADIS could reach such a conclusion, especially in the light of compelling evidence showing that Madison-Kipp is the source of the PAHs. For example, ARCADIS could have looked at the Madison-Kipp oil and gas purchases on a year-round basis to determine if the PAHs released from the stacks and vents at Madison-Kipp were cyclic..

The PAHs were identified nearly everywhere they were sampled and the distribution of PAHs can be attributed to emissions from Madison-Kipp's die cast operations and spreading of hydraulic fluids containing the PAHs, PCE and PCBs on the gravel topped parking lots towards the north central part of the facility and the (yet to be characterized) old parking lot in the southwest part of the facility (bearing in mind however that the southwest part of the facility parking lot has been partially covered over by a building). I personally walked along the very narrow walkway between the Madison-Kipp facility and homes at 269-233 East Waubesa Street. While standing behind the home at 233 E. Waubesa Street, I took photos of large exhaust fans at Madison-Kipp (see Photo 22) which clearly showed they were dripping with petroleum residues. I further looked at the concentrations of PAHs in the backyards of the homes immediately adjacent to these exhaust fans. The highest concentrations of PAHs are located in the yards

directly adjacent to the exhaust fans, strongly suggesting that emissions from the fans were a source of the PAHs. ARCADIS, as an advocate for Madison-Kipp, is trying to avoid addressing the PAH problem, which would reduce the cost of further investigation and remediation. After completion of the off-site soil testing program referenced earlier in this report, all residential yards with PAH above WDNR's action level, should be excavated to remove the impacted soil and replaced with clean backfill.

During Madison-Kipp's operational history, polychlorinated biphenyls (PCBs) were widely used as a dielectric and in coolant fluids, for example in transformers, capacitors, and electric motors. Due to its environmental toxicity and classification as a persistent organic pollutant, PCB production was banned in the US in 1979 and internationally, by the Stockholm Convention on Persistent Organic Pollutants in 2001. According to USEPA, PCBs have been shown to cause cancer in animals and there is also evidence that they can cause cancer in humans. A number of peer reviewed health studies have also shown a causal link between exposure to PCB and non-Hodgkin's lymphoma.

A review of PCB detections as of September 2012 in soil indicates that PCBs were detected almost everywhere they were analyzed (see Exhibit 8). For example, every home between 102 and 154 West Marquette Street (with one exception) had hits of PCBs in its soil. Based on the toxicity of PCBs it is unconscionable that further PCB sampling was not conducted on the east side of Marquette and possibly further into the neighborhood. As discussed earlier, it has been acknowledged that the PCBs were contained in the hydraulic fluids that were spread on the gravel parking lots to control dust. The proximity of these lots (which I have walked) to the Class Area homes supports my opinion that overland flow contributes PCBs to the neighboring properties during rainfall events, flooding events and also by windborne dust. I find it disconcerting that PCBs were also found at every home, with one exception, sampled along the east side of Waubesa Street. Although the homes on the east side of Waubesa Street appear not to be down gradient of the eastern parking lot the same may not be said of the southwest parking lot. The southwestern corner of Madison-Kipp requires further investigation to determine if overland flow transported PCBs (and/or other chemicals) into the yards of homes on Waubesa Street. An investigation needs to be done to determine if the large vents that were dripping oil adjacent to the home at 233 E. Waubesa were spreading PCBs in atomized particulates. To date, I have not seen any discussion of the potential impacts of Madison-Kipp's large smoke stacks or large vents relative to contaminant distribution. The soil investigation proposed here and summarized in Exhibit 6 will address this concern.

Additional vapor sampling is required

Because the air in Class Area homes is being impacted by Madison-Kipp's volatile contaminants, it is obvious that indoor air quality in the facility itself is impacted or threatened. Soil vapor, subslab vapor

and indoor air sampling should be conducted in and under the Madison-Kipp facility. I recommend no fewer than 10 sets of vapor data be collected in and under the facility at widely-spaced locations, including any VOC hot spots identified from the soil sampling program discussed above. Each location should consist of a shallow soil vapor probe at a depth of approximately 5-feet, a deeper soil vapor probe above the water table, a subslab vapor probe and an indoor air sample near each cluster of probes. This work will help WDNR understand the exposure risk to Madison-Kipp workers from Madison-Kipp's chemicals.

Regarding off-site vapor measurements, the program needs to be expanded in geographic scope and it needs to be expanded to collect more time-series data. WDNR has, as of September 6, 2012, provided a summary of where PCE has been detected in subslab and/or indoor air (see Exhibit 9). Of the 51 residential properties sampled for VOC vapors, all but two had detections of PCE. Further, all the residential properties sampled on the northern part of Waubesa Street; all the residential properties sampled on the northern part of Marquette Street; and the residential properties sampled on the north part of Dixon Street, all showed hits for PCE. Clearly, the northern extent of the vapor contamination on Marquette, Waubesa, and Dixon Streets, has not been defined. If one looks at the vapor detections along Dixon Street, both north and south of Fairview Street, VOC vapors were detected in every location (with one exception). Clearly the easterly extent of the vapor plume has not been characterized at this stage. If one looks at the only sample taken on the east side of Cory Street it is clear that the western extent of the vapor contamination has not been characterized. If one looks at the home at 266 West Waubesa, we can see that a vapor mitigation system has been installed due to the presence of VOCs. However, none of the homes across the street or south of 266 Waubesa have been evaluated. If one looks at the southernmost homes on Marquette Street and Dixon Street that have been sampled, it is clear that PCE vapors have been detected. As such, further investigation of PCE vapors needs to be extended south on Marquette Street and south on Dixon Street. Based on information available to me, no samples have been taken along Atwood Avenue. The vapor sampling program needs to be expanded to the north, south, east, and west to better define the extent of Madison-Kipp's vapor plume and to better quantify the degree of impact on neighboring residential properties. According to ASTM Standard E2600, Vapor Encroachment Screening on Property Involved in Real Estate Transactions, a vapor encroachment screening for a property should include an evaluation of areas of concern up to 1/3 mile away as possible sources of vapor encroachment. I don't believe it's likely that Madison-Kipp's vapor contamination has spread as far as 1/3 mile from the facility, but at minimum, the next residential blocks out from the previous off-site sampling area should be tested, as shown on Exhibit 9.

At most offsite locations, there have been (at most) two vapor samples collected. Merely two samples are inadequate for determining the long term risk of VOC exposure at the neighboring properties. Recent guidance on vapor intrusion now focuses on the importance of time series data for vapors when trying to determine human health risk. Research on temporal variability of vapor concentrations was recently published in the peer reviewed Journal of Remediation, Winter 2011 edition. I was a co-author of that paper with Dr. Mark Kram and Dr. Peter Morris. The paper entitled, "Dynamic Subsurface Explosive Vapor Concentrations: Observations and Implications" is one of the fundamental papers on the dynamic behavior of subsurface vapors. This research concluded that parameters such as temperature and barometric pressure have a dramatic impact on the concentration of subsurface soil gases and their variability over time.

As a pilot program, I recommend that three to five of the homes with highest VOC detections in shallow soil or subslab vapor and three to five of the homes with the lowest VOC detections be equipped with continuous monitoring equipment. These homes should be monitored on a continuous basis for approximately one year in order to measure the true temporal variability in contaminant concentrations under neighbors' homes. After reviewing data from the pilot study, more informed decisions can be made regarding the need to equip more homes with continuous monitoring instruments or with vapor mitigation systems. The information currently available is incomplete but it suggests that all homes in the Class Area and beyond are threatened by unacceptably high levels of vapor contamination. Until the pilot program is completed and temporal variability of vapor contamination is better quantified, it is prudent to outfit all homes in the Class Area and all homes beyond the Class Area that have indication of pervasive vapor contamination (see Exhibit 10) with subslab depressurization systems. The decision framework employed by WDNR for approving installation of systems is reasonable except that it does not account for unmeasured temporal variability. For that reason, I recommend revising the decision framework to outfit all homes in the Class Area with vapor mitigation systems.

As noted in the deposition of Ms. Trask, wide fluctuations in the concentrations of PCE have already been noted at some locations associated with the Madison-Kipp site. This fact makes it self-evident that substantially more time series vapor analysis needs to be done on a larger neighborhood footprint.

Proposed remediation program

WDNR has confirmed that there is not a specific remedial option chosen to deal with remediation of soil gas at Madison-Kipp (Schmoller Deposition, 2012, pp. 45, 117). ARCADIS has confirmed that there is no comprehensive plan to clean up soil contamination at the Madison-Kipp site and no time frame in mind as to when the contamination might be cleaned up. (Trask Deposition, 2012, p. 154). WDNR has

confirmed that there is no plan for remediation of either onsite or offsite soil at Madison-Kipp (Schmoller Deposition, 2012, p. 116).

A remediation strategy should be based on a firm understanding of the nature and extent of contamination, of the manner of past and present releases (if available) and of transport mechanisms responsible for the spreading of chemicals in each environmental medium. This frame of reference is frequently referred to as a "conceptual model." It is notable (and unfortunate) that neither Madison-Kipp nor ARCADIS have bothered to develop a conceptual model for this case. In my opinion, this is one reason the investigation and remediation has been so haphazard at this site: it has no foundation on an underlying understanding or theory of how the problem was created. The site investigation has not been completed for this site, so it is premature to specify all details of the future remediation program, although enough information is known to provide a general set of recommendations. Once the site investigation work is complete this strategy can be further refined and a formal design and cost estimate can be prepared.

In this section, I have outlined my opinions for a reasonable and effective remediation program for soil, soil vapor, and groundwater at and around the Madison-Kipp Site.[15]

Soil. According to EPA, a presumptive remedy[16] for VOCs in soil is soil vapor extraction (SVE; assuming impacted soils are coarse-grained enough to transmit air under an applied vacuum; EPA, 1995, User Guide to the VOCs in Soils Presumptive Remedy). The most effective remedial technologies for PAHs and PCBs in shallow soil are either excavation or thermal desorption. If there is a risk of human exposure to these chemicals in shallow soil (such as at Madison-Kipp and in yards of the Class Area) then excavation is favored because it can be accomplished rapidly and with higher level of confidence that contaminant concentrations (thus human exposure levels) can be thoroughly and reliably reduced. For on-site soil, SVE is an appropriate technology for deeper soils in the vadose zone (i.e., above the water table) impacted with only VOCs. Shallower on-site soils are more likely to be impacted with multiple contaminants. This is because both PCBs and PAHs have an affinity to strongly sorb to soil grains and organics in soil, thus are generally restricted to surficial soil[17] and usually do not leach deeply into the soil profile. For this reason, I believe excavation and off-site disposal at a licensed treatment or disposal

[15] With the caveat that the additional site investigation work described above will improve our understanding of site conditions and may prompt me to revise the conceptual model, which in turn may require refinement of this remediation strategy.

[16] A "presumptive remedy" is a technology that EPA or some other authority believes will generally be the most appropriate remedy for a specified type of contamination, based upon past experience.

[17] Assuming the releases deposited PCBs and PAHs directly to the ground surface.

facility is the most appropriate approach for on-site shallow soil. For off-site shallow soil, excavation is the appropriate remediation technique because accomplishing cleanup rapidly should be a high priority for contaminated soil in residential yards where the risk of dermal contact and incidental ingestion are so great.

We do not yet know if deeper (deeper than a couple feet below the ground surface) off-site soil is contaminated with Madison-Kipp's VOCs. Deeper soil impacts would likely be restricted to residential properties immediately adjacent to Madison-Kipp because the transport mechanism for this type of occurrence would be lateral transport in the vadose zone along lithologic discontinuities and/or transfer of contaminants from groundwater to overlying soil and these transport mechanisms are generally capable of only limited lateral spreading. If deeper soil contamination is discovered in offsite locations, then the SVE program should be extended to cover these areas.

Soil Vapor. Contaminated soil vapor on Class Area residential properties is a symptom of unmitigated VOC contamination of underlying or nearby soil and groundwater. Thus (in the long term) cleaning up VOCs in soil and groundwater will reduce the risk of vapor intrusion. In my opinion, it will take many years if not decades to complete the soil and groundwater cleanup at this site (even if Madison-Kipp changes its behavior and moves forward with a greater sense of urgency). Therefore, it is clear that interim (but robust) remedial measures are needed to protect homes from vapor intrusion into the foreseeable future.[18] The residential vapor mitigation systems need to be reliable and, at the least, each home identified in Exhibit 10 to this report should have a mitigation system.

We do know that mitigation systems have been sporadically provided on both sides of Waubesa and both sides of Marquette Street (see Exhibit 10). Further, we note that the northernmost properties on Waubesa, namely, 233 East Waubesa and 234 West Waubesa have mitigation systems (as represented by the WDNR September 6, 2012 map titled, Madison-Kipp Vapor Sampling Status). Further, as we look at the southern extent of Waubesa Street we see that 266 West Waubesa and 257 East Waubesa have vapor mitigation systems. The risk of vapor intrusion at 266 West Waubesa is virtually identical to the risk of vapor intrusion faced by the next-door neighbors. The fact that next-door neighbors have had lower detections may be an artifact of the inadequate sampling program. For this reason, all of the properties interspersed between homes that have already been equipped with mitigation systems should also be equipped with their own mitigation systems. By the same token, vapor mitigation systems were installed

[18] In addition, when data become available regarding VOCs under the Madison-Kipp building, we will be able to evaluate whether onsite vapor mitigation measures will be needed to protect Madison-Kipp's workers. Considering the previous findings in on-site soil and off-site soil vapor, there is a strong likelihood that this will be the case.

at the northernmost home on the east side of Marquette, yet several homes on the northwestern side of Marquette do not have mitigation systems. If one looks at the homes at 162-146 Marquette Street, it's clear that every home has a mitigation system yet homes immediately across the street do not have mitigation systems.

Based on the WDNR criteria for the installation of mitigation systems, I believe that a more complete and more representative subslab, and/or indoor air investigation would result in substantially more homes requiring mitigation systems. I base this recommendation on my many years of research dealing with soil gas migration. For approximately 15 years, I was the Director of the Vadose (soil) Zone Monitoring Laboratory at the University of California at Santa Barbara. In my laboratory we worked extensively on developing an understanding of soil gas migration through variably water saturated soils. In fact my first graduate student developed his Master's thesis researching soil vapor migration as a function of variable soil moisture contents. I note this point relative to soil moisture effects on soil gas migration because when I visited the homes in the Madison-Kipp neighborhood, I noted that some vapor mitigation systems were located directly adjacent to downspouts from the roof as noted in photo 28. These vapor depressurization systems will not work if there are high soil moisture levels such as would be expected in soils under downspouts after rainstorms. As a result, vapors could enter the home from areas further away from the downspouts. This is an example of why the mitigation systems need to be properly designed and installed and periodic subslab vapor and indoor air monitoring as well as periodic operational checks of these systems are required for these homes in order to confirm the reliability of the systems.

Groundwater. WDNR has confirmed that there is not a specific remedial option chosen to deal with either shallow or deep groundwater at the Madison-Kipp site (Schmoller Deposition, 2012, pp. 45, 104). As noted above, cleaning up DNAPL in fractured bedrock is among the most difficult challenges in subsurface remediation. It will require many years and considerable funds to mitigate this serious environmental problem. I recognize that Madison-Kipp carried out a pilot program for chemical oxidation using permanganate and the results were promising. This or similar in-situ chemical oxidation technology is probably appropriate as a component of the groundwater remediation program for this site. However, to adequately treat contaminants from the widespread dumping and to account for uncertainties in contaminant distribution in the subsurface, the in-situ oxidation system would need to blanket essentially the entire Madison-Kipp site (including under the building). Further pilot testing can better refine such parameters as radius of influence for injection wells, but an initial estimate is that injection wells would need to be spaced at approximately 50-foot intervals. This would require approximately 120 wells spaced evenly across the site for injection of the oxidation compounds. However, we do not yet know how much

DNAPL is still present in the subsurface. If the proposed CPT/LIF investigation uncovers a large volume of DNAPL in or near the aquifer and if the DNAPL has accumulated in dead-end fractures or other portions of the porous medium that cannot be readily penetrated by the oxidation chemicals, then in-situ chemical oxidation would not work and six-phase heating would need to be applied in the high-concentration source areas of the aquifer. Six-phase heating is very expensive but it is one of the few (if not only) remediation technologies that can address the exceptional challenges faced at this site in the event in-situ oxidation is found to be insufficient.

Because of uncertainties in the groundwater flow direction, heterogeneity of the aquifer and variability of transmissivity of different aquifer zones at different depths, I believe it is important to include containment as a component of the groundwater remediation program in addition to in-situ oxidation (or six-phase heating). Groundwater containment is accomplished by pumping groundwater from one or more extraction wells in order to reverse the local groundwater gradient and prevent contaminants from spreading farther away from the site. This technique has the added benefit of recovering some contaminant mass from the pumped groundwater, which would be treated in an above-ground treatment system and discharged under permit, either to a storm sewer, sanitary sewer or to surface water.

Section 3. References Cited

ARCADIS, 2012, Bimonthly Progress Reports, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

ARCADIS, 2012, Bedrock Characterization Work Plan, Madison-Kipp Corporation, Madison, Wisconsin.

ARCADIS, 2012, Work Plan for Polychlorinated Biphenyl Investigation, Madison-Kipp Corporation, Madison, Wisconsin.

ARCADIS, 2012, September 13, Site Investigation Work Plan Addendum, Madison-Kipp Corporation, Madison, Wisconsin.

ARCADIS, 2012, September 28, Site Investigation Work Plan Addendum, Madison-Kipp Corporation, Madison, Wisconsin.

ARCADIS, 2012, Site Investigation Work Plan, Madison-Kipp Corporation, Madison, Wisconsin.

ARCADIS, 2012, Various Subslab Inspection Reports for properties on Marquette Street, Madison, Wisconsin.

ARCADIS, 2012, Phase I, Soil Vapor Extraction System Construction Summary, Madison-Kipp Corporation, Madison, Wisconsin.

ARCADIS, 2012, Soil Vapor Extraction System Pilot Test Summary and Phase I System Design, Madison-Kipp Corporation, Madison, Wisconsin.

ARCADIS, 2012, Summary of Vapor Sampling Activities, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin (Letter Report).

ARCADIS, 2012, In-Situ Chemical Oxidation Groundwater Pilot Test Work Plan, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

ARCADIS, 2012, Off-Site Soil Investigation Report, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

ARCADIS, 2012, Work Plan for Polychlorinated Biphenyl Recommended Activities, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Best, 2012, Letter to ARCADIS, Confidential Consulting Relationship, Madison-Kipp Corporation, Madison, Wisconsin.

Bradbury, Swanson, Krohelski and Fritz, 1999, Hydrogeology of Dane County, Wisconsin, Wisconsin Geological and Natural History Survey, Open-File Report 1999-04.

Clayton and Attig, 1997, Pleistocene Geology of Dane County, Wisconsin, Wisconsin Geological and Natural History Survey Bulletin, v. 95.

Coleman, Jerome, 2012, Deposition Transcript and Exhibits.

Colten, Craig, 1991, A historical perspective on industrial wastes and groundwater contamination. Geographical Review, v. 81, pp. 215-228.

Colten and Skinner, 1996, The Road to Love Canal, Managing Industrial Waste before EPA, U. Texas Press.

Dames & Moore, 1994, Progress Report and Work Plan for Additional Soil & Groundwater Sampling, Madison-Kipp Facility, Madison, Wisconsin.

Dames & Moore, 1994, Work Plan for Groundwater Investigation at Madison-Kipp Corporation.

Dames & Moore, 1995, Site Investigation Report, Madison-Kipp Facility, Madison, Wisconsin.

Dames & Moore, 1996, Progress Report, Site Investigation, Madison-Kipp Corporation Waubesa Street Facility, Madison, Wisconsin.

Dames & Moore, 1997, Results from Additional Soil & Groundwater Investigation, Madison-Kipp Corporation, Madison, Wisconsin.

Dames & Moore, 1997, Results of Geoprobe Soil Sampling, Modification of Proposed Soil Remediation Strategy and Establishment of Site-Specific RCLs, Madison-Kipp Facility, Madison, Wisconsin.

Dames & Moore, 1999, Project Status Report, Madison-Kipp Corporation, Madison, Wisconsin.

Dames & Moore, 2000, Status Report-Soil Remediation Activities, Madison-Kipp Corporation Site, Madison, Wisconsin.

Folks and Arell, 2003, *Vapor Intrusion-EPA's New Regulatory Initiative and Implications for Industry*.

Kram, Morris and Everett, 2011, Dynamic Subsurface Explosive Vapor Concentrations: Observations and Implications, Journal of Remediation, Winter 2011.

Kram, Keller, Rossabi and Everett, 2001, DNAPL Characterization Methods and Approaches, Part 1: Performance Comparisons, *Ground Water Monitoring & Remediation*, pp. 109-123.

Kram, Keller, Rossabi and Everett, 2002, DNAPL Characterization Methods and Approaches: Cost Comparisons, *Ground Water Monitoring & Remediation*, pp. 42-61

Lenz, James, 2012, Deposition Transcript and Exhibits.

Lyne and McLachlan, 1949, Contamination of Water by Trichloroethylene, The Analyst v. 74, p. 513, Published by the Royal Society of Chemistry (London).

Madison-Kipp Corporation, 2012, Various letters to neighbors with air testing results.

National Research Council, 1994, Alternatives to Ground Water Cleanup.

Oznoff, David, 2012, Expert Report of David Ozonoff, MD, MPH.

Ruekert/Mielke, 2011, Wellhead Protection Plan, Unit Well 8, City of Madison, Wisconsin, Prepared for the Madison Water Utility.

RJN Environmental Services, 2010, Phase I Environmental Site Assessment for the Madison-Kipp facility, 201 Waubesa Street, Madison, Wisconsin.

RJN Environmental Services, 2010, Annual Report, Madison-Kipp Corporation [groundwater and soil vapor monitoring for 2009].

RJN Environmental Services, 2010, Proposed Work Plan, Vapor Probe Installation and Sampling, Madison-Kipp Corporation.

RJN Environmental Services, 2011, Annual Report, Madison-Kipp Corporation [groundwater and soil vapor monitoring for 2010].

RJN Environmental Services, 2011, Soil and Groundwater Sampling, Madison-Kipp Corporation.

RJN Environmental Services, 2012, Various letters to neighbors with results of soil sampling.

RJN Environmental Services, 2012, Madison-Kipp Corporation Soil Sampling and Analyses, Various Marquette Street Properties [includes PCB soil sample results].

Rivett, Feenstra and Clark, 2006, Lyne and McLachlan (1949): Influence of the First Publication on Groundwater Contamination by Trichloroethene, Environmental Forensics, v. 7, pp. 313-323.

RSV Engineering, 2004, Madison-Kipp Corporation Groundwater Monitoring Report.

RSV Engineering, 2004, Work Plan, Madison-Kipp Corporation.

RSV Engineering, 2005, Annual Soil and Groundwater Report, Madison-Kipp Corporation.

RSV Engineering, 2006, Annual Soil and Groundwater Report, Madison-Kipp Corporation.

RSV Engineering, 2007, Annual Soil and Groundwater Report, Madison-Kipp Corporation.

RSV Engineering, 2007, Work Plan, Ozone Pilot Test, Madison-Kipp Corporation.

RSV Engineering, 2009, Soil Vapor and Groundwater Report, 2007-2008, Madison-Kipp Corporation, Madison, Wisconsin.

Schmoller, Michael, 2012, Deposition Transcript and Exhibits.

Trask, Jennine, 2012, Deposition Transcript and Exhibits.

URS Corporation, 2001, Groundwater Monitoring Results, Madison-Kipp Corporation, Madison, Wisconsin.

URS Corporation, 2002, August, Groundwater Quality Update, Soil Sample Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

URS Corporation, 2002, October, Groundwater Quality Update, Soil Sample Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

URS Corporation, 2003, Project Status Report, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

URS Corporation, 2003, July, Various Letters regarding soil sample results on Marquette Street.

WDNR, 2010-2012, Neighborhood Updates, summary maps and letters to neighbors.

U.S. EPA. 2003. The DNAPL Remediation Challenge: Is There a Case for Source Depletion? National Risk Management Research Laboratory. EPA/600/R-03/143.

U.S. EPA, 1995, User Guide to the VOCs in Soils Presumptive Remedy, EPA-540-F-93-048.

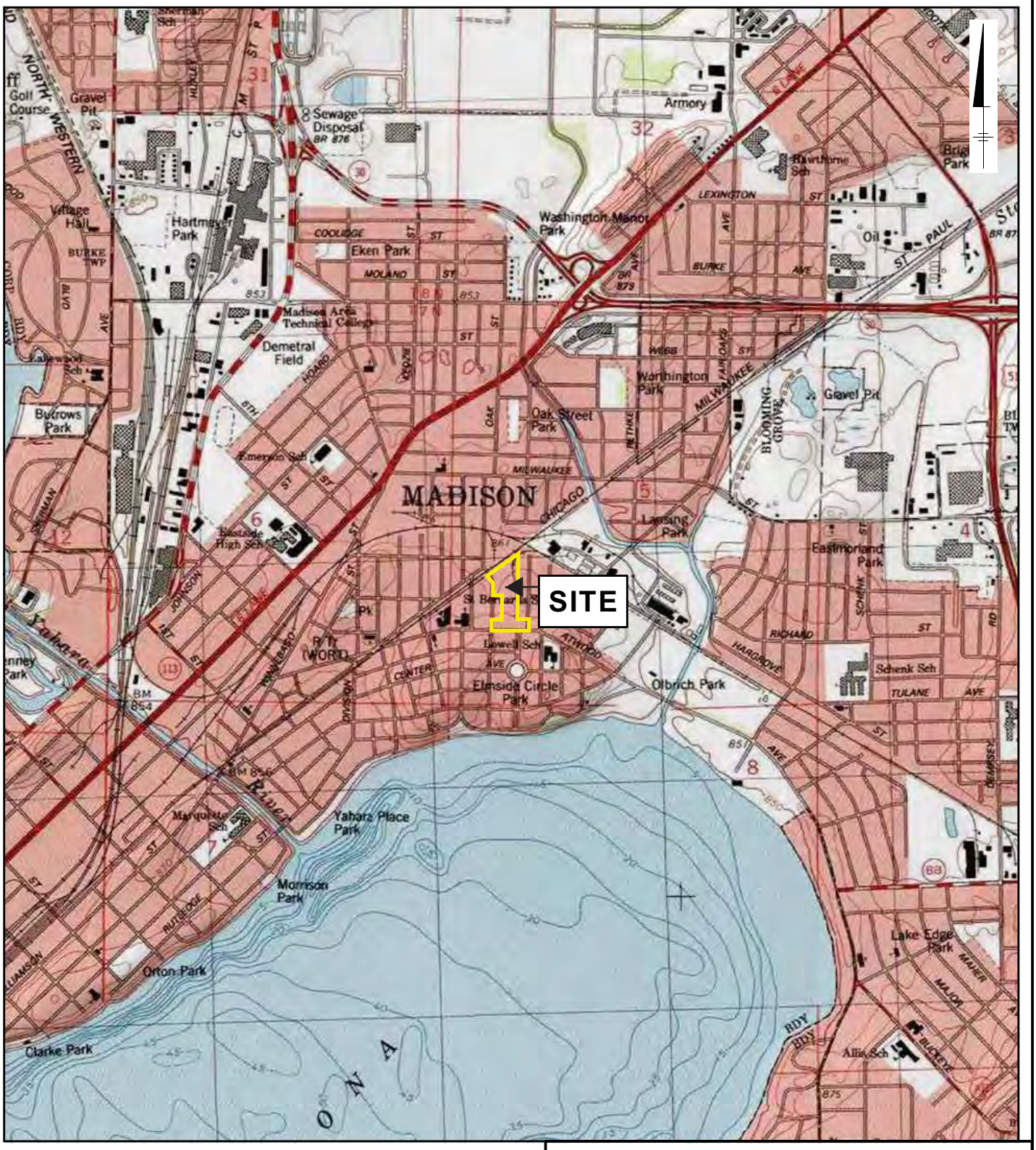
U.S. EPA, 1993, Options for Developing and Evaluating Mitigation Strategies for Indoor Air Impacts at CERCLA Sites, EPA -451/R-93-012.

U.S. EPA, 1992, Assessing Potential Indoor Air Impacts for Superfund Sites, EPA-451/R-92-002.

U.S. EPA, March 1991, Dense Non-aqueous Phase Liquids, Groundwater Issue, EPA/540/4-91-002.

U.S. EPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA.

Exhibits



NOTE:
TOPO BASE MAP OBTAINED FROM ESRI ONLINE MAPPING, USING ARCMAP 10 ACCESSED 5/21/2012

0 2,000 4,000 Feet

GRAPHIC SCALE

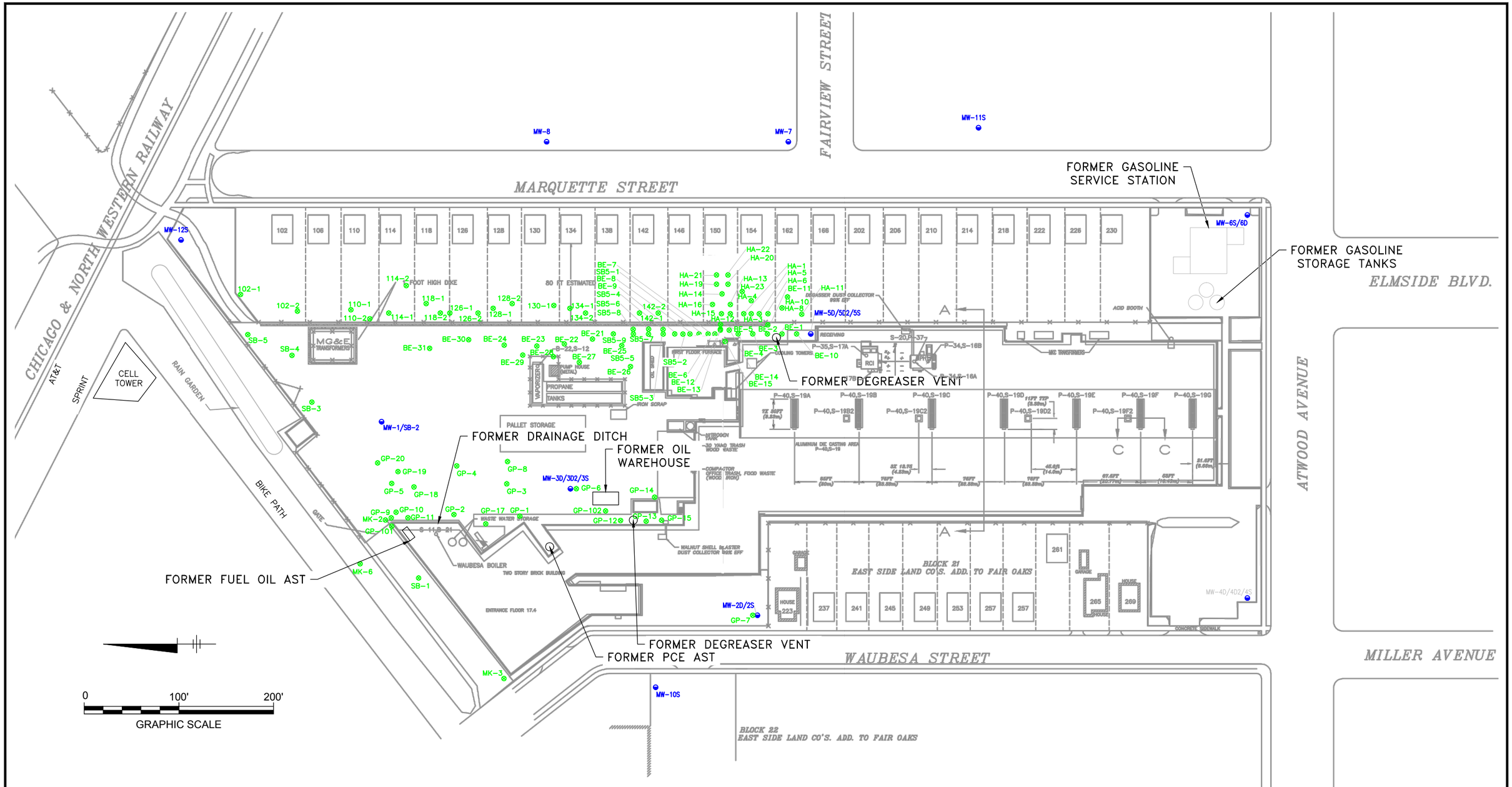
LE&A

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SITE LOCATION MAP

EXHIBIT

1



LEGEND:

MW-2D/2S● MONITORING WELL

GP-7⊗ SOIL BORING

SOURCE: MADISON KIPP CORPORATION

After Arcadis, 2012, Site Investigation Work Plan

MADISON KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SITE LAYOUT, SOIL BORING AND MONITORING WELL LOCATIONS

EXHIBIT
2

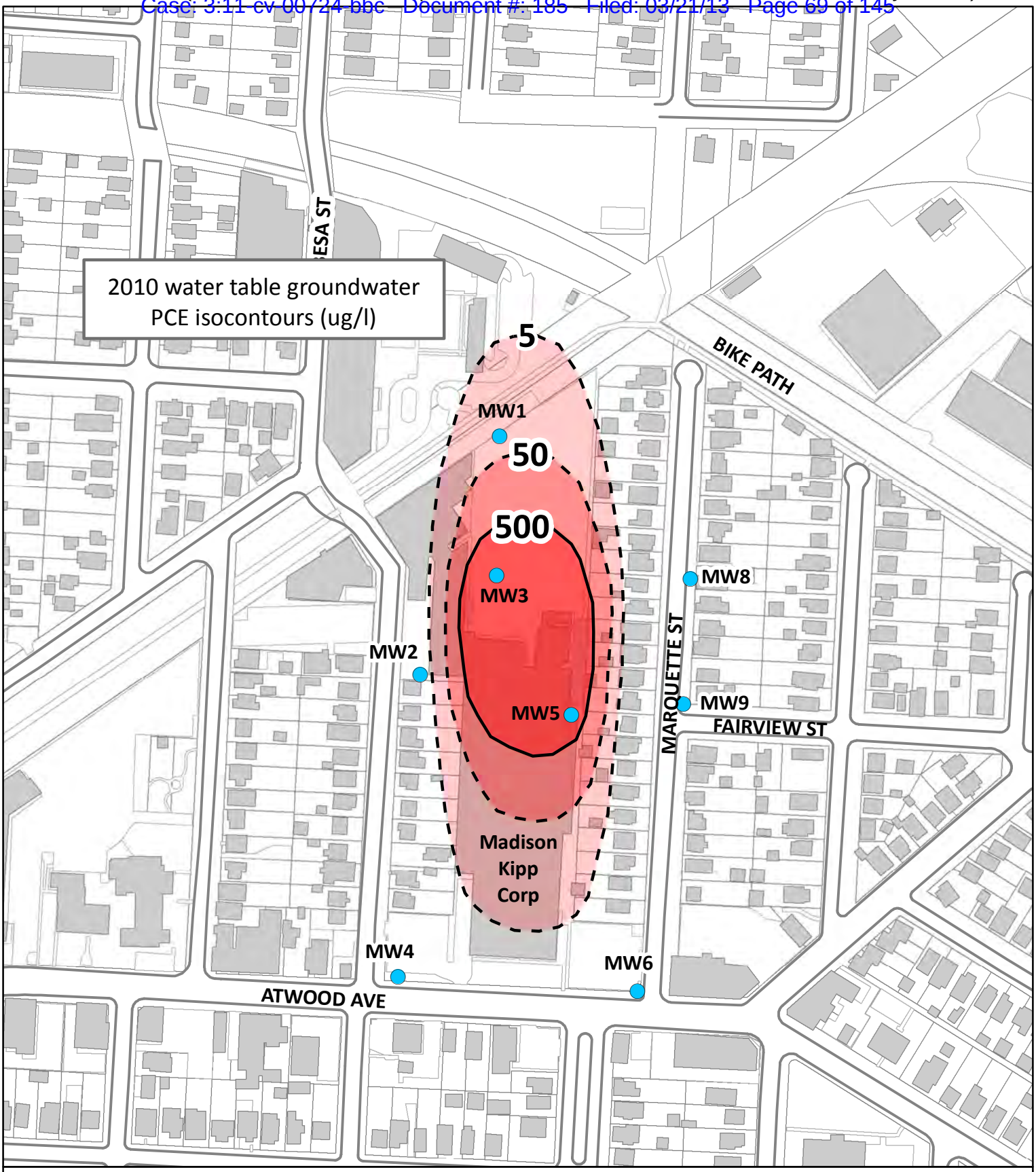


FIGURE 1
2010 Tetrachloroethylene (PCE) Isocontrous in Shallow Water Table Wells
Prepared by City of Madison Engineering (2/29/12)

Note: Data for MW7 and MW8 are from August 2011.
Dashed lines are approximate.

0 120 240 360 480 Feet
1 inch = 225 feet

N

Legend

- Shallow Wells (Water Table)
- PCE groundwater plume - 5 ug/l
- PCE groundwater plume - 50 ug/l
- PCE groundwater plume - 500 ug/l

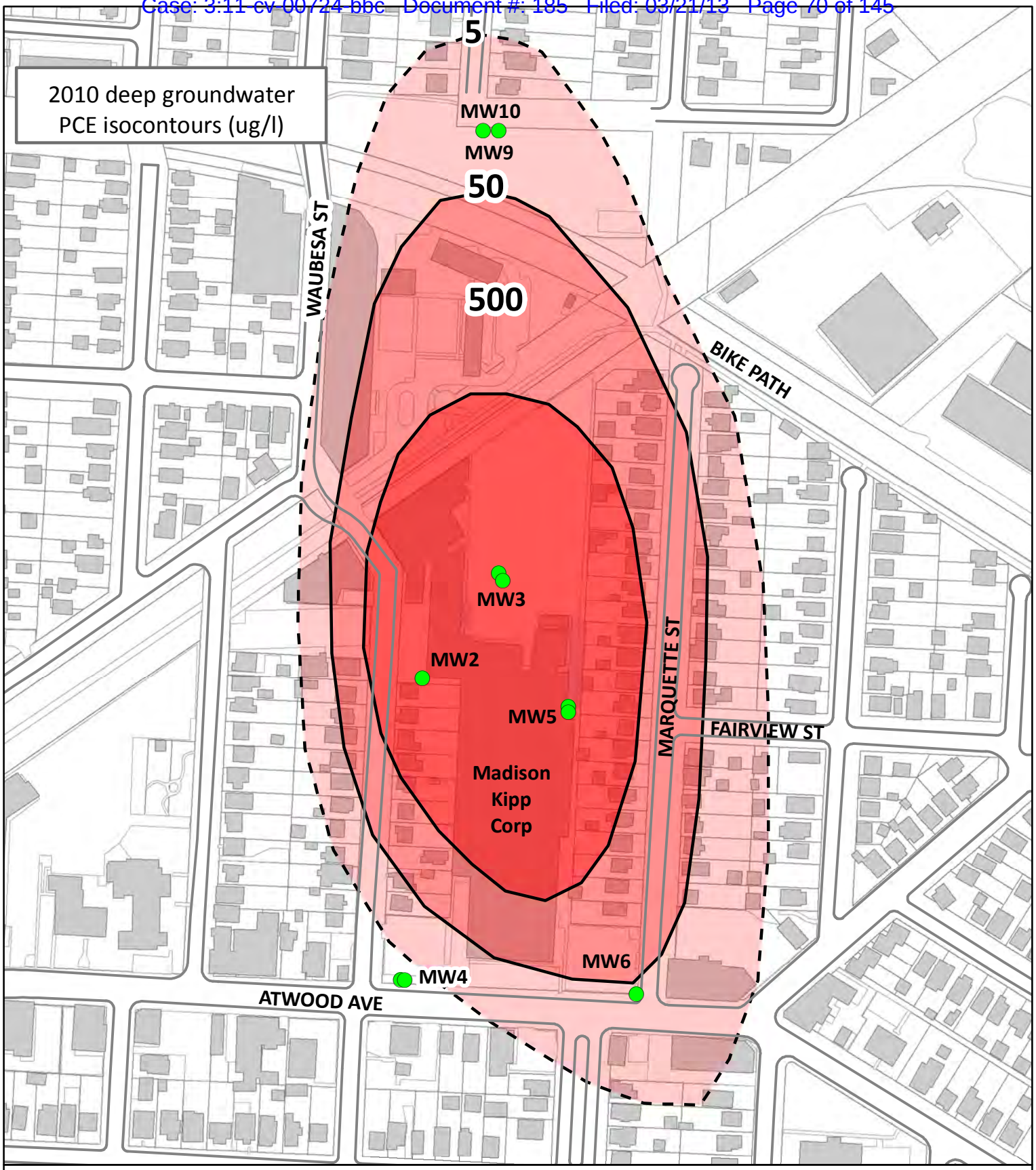


FIGURE 1
2010 Tetrachloroethylene (PCE) Isocontrous in Deep Groundwater Wells
Prepared by City of Madison Engineering (2/27/12)

Note: Piezometers have 5-foot screens placed between 790 and 810 ft AMSL.

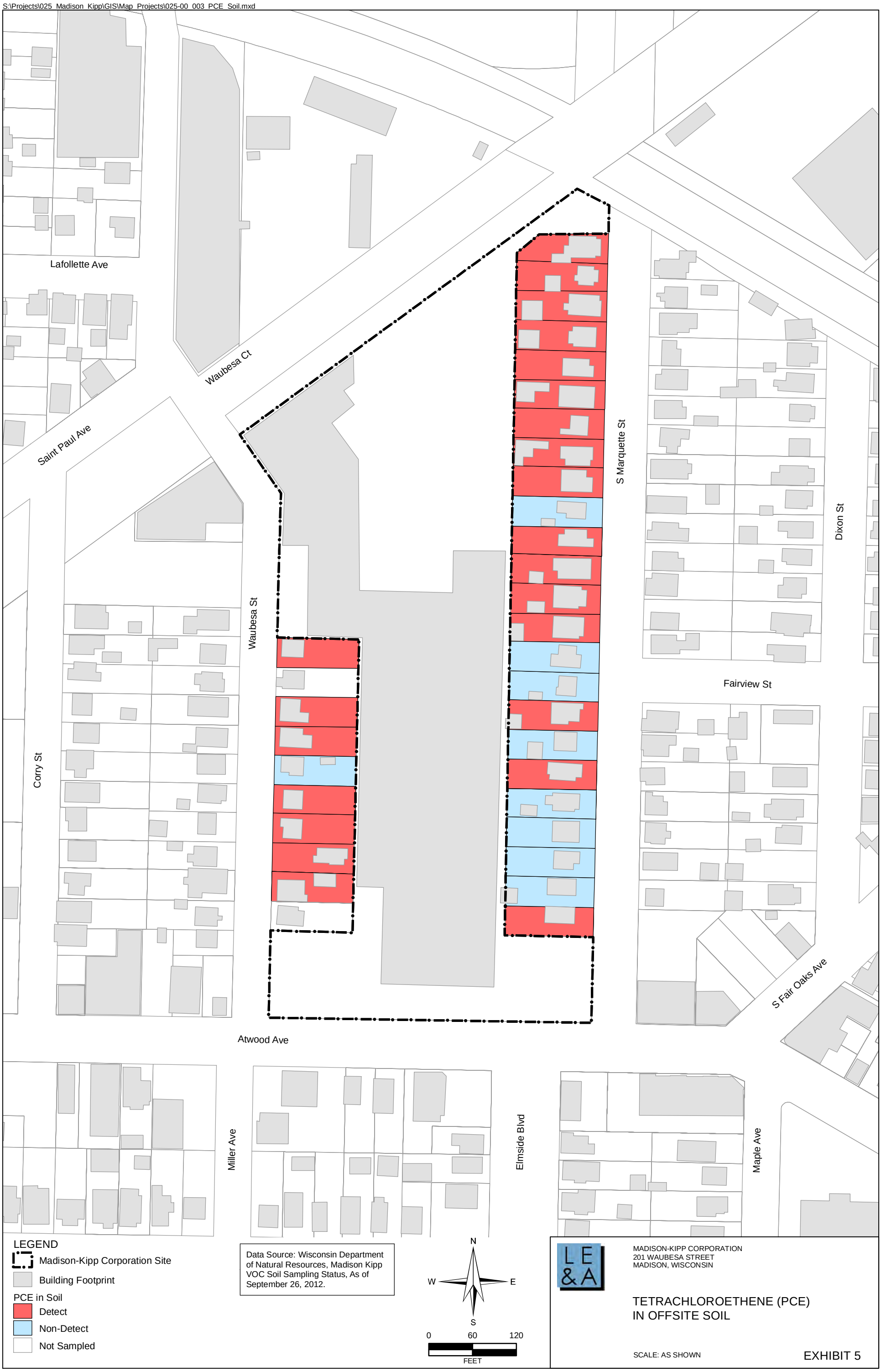
0 110 220 330 440 Feet
1 inch = 225 feet

N

Legend

- Deep Wells (piezometers)
- PCE groundwater plume - 5 ug/l
- PCE groundwater plume - 50 ug/l
- PCE groundwater plume - 500 ug/l

S:\Projects\025_Madison_Kipp\GIS\Map_Projects\025-00_003_PCE_Soil.mxd



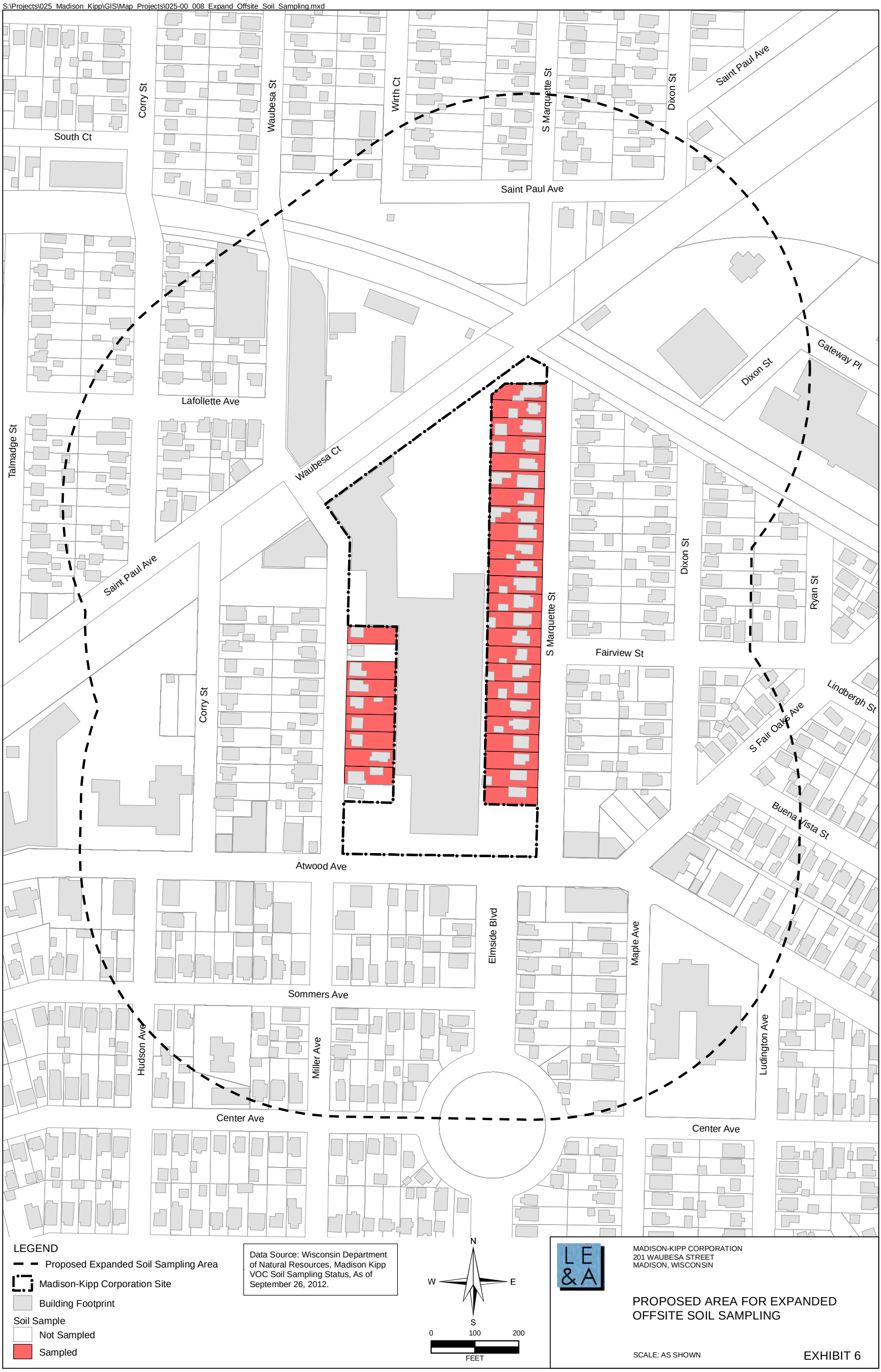
MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

TETRACHLOROETHENE (PCE) IN OFFSITE SOIL

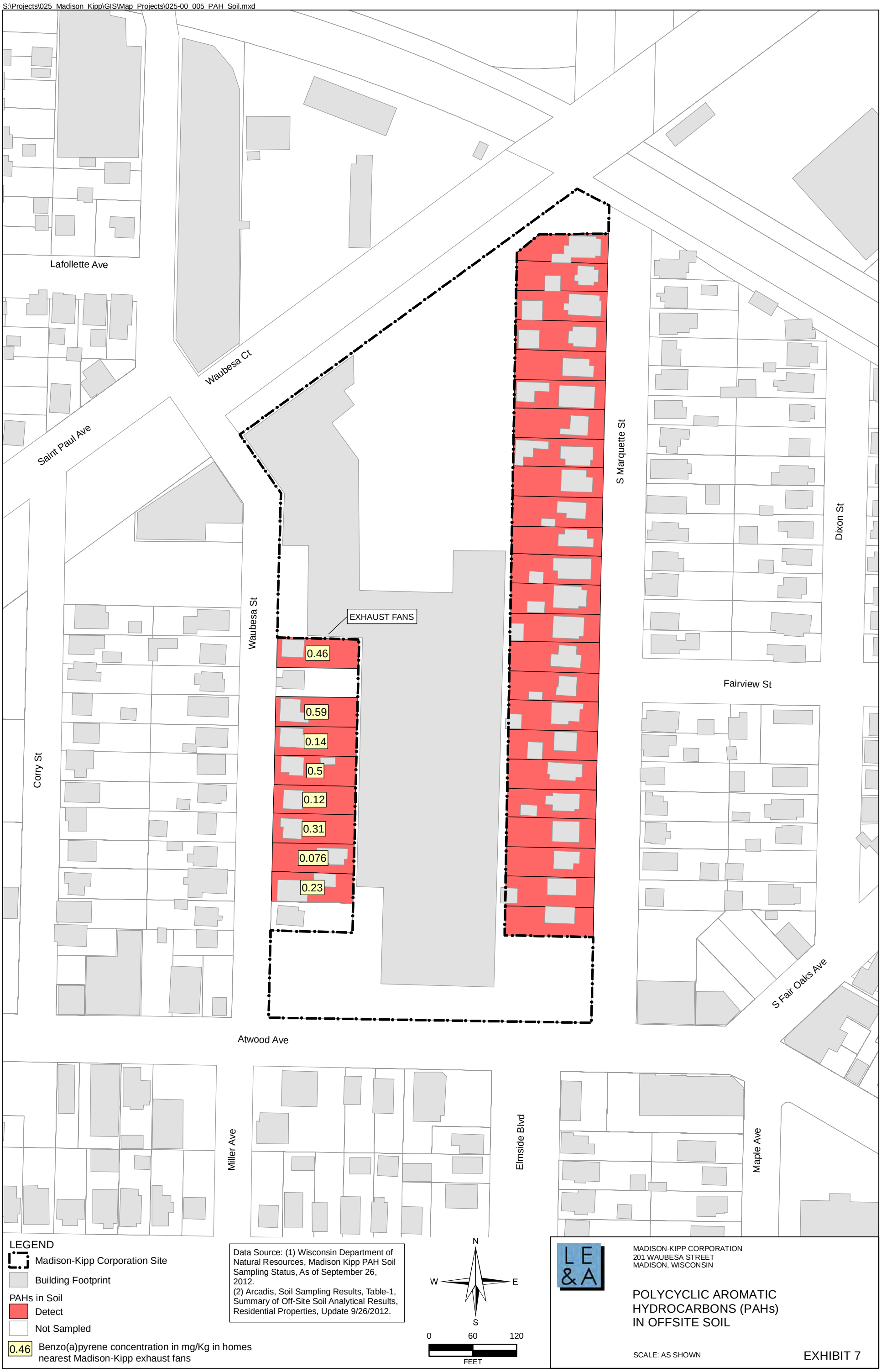
SCALE: AS SHOWN

EXHIBIT 5

S:\Projects\025_Madison_Kipp\GIS\Map_Projects\025-00_008_Expand_Offsite_Soil_Sampling.mxd



S:\Projects\025_Madison_Kipp\GIS\Map_Projects\025-00_005_PAH_Soil.mxd



S:\Projects\025_Madison_Kipp\GIS\Map_Projects\025-00_004_PCB_Soil.mxd

S:\Projects\025_Madison_Kipp\GIS\Map_Projects\025-00_006_PCE_Vapor.mxd

S:\Projects\025_Madison_Kipp\GIS\Map_Projects\025-00_007_Subslab_Mitigation_Systems.mxd

Table 1. Contaminants Detected in Residential Soil Near Madison-Kipp

Expert Report of Dr. Lorne Everett

Address	Class of Chemicals detected in soil*	Exceed non-industrial Direct Contact RCL or Action Level?	Chemicals
102 Marquette	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
106 Marquette	VOC, PAH, metals	Yes	TCE, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic, Lead
110 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
114 Marquette	VOC, PAH, metals	Yes	Benzo(a)pyrene, Dibenz(a,h)anthracene, Arsenic
118 Marquette	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
126 Marquette	VOC, PAH, metals	Yes	PCE**, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
128 Marquette	VOC, PAH, metals	Yes	Benzo(a)pyrene, Dibenz(a,h)anthracene, Arsenic
130 Marquette	VOC, PAH, metals	Yes	Benzo(a)pyrene, Arsenic
134 Marquette	VOC, PAH, metals	Yes	Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
138 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)pyrene, Dibenz(a,h)anthracene, Arsenic
142 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic

Address	Class of Chemicals detected in soil*	Exceed non-industrial Direct Contact RCL or Action Level?	Chemicals
146 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)pyrene, Arsenic
150 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
154 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
162 Marquette	VOC, PAH, metals	Yes	Benzo(a)pyrene, Arsenic
166 Marquette	VOC, PAH, metals	Yes	Benzo(a)pyrene, Dibenz(a,h)anthracene, Arsenic
202 Marquette	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
206 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
210 Marquette	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
214 Marquette	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
218 Marquette	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
222 Marquette	VOC, PAH, metals	Yes	Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
226 Marquette	VOC, PAH, PCB, metals	Yes	Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic

Address	Class of Chemicals detected in soil*	Exceed non-industrial Direct Contact RCL or Action Level?	Chemicals
230 Marquette	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
233 Waubesa	VOC, PAH, PCB, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
241 Waubesa	VOC, PAH, PCB, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
245 Waubesa	VOC, PAH, PCB, metals	Yes	PCE**, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
249 Waubesa	VOC, PAH, PCB, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
253 Waubesa	VOC, PAH, PCB, metals	Yes	Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic
257 Waubesa	VOC, PAH, metals	Yes	PCE**, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Arsenic
261 Waubesa	VOC, PAH, metals	Yes	Benzo(a)pyrene, Arsenic, Lead
265 Waubesa	VOC, PAH, metals	Yes	Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Arsenic

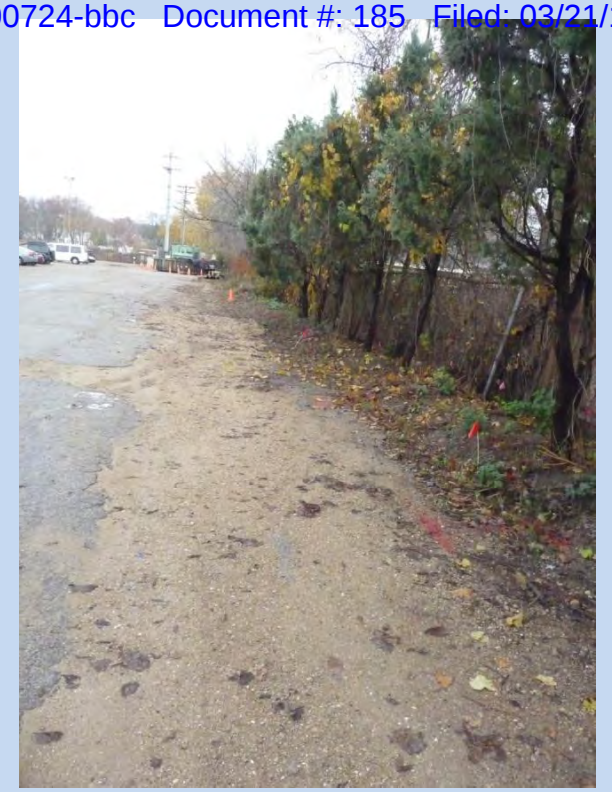
**Metals are listed if one or more metals exceed Wisconsin non-industrial direct contact RCL; VOC detections are generally in soil vapor*

**PCE exceedence was in subslab sample (WDNR, Residential Sampling Update, June 29, 2012)

Photographs

Showing the location of the above ground PCE storage tank. Note, no indication of soil samples taken. Note that the surface flow is towards the front of the picture.

Showing the drainage from the above ground storage tank area flows to a subsurface drain heading towards the northern part of Madison-Kipp property.



Looking towards the northeastern side of the Madison-Kipp parking lot showing how the drainage is to the east into the neighboring family properties.

Looking south and noting how the drainage is to the east into the neighboring properties.

Shows the location of MW- 5, the highest contaminated groundwater well, relative to the neighboring buildings directly adjacent to the fence line.

L. EVERETT & ASSOCIATES

Picture 5

Shows Madison-Kipp's lawyer's foot adjacent to the most contaminated well MW- 5. Note the door in the background which was used by Madison-Kipp employees to dump buckets onto the bare ground (see Lenz deposition)

L. EVERETT & ASSOCIATES

Picture 6

Shows MW 5, the most contaminated of the groundwater wells. Note how the surface flow moves down gradient towards the north.

L. EVERETT & ASSOCIATES

Picture 7

Shows how flow from the MW- 5 area flows down gradient into the neighboring properties.

L. EVERETT & ASSOCIATES

Picture 8

Taken from the Madison-Kipp side of the fence showing how overland water flow can easily migrate off site into the neighboring properties.

Shows how the backdoor of some homes open up immediately adjacent to the parking lot and to the Madison-Kipp fence.

Shows that the backdoor of properties would be very close to touching the fence when they were opened.

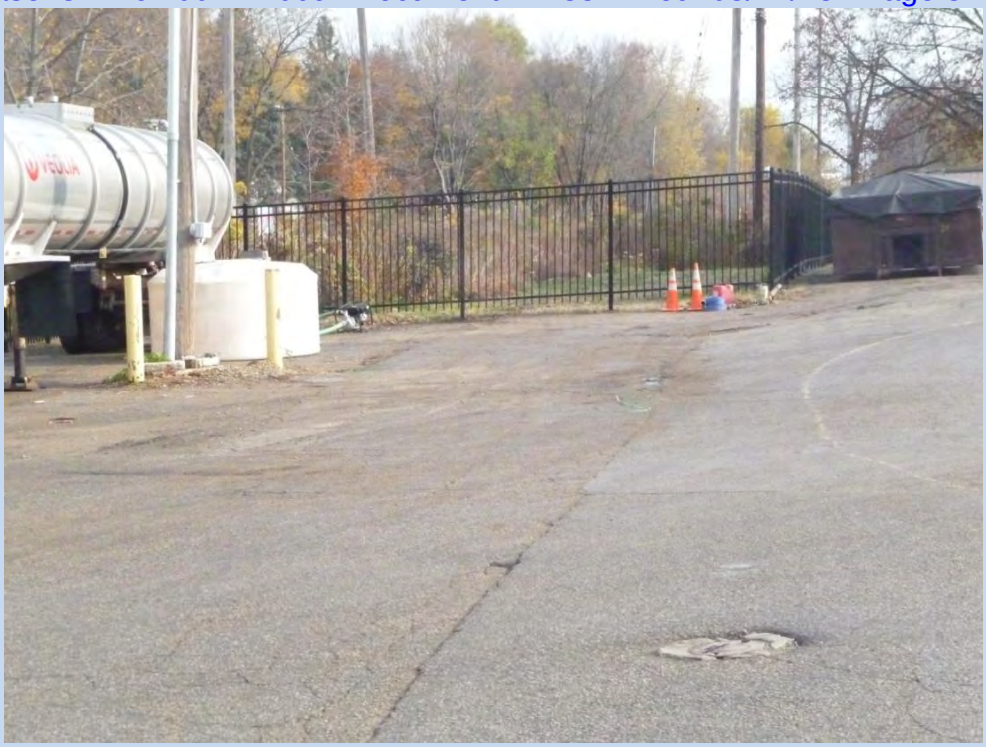
L. EVERETT & ASSOCIATES

Picture 11

Shows a drainage grate down gradient from the above ground storage area. The subsurface sewer then turns towards the north east towards the bicycle path noted in the top of the picture

L. EVERETT & ASSOCIATES

Picture 12



Shows the garden area which has been noted as the discharge point for the subsurface sewer.

Shows the bicycle path on the northern boundary of the Madison-Kipp property and the green belt which would receive the sewer discharge to the northeast.

Shows the proximity of neighboring windows immediately adjacent to the Madison-Kipp facility. Notice that the gate does not have a hazardous waste warning sign.

Shows the huge roof stacks associated with the Madison-Kipp facility directly adjacent to the backyards of homes.

Shows three huge Madison-Kipp smoke stacks directly adjacent to homes. The home on the left appears to be one of the closest homes to the smoke stacks and appears to be abandoned.

L. EVERETT & ASSOCIATES

Picture 17

Shows the Madison-Kipp property on the right hand side and the neighboring property demonstrating how close the homes are to the Madison-Kipp facility.

L. EVERETT & ASSOCIATES

Picture 18

Looking north from the southwestern parking lot. Note narrow passage way between Madison-Kipp property and home at approximately 269 Waubesa Street.

L. EVERETT & ASSOCIATES

Picture 19

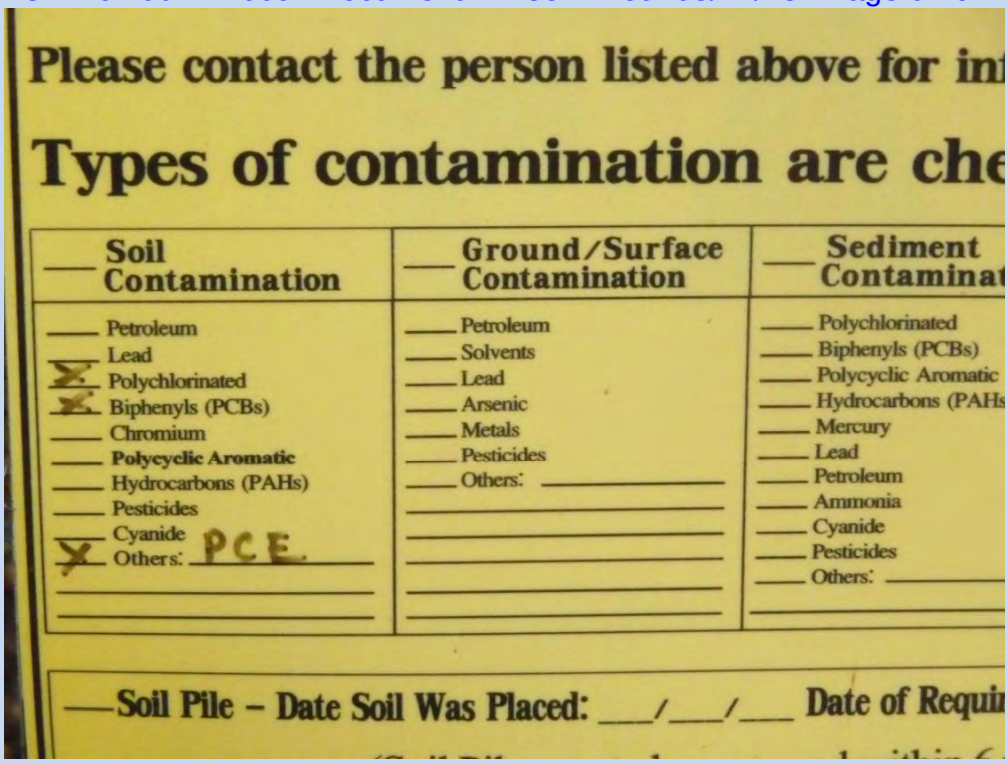
Standing along the narrow alley way on the west side of Madison-Kipp looking directly into the windows of immediately adjacent homes.

L. EVERETT & ASSOCIATES

Picture 20

Looking due west at the edge of the Madison-Kipp facility. Note that the property to the left would be 233 Waubesa Street. Note the three vents projecting through the windows and the one vertical vent.

Close-up of the window vents showing the buildup of various petroleum tars caked around the vents.



Close-up of the hazardous waste notification sign identifying PCBs and PCE as soil contamination.

L. EVERETT & ASSOCIATES

Picture 23

Hazardous waste chemical warning sign placed on the Madison-Kipp property directly adjacent to the homes on Marquette Street.

L. EVERETT & ASSOCIATES

Picture 24

Showing the southwest parking lot part of which is covered by the lower buildings at the back of the picture.

Showing the home at 233 Waubesa Street. Note the vapor depressurization system on the left hand side of the home. Also note the immediate proximity of the Madison Kipp vents located on the Madison-Kipp property.

Back yard of one of the homes on Marquette Street showing the proximity of children's play tables, children's play swings, children's play tetherballs, children's trampoline and two boats indicative of outdoorsy athletic families.

Showing two separate depressurization systems on the north side of this home on Marquette Street. Note the location of the 2 vapor depressurization systems relative to the 2 rain gutter downspouts.

Showing the vapor depressurization system location directly adjacent to the wall. Notice the poor condition of the wall and concrete floor.

L. EVERETT & ASSOCIATES

Picture 29

Showing a second location for the depressurization system in a clients home.

L. EVERETT & ASSOCIATES

Picture 30

Showing how the two vapor extraction locations are plumbed together to the outside.

Showing the vapor depressurization system location directly adjacent to the wall. Notice the poor condition of the wall and the concrete floor.

Showing a vapor extraction system. Note the condition of the concrete wall in the background and the condition of the floor.

L. EVERETT & ASSOCIATES

Picture 33

Showing the cracks in the concrete wall and the seepage of moisture through the cracks.

L. EVERETT & ASSOCIATES

Picture 34

Shows the presence of floor drains in the basements which would act as conduits for vapor to enter the buildings.

Showing the condition of the concrete in the basement. The cracks in the wall would allow contaminated vapors to enter the basement.

Attachment A

Resume for Dr. Everett

L. EVERETT & ASSOCIATES
ENVIRONMENTAL CONSULTANTS

LORNE G. EVERETT, Ph.D., D.SC., F.ASCE

President/CEO

Over 40 years experience in site characterization and remediation of soils and groundwater

L. Everett & Associates, LLC
3700 State Street, Suite 350
Santa Barbara, CA 93105
Phone: (805) 880-9300
e-mail:
leverett@everettassociates.net

Education

Ph.D., Univ. of Arizona, Hydrology, 1972
M.S. Univ. of Arizona, Limnology 1969
B.Sc., (Honors) Lakehead University, 1968
B.Sc., Lakehead University, 1966
Doctor of Science (Honoris Causa), Canada, 1996
Chancellor, Lakehead University, Ontario, Canada, 2000-2009

Professional Registrations

Certified Groundwater Professional-AGWSE (Reg. #293)
American Society of Civil Engineers – M.ASCE 36724
Director, Vadose Zone Monitoring Laboratory, University of CA at Santa Barbara
Full Research Professor, University of California
GET, Rocky Flats, DOE
Member, Russian Academy of Sciences-No. 300-H3
NIOSH/OSHA/USGS/EPA Hazardous Waste Certified
Nuclear Regulatory Commission-Isotope Experimental Work, AR12, AEC, 10-24
RAD, Rocky Flats, DOE
Registered Laboratory Chemist
Registered Nuclear Soil Moisture and Density Gauges
Registered Professional Groundwater Hydrologist-AIH (Reg. #836)
Registered Professional Hydrologist-AIH (Reg #164)
ASTM-Fellow
AWRA-Fellow

Dr. Lorne G. Everett is the President and CEO of L. Everett & Associates. He is also a retired Professional Researcher in the Bren School of Environmental Science & Management at the University of California at Santa Barbara (UCSB) (Level VII) and a Past Director of the Vadose Zone Monitoring Laboratory at UCSB. The University of California describes full professor Level VII as "reserved for scholars of great distinction". He has a Ph.D. in Hydrology from the University of Arizona in Tucson and is a member of the Russian Academy of Natural Sciences. In 1996, he received a Doctor of Science Degree (Honoris Causa) from Lakehead University in Canada for Distinguished Achievement in Hydrology. Dr. Everett was the 6th Chancellor of Lakehead University in Canada from 2000-2009.

He is an internationally recognized expert who has conducted extensive research on subsurface characterization and remediation. He is Chairman of the ASTM Task Committee on Groundwater and Vadose Zone Monitoring (D18.21.02). He also chaired the Remediation Session of the First USSR/USA Conference on Environmental Hydrogeology (Leningrad, 1990). Dr. Everett has received numerous awards, published over 150 technical papers, holds several patents, developed 11 national ASTM Vadose Zone Monitoring standards and authored several books including: *Vadose Zone Monitoring for Hazardous Waste Sites, and Subsurface Migration of Hazardous Waste.* His book entitled *Handbook of Vadose Zone Characterization and Monitoring* is a "best seller". His book entitled *Groundwater Monitoring* was endorsed by the Environmental Protection Agency (EPA) as establishing "the state-of-the-art used by industry today" and is recommended by the World Health Organization for all developing countries.

Awards Dr. Everett has received include: the Ivan A. Johnston Award for Outstanding Contributions to hydrogeology (1997), the Kapitsa Gold Medal-the highest award given by the Russian Academy for original contributions to science (1999), the Medal of Excellence from the U.S. Navy and the Award of Merit-the highest award given by the American Society for Testing and Materials (ASTM) International (2000), the C. V. Theis Award-the highest award given by the American Institute of Hydrology for major contributions to groundwater hydrology (2002) and the Canadian Golden Jubilee Medal for "Significant Contributions to Canada" (2003).

Dr. Everett is editor of the Ann Arbor Press book series entitled *Professional Groundwater and Hazardous Waste Science Series*. He is co-editor of the Journal for Environmental Restoration Professionals entitled *Remediation Management* and co-editor of the *World Groundwater Map* published by United Nations Educational, Scientific and Cultural Organization (UNESCO).

Dr. Everett has made presentations before Congress on different occasions and participates on Blue Ribbon Peer Review panels for most Department of Energy (DOE) installations. He is a member of the UC/LLNL Petroleum Hydrocarbon Panel, the DOE/EPA Volatile Organic Compound (VOC) Expert Committee, the Interagency Dense Non-aqueous Phase Liquid (DNAPL) Consortium Science Advisory Board and a Scientific Advisor to the U.S. Navy's National Hydrocarbon Test Site Program. Dr Everett is a member of the DOE Executive Panel for both the Vadose Zone S & T Roadmap and the Long-Term Stewardship Roadmap.

Dr. Everett is an expert witness with an established track record in over 60 court cases involving over $2 billion dollars.

Professional Registrations, cont.

California Registered Environmental Assessor, Class 1-05268
California Registered Environmental Assessor II (Reg. #20240)
International Association of Hydrogeologists #89524

Professional Societies

American Academy of Environmental Engineers
American Institute of Professional Hydrologists
American Medical Laboratory Association
American Society of Civil Engineers
American Society for Testing and Materials
American Water Resources Association
Association of Ground Water Scientists and Engineers
International Water Resources Association
National Association of Underwater Instructors
National Ground Water Association
Russian Academy of Sciences
Science and Engineering Council (President and Chairman of the Board, 1983-1984)
UNESCO-IHP, France

Security Clearances

Secret DOD Clearance – Expired
Security Clearance Contractor – US Navy - Expired
Security Clearance Contractor – US DOE – Expired
FBI Secret Clearance – Renewal Approved

"Blue Ribbon" DOE Peer-Review Panels

Dr. Everett is under contract as a remediation "peer reviewer" at the following Department of Energy Sites:

Oak Ridge National Lab

Interagency DNAPL Consortium

DOE Vadose Zone Steering Committee

DOE CMST CP Annual Peer Reviewer

DOE International Conference Advisor, 1999

OCUZ Review Working Group, INEEL, September 1997

Yucca Mountain, Nevada

Brookhaven National Lab, NY

Lawrence Livermore National Lab, CA

Hanford, Washington

Savannah River, Georgia

Rocky Flats, Colorado

Idaho National Engineering Lab, Idaho

Fernald, Ohio

Barrier Program, Washington D.C.

ASTM D18.21.02

National Meetings Chaired by Dr. Everett

1992 Jan. 26-31 New Orleans June 14-19 Louisville

1993 Jan. 17-22 San Antonio June 20-25 Atlanta

1994 Jan. 23-28 San Francisco June 19-24 Montreal

1995 Jan. 22-27 Phoenix June 18-23 Denver

1996 Jan. 28-31 Atlanta June 16-19 Orlando

2005 Jan 23-26 Atlanta June 12-15 Reno

2006 Feb 5-9 Phoenix June 11-15 Toronto

2007 Jan. 28-31 Anaheim June 24-17 Norfolk

2008 Jan 29 Tampa

In addition to the two ASTM standards awards mentioned earlier, Dr. Everett has been responsible for developing a number of new ASTM standards. Each one of these standards has to be approved unanimously by the 34,000 membership of ASTM. Each standard that has negative votes associated with it has to be technically argued by Dr. Everett to the satisfaction of the various ASTM committees. Some of his national

standards have taken as much as six years to complete. Dr. Everett's standards include:

ASTM Vadose Zone Monitoring Standards

Test Method for Vadose Zone Borehole Flow Rate Capacity Test (Draft)

Contaminant Barrier Monitoring Standard (in development)

Environmental Decision Standard for Coastal Petroleum Facilities (in development)

Vadose Zone Terminology (Final)

Standard Guide for Soil Gas Monitoring in the Vadose Zone (D5314-92)

Practice For Passive Soil Gas Sampling in the Vadose Zone for Source Identification, Spatial Variability Assessment, Monitoring, and Vapor Intrusion Evaluations (D7758)

Practice for Active Soil Gas Sampling for Direct Push or Manual-Driven Hand-Sampling Equipment (WK23766)

Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluations (D7663)

Soil Pore-Liquid Monitoring (D 4696-92)

Soil Core Monitoring (D 4700-91)

Matric Potential Determination (D 3404-91)

Neutron Moderation (D 5220-92)

Flux Determination (Final)

Soil Gas Monitoring (D 5314-93)

Air Permeability Determination (Outline)

Hydraulic Conductivity (D 5126-90)

Field Screening (Final)

Soil Moisture Determination (Outline)

Thermalcouple Psychrometers (Outline)

Water Content Determination (Final)

Time Domain Reflectometry (Z6363z)

Frequency Domain Capacitance (Z4302z)

Horizontal Applications Of Neutron Moderation (Final)

Determining Unsaturated Hydraulic Conductivity In Porous Media By Open-Flow

Centrifugation (Z5651z)

Determination of Water (Moisture) Content of Soil & Rock (WK 14112)

Standard Guide for Active Soil Gas Sampling for Direct Push or Manual Driven Sampling Equipment (D 7648-12)

Standard Guide for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluation (D 7663-12)

Standard Practice for Passive Soil Gas Sampling in the Vadose Zone for Source Identification, Spatial Variability, Monitoring, and Vapor Intrusion Evaluation (D 7758-11)

Standard Guide for Selection of Chemical Field Screening and Field Analytical Methods used in Vadose Zone Investigations (WK36302)

Standard Practice for Using Disposable Field Extraction Samplers for Sample Extraction and Storing Soil for Volatile Organic Analysis (WK37133)

Dr. Everett has participated as an expert witness in over 100 million dollars in litigation. His participation in depositions, trial and litigation support are listed below. Because of Dr. Everett's extensive experience in measuring subsurface parameters based upon the work conducted in his Vadose Zone Monitoring Lab, he is highly sought after by trial attorneys to support hazardous waste litigation cases.

Professional Activities

Expert Witness

Depositions, Trial Appearances & Litigation Support:

1983 University of Texas vs Texaco Incorporated

1988 Foothill Triangle Partners vs Mobile Oil Corporation

1990 St. Vincent De Paul vs California Linen

1992 State of California vs Hyatt Corporation

1993 U.S.A & State of California on behalf of TSC vs Allied-Signal, Incorporated, California Car Hikers Services, Hawker Pacific, Incorporated.

1993-94 Cigna Insurance Co. vs Talley Corporation

1994-96 Harz vs Zell

1994-95 Western Bank vs Great Lakes Chemical Company

1994-95 Gallaread vs AMP Incorporated, et al

1994-97 Volvo - GM Heavy Truck Corporation vs HM Holdings, et al

1994-95 State of Arizona vs Mission Industries

1995-97 Kennington Ltd., Inc. vs ITT Corporation

1995-2003 Refinery Holding Company, L.P. vs El Paso Refinery, et al

1995-1998 Lambda vs Mission Industries

1996 Jordan - Botke Enterprises dba PW Environmental vs Santa Barbara MTD

1996-1997 Siemens Components, Inc. vs Applied Technology, Litton Systems, et al.

1996-1999 Honeywell Inc. vs. General Electric Company

1996-1998 Kern High School vs. KC Environmental Health Services Department

1996-1998 Leonard vs. Texaco, G&M Oil, Mohawk Petroleum, Getty Oil, Shell Pipeline, TRMI, ARCO, Four Corners Pipeline, Shell Oil Co.

1997-1999 D.W. Smith, et al. vs. Exxon Co., USA.

1997-1999 Griggs Construction vs. Furbreeders, Inc.

1997-1998 Kimberly, et al. vs. Bob Burglin, et al.

1997-1998 Rachel Pray vs. Redwood Oil Co.

1997-1999 BGPAA vs. Lockheed Inc.

1998-2000 Anthony vs. Chevron et al.

1999-2000 County of Ventura vs. Eagle Star Ins. Co.

1999-2000 Aguayo, et al. v. Betz Dearborn, Inc., et al.

1999-2000 GBF/Pittsburg Landfills Respondents Group v. Contra Costa Waste Services

2000-2003 Capitol Pacific Holdings, Inc. v. Orange County Fire Authority

2000-2003 Hugh's Family v. F.A.G. Bearing Co, et al

2000 Redlands Tort Litigation Case No. RCV 3149 (Contract signed but Co conflict resulted in withdrawl)

2000-2003 Miami International Airport (Dade County), Florida vs. United States Department of Justice

2001-2002 Dole Foods vs. Oahu Water Supply Board

2001-2002 Dole Foods vs. Akee et al.

2001-present REV 973, LLC, a California limited liability co. vs. John Mouren-Laurens

2001-2001 City and County of Honolulu vs. Clinton Churchill, et al.

2001-2001 Shockley, et al. vs. Sabreliner et al.

2001-2004 Associated Aviation Underwriters vs. Miami-Dade County

2002-2002 Ogner Motor Cars Inc. vs. Valley Park Ford, Inc.

2002-2003 Sebouh Isagholian dba Prime Auto Parts & Salvage, Inc. vs. Quikrete

2002-2002 W. Huhn, Tank Lines Inc. vs Dico Oil et al

2002-2003 Neodesha, KS vs Amoco Oil et al

2002-2003 Sugar Creek, MO vs Amoco Oil et al

2003-2004 Zanoli vs. City of San Luis Obispo

2003-2004 Kram vs. Wierda

2003-2004 National Bank vs. Industrial Zinc

2003-2009 Angeles Chemical Co etc. vs. McKesson (Chemical) Corporation etc.

2003-2003 Lopez Family vs. Stanislaus County

2003-2004 Espinola, et al. vs. Oakley-Avalon, et al.

2004-2009 C. M. Clark et al vs City of Santa Rosa et al

2004-2004 UST Case #040259, PG&E Chico vs CRWQCB

2004-2008 Lodi Chrome vs. City of Lodi

2004-2006 Porta Bella LLC vs. City of Santa Clarita

2005-2005 Smith vs Dresser

2004-present Joan Schwan et al. vs. CNH et al.

2005-2006 Parco Land, Inc. and Accuride International, Inc., vs. Parco, Inc and DOES 1-10

2005-present Shannon Franco, et al. v. Coronet Industries, Inc., et al.

2005-2006 City of Pomona vs. John Michael Faull et al. T/D

2006-COI Patricia Baumbach et. al. vs. ExxonMobil Corp. et. al.

2006-2007 Martha C. Miller, et al. vs. Mandrin Homes, Ltd.

2007-Present Gerard DePascale, Liam Neville, and Joanne DePascale vs. Sylvania Electric Products Inc. et al. D

2007-2008 Splendid Cleaners, Inc. vs. Victor Goldenberg; et al. T/D

2007-2008 Tyanna and Jeff Cannata et al. vs. Forest Preserve of DuPage County et al. D

2007-Present Pacific Gas & Electric Company vs. Lange, et al.

2007-2008 Hinds Investments, L. P., et al. vs. United Fabricare Supply, Inc., et al.

2008-Present Cindy Avila, et al., vs. CNH America, LLC, et al.

2007-2008 Debra Bebernes et al vs. Renee Condit et al. D

2009-2009 Perez vs. Forest Preserve District of Du Page County et al

2009-present Picerne Military Housing, Inc. et al vs. American International Specialty Lines Insurance Company D

2009-2009 Houshang Rahban et al vs. Detrex Corporation

2009-present Susan and Patrick Stoll, Mary and Charles Bowles vs. Kraft Foods Global, Inc. D

2010 –present Remson et al vs. Verizon, et al D

2010-present KB Gardena Building, LLC vs. Whittaker Corporation, Brasscraft Manufacturing Co., Bog "B" Transportation, Alphonse Vanbastelaar

2010-present Hawker Pacific, Inc. vs. United States Environmental Protection Area 1 Superfund Site North Hollywood Operable Unit

2010-present Hinds Investments, L.P. and Thomas Hinds vs. Thu X. Hunyh and Ban T. Hunyh et al

Patents Held

U.S. Patent No. 5,272,910

UC Case No. 92-105

Wick Layer Enhanced Monitoring for Landfill Barriers

U.S. Patent No. (Pending Patent)

UC Case No. 90-077-1

Air Permeability Measurement Under Variable Capillary Pressures

U.S. Patent No. 4,754,136

Method of Detecting Underground Tank Leak

U.S. Patent No. 5,543,623

Method for Detecting and Mitigating Underground Organic Contamination

U.S. Patent No. 4,765,885

Method to Remove Bitumen from Tar Sands

U.S. Patent No. 4,891,131

Method to Use Sonication to Upgrade Crude Oil

U.S. Patent No. 5,017,281

Method to Separate Organic Matter from Solids

U.S. Patent No. (Pending Patent)

Serial No. 08/032,600

Soil Remediation

U.S. Patent No. (Pending Patent)

Serial No. 08/035,529

Surfactant Soil Remediation

Fields of Specialization

Vadose zone monitoring, instrumentation and remediation.

Soil moisture, LNAPL and DNAPL migration.

Regulatory guidance, training, expert witness and materials standards.

Methane Experience

For over 15 years Dr. Everett has been the Charter Chairman of The American Society for Testing and materials (ASTM) International's committee D18.21.02 dealing with vadose/soil zone monitoring. In this capacity, Dr. Everett has developed the only ASTM national soil gas/methane sampling standard in America. This standard is directly applicable to evaluating methane migration either from the water table or from vadose zone vegetation and contaminated soils. For 15 years, Dr. Everett was the Director of the Vadose/Soil Zone Monitoring Laboratory at the University of California where he focused on gas transport in the vadose zone. In particular, Dr. Everett was concerned with the migration of methane relative to its explosion liabilities. Dr. Everett has conducted numerous investigations associated with the presence of methane in response to contaminated groundwater

and contamination sources in the vadose zone. Methane is often referred to as a swamp gas which indicates that can be naturally generated in response to dead and decaying organic matter. Dr. Everett has been involved in characterizing sites for methane in terms of drilling technologies, pore liquid water sampling technologies, soil gas investigations, and has worked extensively on various remediation strategies for methane contamination sources. Dr, Everett has evaluated methane in terms of various kinds of fire and contamination insurance liability. He has studied the generation of methane from various source materials and is aware of the various forensic techniques to identify specific methane sources. Dr. Everett has conducted methane investigations relative to the anaerobic conditions and the oxidation reduction potential required to generate methane in addition to understanding the behavior of methanotropic bacteria which have a dramatic effect on the distribution of methane in the sub surface.

Pulp and Paper Mill Experience

Dr. Everett has had several years of first hand experience working in most areas associated with both a pulp and newsprint paper mill and high bleach finished paper plant. He is familiar with the waste stream associated with all aspects of the front and back end of paper making. In particular he has worked in the wood yard, grinding room, beater machines, binding machines, wet pulp end, dry end, finishing room, shipping room, and laboratory. Dr. Everett is familiar with the waste stream sampling protocols for both air and water. He has conducted wet chemistry tests on the majority of the effluence coming from pulp and paper mills. Further, he has conducted down gradient water surveys including both sampling protocols and analytical protocols for environmental impacts of pulp and paper mill operations.

PCB Experience

Dr. Everett has had extensive experience in the characterization and the selection of remediation technologies for PCB impacted sites. In trial he has been deposed in excess of 28 days on PCB sampling technologies. Further, he has extensively evaluated the characterization approaches and the pitfalls associated with PCB characterization. He has worked on the various groundwater filters used as a part of a PCB water sampling program. He has worked on developing water pumping rates and pump selection to be compatible with PCB sampling. PCB's are the proverbial "tar baby" and as such do not lend themselves to common decontamination procedures. Dr. Everett is familiar with the solubility and mobility issues associated with PCB's particularly in relation to PCB adsorption to colloids and the artificial agitation of colloids brought on by excessive pumping rates which results in artificially elevated PCB analytical results.

Short Courses and Professional Workshops

Participant in special training, the Los Angeles Soil Gas Forum held on March 4, 2008 at the Los Angeles Regional Water Quality Control Board, Carmel Room. The forum was lead by the DTSC and the Regional Board and focused on soil gas vapor intrusion issues.

The Devil is in the Details, paper presented in workshop No. 3 entitled "Remediation Retrospective: What can we Learn from Failed Remediation Efforts", presented at the Association for The Environmental Health and Sciences 18th Annual Meeting on Soils Sediments and Water, held March 11, 2208, San Diego, CA

Participant in Workshop No. 11 entitled "Specialty Seminar on US EPA/ITRC Vapor Intrusion guidance Update" held on March 13, 2008 as part of the 18th Annual AEHS meeting entitled "Soils, Sediments and Water", San Diego, CA, 2008

"Barrier Monitoring Strategies for Hazardous, Solid and Radioactive Waste", L.G. Everett, Ninth West Coast Conference on Contaminated Soils and Water, AEHS, Oxnard, California, March 8, 1999

"Summary, Critique, and Recommendations Nuclear Chemistry, Speciation, Safe End Transport of Radionuclieds in the Vadose Zone", Invited workshop, Warsaw 98 Symposium, Sept 14, 1998, Warsaw

"Technical and Regulatory Breakthroughs in Vadose Zone Hydrology", L.G. Everett, The Seventh West Coast Conference on Contaminated Soils and Groundwater, Association for the Environmental Health of Soils, Oxnard, California, March 12, 1997

"Barrier Emplacement Quality Assurance and Monitoring Strategies", L.G. Everett, et al., 1997 International Containment Technology Conference and

Exhibition, Eight Hour Opening Workshop, St. Petersburg, FL, February 9, 1997

“Technical and Regulatory Breakthroughs in Vadose Zone Hydrology” L.G. Everett, The Sixth West Coast Conference on Contaminated Soils and Groundwater, Association for the Environmental Health of Soils, Newport Beach, California, March 12, 1996

"Risk Estimation Limitations", World Laboratory, Erice-Trappini, Italy, October 1995.

"Vadose Zone Remediation", Lawrence Livermore National Laboratory, March 1995.

Rocky Flats Solar Evaporation Ponds, Phase I Remediation Program "RCRA Closure Case Study", The Third EG&G GoCo Environmental Conference, Nevada, May 10, 1994.

"Recent Engineering Breakthroughs in Contaminated Soil Investigations" UCLA Environmental Engineering, Februrary 4, 1994

"Impact of Subsurface Hydrology" Fuel Bioremediation Workshop, Naval Facilities Engineering Servcie Center, Port Hueneme, CA, January 26, 1994.

"Site Mitigation Workshop" Santa Barbara Environmental Health Services department, Solvang, CA, October 1993.

"Vadose Zone Workshop" California Department of Toxic Substances Control, Sacramento, CA, June 27, 1993.

"Hydro-Geochemical Transport and Monitoring of Contaminants in the Vadose Zone", UCLA Extension, March 3, 1993.

Selected Projects

Hydrogeology

Lead Expert Witness in multi-million dollar PCB case wherein site characterization resulted in substantial cross-contamination. Extensive exposure to well development issues, well construction, sampling, decontamination, sample filtering, etc. related to PCB investigation. Extensive exposure to State and Federal PCB regulatory requirements and remediation alternatives.

Participant on Lawrence Livermore National Lab Scientific Panel who wrote both reports on the subject of petroleum hydrocarbon migration. These two reports have resulted in approximately a $1 billion dollar savings to industry in California alone. The reports have revolutionized the way petroleum hydrocarbon sites are characterized, remediated, and evaluated through risk considerations including natural attenuation.

Participant on National EPA/DOE VOC Panel which will look at natural attenuation associated with VOCs at 400 sites across America. Historical review of these sites will determine the efficacy of natural attenuation and will demonstrate the value of any consistency in the behavior of VOCs across the sites. Bottom line to industry will be a substantial reduction in the amount of characterization and possibly remediation required as a part of a VOC investigation.

Member of EPA/DOE Executive Committee on the establishment of barrier technologies at hazardous waste sites. Barrier technologies include, caps, wall, floors, conical shapes, and permeable systems including funnel and gate systems. Responsible for developing training positions on quality assurance/quality control of barrier placement and life cycle monitoring of barrier systems.

One of five members selected internationally by the International Atomic Energy Commission in Vienna, Austria to develop characterization and remediation strategies for radio isotope sites. Only American selected to participate on panel. Invitation stems from participation at the majority of the DOE sites in America.

Co-author of forthcoming EPA/RCRA guidance document related to requiring early alert monitoring concepts at all hazardous waste sites. Guidance document, once accepted, will result in a substantial reduction in the groundwater monitoring requirements, water quality monitoring requirements, insurance requirements, bonding, etc. Document under review at EPA headquarters within the Office of Solid Waste in Washington, DC.

Participant on Department of Defense Expert Committee looking at risk assessment of petroleum hydrocarbons at Air Force, Army, and Naval bases in America. Expert committee will develop recommendations related to natural attenuation and risk criteria to be utilized at Department of Defense sites through the United States.

Project Officer to design a vadose zone characterization program and monitoring system at Operable Unit 4 located at the DOE Rocky Flats Plant in Rocky Flats, Colorado. Project work involved development and implementation of a field investigation to identify contaminant release sources, a conceptual model of the subsurface geology, mechanisms and pathways for contaminant migration, candidate remedial approaches, and viable monitoring approaches during closure and post closure.

Co-author of a national EPA guidance document under RCRA Subtitle C entitled "Vadose Zone Monitoring at Hazardous Waste Sites". The work will be a compilation of research efforts conducted at the VZML and is mandated by the EPA's strong position on the merit's of vadose zone monitoring as a realistic and rational approach to prevention of contaminant migration to the nation's groundwater resources (under RCRA, Subtitle C) from hazardous waste landfill sources.
Project manager of a pilot vapor extraction and vapor recovery test to facilitate the final design of a recovery system for 26,000 bbl of petroleum reformate contaminating the vadose zone at a major oil refinery in Central California.

Co-Manager of a cooperative agreement between UCSB, USEPA, the US Bureau of Reclamation, and the US Air Force Space Command to develop Geographic Information Systems (GIS) suitable for use in decision-making in groundwater and vadose zone characterization and remedial investigations.

Hosted the six-month stay in the USA of Dr. Igor Seminovich Zektster, Head of the Hydrogeological Division of the Russian National Academy of Sciences in Moscow, USSR. The purpose of the stay was to begin scientific collaboration between the USA and USSR on issues pertaining to groundwater pollution. During the period, two interpretive groundwater maps of California and two proposals for similar work pertaining to the entire USA were developed.

Full Research Professor and Director of the Vadose Zone Monitoring Laboratory of the Institute for Crustal Studies at the University of California at Santa Barbara.

Led a team of hydrogeologists, engineers, and chemists in site characterization, monitoring, and remediation of hazardous and solid waste landfills, refinery and industrial sites, underground storage tank sites, and dense non-aqueous phase liquid investigations. Extensive experience was developed in post-closure monitoring strategies.

Principal Investigator to evaluate groundwater and vadose zone contamination associated with a major municipal landfill.

Project Manager to develop vadose zone monitoring program demonstration at Class I site, California.

Project Manager to evaluate groundwater and vadose zone monitoring program at a Class I site for Hazardous Waste Disposal, California.

Program Manager to develop soil-gas, groundwater and vadose zone monitoring program for six solid waste sites under the Calderon Bill.

Numerous refinery companies throughout nation: Project Manager to conduct Part B Permits, hydrocarbon removal and mitigation, landfill impoundment and landfarm closure, landfarm demonstrations, hydrocarbon migration investigations, soil venting and bacterial hydrocarbon degradation, and underground storage tank leakage evaluations.

Senior advisor for development of multistate hydrologic study covering long-term use of the Ogallala Formation

Program Manager for evaluation of hydrologic aspects of uranium mine permit requirements.

Responsible for developing ASTM National Standards for soil core monitoring, soil pore-liquid monitoring, hydraulic conductivity measurement, matric potential measurement, neutron moderation, soil gas monitoring, air permeability determination, soil moisture measurement, and field screening techniques.

Fortune 500 Industrial CERCLA site contaminated with chlorinated hydrocarbons. Technical Advisor in the site characterization, monitoring, remediation, and presentations to regulatory agencies. Technical Advisor on vadose zone remediation strategy and groundwater pump and treat strategy. Project costs estimated at $30 million.

Program Manager to evaluate Part B Permit and to develop groundwater and vadose zone monitoring program at Class I site, Oregon.

Hydrocarbons

Major oil company (confidential). Pipeline leak of 55,000 barrels of gasoline. Technical Advisor on site characterization, monitoring, and remediation program. Technical Advisor on major vapor extraction system for area 90 feet deep and 25 acres in size. Technical Advisor on major pump and treat bioremediation program estimated at $14 million.

Principal Investigator to develop a Guidance Document and videos relative to all aspects of underground storage tank site characterization, monitoring, testing, installation, abandonment, and remediation.

Conducts a major research program directed towards soil-gas migration, soil pore-liquid migration, underground tank monitoring system evaluation, hydrocarbon remediation, and sensor installation techniques.

Expert Witness

Expert Witness in successful case for the plaintiff ($23 million award) in a major stoddard solvent and TCE/PCE groundwater and vadose zone investigation.

Expert Witness in successful case for the plaintiff ($80 million case) relative to a major unleaded tank leak from a service station.

Expert Witness for the defendant in a successful defense of an unleaded tank leak from a service station.

United States Environmental Protection Agency

Co-Principal Investigator to evaluate the U-tube design for underground monitoring systems for soil vapor testing.

Co-Principal Investigator of underground tank vapor monitoring systems by tracer testing methods.

Project Manager of program to test groundwater monitoring equipment to be used at hazardous waste sites.

Project Manager of program to develop vadose zone monitoring programs for hazardous waste landfills, impoundments and land treatment units.

Project Manager of program to develop an unsaturated zone monitoring manual

Project Manager of $2.0-million contract to develop groundwater quality monitoring guidelines for all western coal strip mine activity and all four of the Federal oil shale tracts.

Project Manager for a conceptualization of unsaturated zone monitoring applicable to hazardous waste sites.

Project Manager for state of the art review of unsaturated zone monitoring techniques.

Project Manager of computer interactive system study to design groundwater quality monitoring programs.

Program Manager for groundwater quality monitoring guidelines for secondary impacts of western coal strip mining, potential sources of contamination.

Development of general methodology for groundwater quality monitoring.

Principal Investigator of Waste Load Allocation Study, Parker Strip, Colorado River.

United States Department of Defense

Scientific Advisor to major Naval installation covering inorganic hazardous waste hot spots, leaking underground storage tanks, dense phase organic solvents, and a RCRA landfill sitting on top of a Superfund site.

Scientific Advisor to major site investigation and remediation program associated with historic fuel and solvent releases and waste disposal practices.

Environmental Impact Statements

Dr. Everett was responsible for hydrologic research including both groundwater and surface water impacts for the following Environmental Impact Statements:

City of Los Angeles, California, Total Facilities Wastewater Plan (25-year Reclamation Plan)

Fort Calhoun Nuclear Generating Station Unit 2, Missouri

Omaha Public Power District, Nebraska City Fossil Fuel Power Plant

Texarkana Wastewater Treatment Facility, Texarkana, Texas

Texarkana Water Treatment Facility, Texarkana, Texas

Commerce Wastewater Treatment Facility, Commerce, Texas

Sanitary Sewage Collection System, Highland Village, Texas.

National Committees

Dr. Everett is a reviewer for reports prepared under the auspices of the National Research Councils Board on Environmental Studies and Toxicology, National Research Council Washington DC 2005

National Environmental Technology Test Site, L.G. Everett, Petroleum Environmental Research Forum, December 2, 1998, Pt Hueneme, CA

Groundwater and Vadose Zone Monitoring, L.G. Everett, Chairman, ASTM, January 25-27, 1999, Memphis, TN

American Society for Testing and Materials, Board of Directors, April 26-27, 1999, West Conshohocken, PA

Groundwater and Vadose Zone Monitoring, L.G. Everett, Chairman, ASTM, June 29, 1999, Seattle, WA

American Society for Testing and Materials, Board of Directors Meeting, L.G. Everett, member Board of Directors, West Conshohocken, PA, October 11-12, 1999

National Environmental Technology Site Science Advisory Board Meeting, L.G. Everett, member Science Advisory Board, University of Massachusetts, Amherst, Massachusetts, October 18-19, 1999

Groundwater and Vadose Zone Monitoring, L.G. Everett, Committee Chairman, January 24-25, 2000 ASTM

Naval Hydrocarbon Test Site Science Advisory Board Meeting, March 20, 2000, United States Navy, San Diego, CA

American Society for Testing and Materials, Board of Directors Meeting, October 17-18, 2000, West Conshohocken, PA

Inter Agency DNAPL Consortium, Technical Advisory Group, October 25-26, 2000, Atlantic City

Groundwater and Vadose Zone Monitoring, L.G. Everett Chairman, ASTM, Reno, NV, January 23, 2001

Groundwater and Vadose Zone Monitoring, L.G. Everett, Chairman, American Society for Testing and Material Meetings, Norfolk, VA, June 26, 2001

Invited Member Scientific Advisory Committee International Conference on Advances in Groundwater Hydrology, Dedicated to C.V. Theis, American Institute of Hydrology, November 16-20, 1997, Tampa, FL

Member, DOE Executive Committee, for 1997 International Containment Technology Conference and Exhibition.

Session Chairman, Hazardous Materials Control Research Institute, National R&D Conference on Control of Hazardous Materials Soil Washing and Slurry Reactor Bioremediation, February 1992, Fairmont Hotel, San Francisco, California.

American Society for Testing Materials (1986-Present): Section Chairman D.18.21.02 entitled Vadose Zone Monitoring.

Invited Panel Member: Future of Environmental Cleanup in Developing Countries, International School of Innovative Technology for Cleaning the Environmental, Ettore, Majorana Center for Scientific Culture, Erice, Sicily, Italy, April 22-29, 1992.

Invited by Commission of the European Communities, Joint Research Center, to present Innovative Monitoring Strategies, September 21-25, 1992, ISPRA (Varese), Italy.

Recipient of Standards Development Award, American Society for Testing and Materials, January, 1992, New Orleans Annual Society Meeting.

Invited Session Chairman, ETEX 91, (Environmental Technology Exposition and Conference on Physical Remediation Technologies, Sands Expo and Convention Center, Las Vegas, Nevada, March 13-15, 1991.

Invited Session Chairman on Vadose Zone Investigation Methods in Symposium on Groundwater and Vadose Zone Investigations, sponsored by ASTM, The Sheraton Harbor Island Hotel, San Diego, California, January 30 - February 1, 1991.

Invited Chairman, symposium on Standards Development for Groundwater and Vadose Zone Monitoring Investigations, ASTM, January 27-29, 1988, Albuquerque, NM.

Elected Chairman of ASTM National Task Force to write Vadose Zone Monitoring Standards, ASTM, Tampa, Florida, February 1987.

Invited Panel Member for EPA Technology Transfer Symposium on Construction of Monitoring Wells and Considerations for Collection of Groundwater Samples, UNLV, November 19, 1986.

Invited Panel Chairman by the California Department of Water Resources to review groundwater pollution detection techniques to be used in California over the next 25 years, San Diego, September 1985.

Invited Blue Ribbon Panel Member to oversee State of California Legislation to maintain integrity of state's water resources.

Recent International Activities

America's Illogical Monitoring Philosophy, L. G. Everett, World Laboratory, August, 1999, Erice, Italy

World Laboratory Meeting, Member Permanent Panel on Pollution, "The Science City", August 19, 1999, Erice, Italy

MTBE-The Mega City Public Health Debacle, L.G. Everett, International Seminar on Nuclear War and Planetary Emergencies, World Laboratory, E. Majorana, Center for Scientific Culture, August 19-24, 1999, Erice, Italy

Response prepared for Professor Anthony Zichichi, President of the Science Steering Committee for Italian Science to the President of Italy, presentation materials covered contamination associated with unleaded fuel, January 2000

Groundwater and Vadose Zone Monitoring, Committee Meeting, L.G. Everett, Chairman, June 20, 2000, Toronto, Ontario, Canada

World Federation of Scientist Meeting, Permanent Panel on Global Pollution, L.G. Everett, Panel Member, August 19, 2000, Erice, Italy

Invitation to the Scientist Jubilee on Planetary Emergencies, by the Chairman and Director of the World Federation of Scientists, to participate in the Black Sea Pollution Panel meetings, August 19-24, 2000, Erice, Italy

An Inquiry into the Problem of Waste Disposal; The Toronto and Kirkland Lake Case, report prepared by Lakehead University Engineering Technology, Project Advisor, L.G. Everett, Fall, 2000, Lakehead University, Ontario Canada

Hazardous Waste and Groundwater Monitoring, L.G. Everett, 39th Engineering and Technology Conference, Ontario Professional Engineers, November 3, 2000, Thunder Bay, Ontario, Canada

Invited peer reviewer, Ontario Brownfields Amendment Act and Contaminated Sites Guidelines, Association of Professional Geoscientists, Ontario, Canada, June 2001

Pulp and Paper Technical Association of Canada, Banquet Speaker, Thunder Bay, Canada, June 1, 2001

Executive Committee, 2001 International Containment and Remediation Technology Conference and Exhibition, June 10-13, 2001, Orlando FL

Chairman, Vadose Zone Issues Influencing Remediation II, Session 24, 2001 International Containment and Remediation Technology Conference and Exhibition, June 12 2001, Orlando FL

Scientific Advisory Board, 1st International Congress on Petroleum Contamination Soils, Sediments and Water, American Institute of Hydrology, Imperial College, August 2001, London, United Kingdom

Request from Dr. Andres Mako, Pate University of Agricultural Sciences, Deak Hungary, to spend six months sabbatical in my Vadose Zone monitoring lab in the Fall of 1999

Invited by DOE to be the moderator of the Vadose Zone Workshop for Warsaw '98 Symposium, September 14, 1998, Warsaw

Hosted Fullbright Scholar from the Russian Academy of Sciences, specifically Dr. Igor Zektser head of the Russian Academy, Water Problems Institute in Moscow, specifically requested an eight month approval to work in the Vadose Zone Monitoring Lab with Dr. Everett, June 1998.

Invited by Dr. Antonino Zichichi, President of the World Laboratory in Geneva, Switzerland to participate in World Laboratory Meetings on November 21-22, 1997 as a member of the World Federation of Scientist Monitoring Panel on Water and Pollution.

Invited by Dr. Don Clark, head of characterization and monitoring for the International Atomic Energy Commission in Vienna, Austria, to participate on characterization panel for IAEC, 1997.

Elected Member, Russian Academy of Sciences (only eight Americans have been elected to the Russian Academy of Sciences since its founding by Peter the Great in 1725).

Invited by NATO to evaluate environmental problems at NATO bases in the Mediterranean Sea, 1996.

Member, Executive Committee, American Institute for Hydrology for International Symposium in Tashkent, Ubekistan, 1996.

Co-editor of World Groundwater Map developed for UNESCO, 1996.

Member, Editorial Board, UNESCO International Hydrological Program for International Monograph entitled "Groundwater Resources of the Earth", 1996.

Invited co-advisor on doctoral students at the Weisman Institute and the Ben Gurian University in Israel.

Invited Speaker at the Land and Ocean Interaction in the Coastal Zone (LOICZ) Workshops held in Holland and Moscow, 1996. The LOICZ International Core Project is headquartered in the Netherlands.

Recipient of Honorary Doctor of Science from Canadian University for Excellence in Hydrogeology, 1996.

Invited by the World Lab to give paper on the subject of "Weaknesses in Risk Calculations in the Vadose Zone" given in 1995 in Erice, Trapini, Sicily

Invited Speaker by the United Nations for International Workshop held in Costa Rica, 1994.

Invited by the European Community to give Environmental Monitoring presentations at Ispra, Italy, 1993.

Recipient distinguished alumni award Lakehead University, Canada, 1993.

Work Experience

L. Everett & Associates, LLC (2010-Present) President and CEO

Haley & Aldrich, Inc. (2005 to 2010) Chief Scientist and Sr. VP

Shaw Environmental & Infrastructure Inc. (2002 to 2005) Chief Scientist and Sr. VP

The IT Group (June 2000 - 2002) Chief Scientist & Sr. Vice President

Participate in development and implementation of a strategic vision and business plan to support the Santa Barbara office. Lead marketing and business development, identify and pursue strategies, acquisitions, and relationships for the IT Group. Participate in the senior management leadership team for C&T in the development and realization of a $100 million per year consulting business. Create and implement strategies for market penetration for federal high end consulting and R&D. Actively participate in DOD and DOE business development and key opportunities. Chairman of IT's National Practice Programs for air quality, risk assessment, natural resources, pollution prevention, subsurface characterization, and legal services. Lead the development and application of innovative remediation and other environmental technologies and application as chief scientist, mentor, and lead key technical staff.

Chairman Technology Exchange Program. The Exchange Program groups include: air quality,

analytical methods, audit and compliance, dredging and contaminated sediment management, document production and publishing, ecological risk assessment, due diligence, engineering geology, environmental community relations, environmental contaminate, environmental statistics, fate and transport modeling, GIS, groundwater management, health physics, human health risk assessment, insitu and exsitu remediation, information technology, investigative methods, mining, next/rad waste, natural resources, pollution prevention, regulatory, strategic environmental management, thermal treatment, UXO technology review board, water/wastes water engineering and management, and web technology.

ARCADIS Geraghty & Miller (1992-2000)

Chief Research Hydrologist and Sr. Vice President

As Chief Research Hydrologist, Dr. Everett was responsible for developing technical solutions to complex questions related to biological, chemical, radiological and hydrological problems throughout America.

As a Senior Advisor to the Pentagon, the U.S. Navy, DOE and NASA, Dr. Everett was responsible for making recommendations on innovative characterization, monitoring and remediation strategies.

As an expert witness, Dr. Everett lead, back to back, billion dollar litigation cases related to contaminant migration in the subsurface. His expert witness activity was strongly supported by his development of over 10 ASTM Soil and Groundwater Standards.

Metcalf &Eddy (1989-1992):

Chief Scientist and Vice President

As Chief Scientist, Dr. Everett was involved in numerous complex CERCLA and RCRA activities involving over $300 million in fieldwork per year. As a key member of Metcalf & Eddy's Technical Advisory Teams, he was intimately involved with the technical issues related to site characterization, monitoring, and remediation. Selected examples of Dr. Everett's CERCLA and RCRA activity include:

Fortune 500 Industrial CERCLA site contaminated with chlorinated hydrocarbons. Technical Advisor in the site characterization, monitoring, remediation, and presentations to regulatory agencies. Technical Advisor on vadose zone remediation strategy and groundwater pump and treat strategy. Project costs estimated at $30 million.

Major oil company (confidential). Pipeline leak of 55,000 barrels of gasoline. Technical Advisor on site characterization, monitoring, and remediation program. Technical Advisor on major vapor extraction system for area 90 feet deep and 25 acres in size. Technical Advisor on major pump and treat bioremediation program estimated at $14 million.

Monitoring and Remediation Training Programs for UCSB, USC, USAF, USEPA, USNAVY, U.S. Corps of Eng., etc. Dr. Everett developed and presented training programs sponsored by the NWWA and ASTM on the subject of Vadose Zone (Early Alert) Monitoring for Hazardous and Solid Waste Sites.

Monaghan & Metz, Attorneys at law, San Diego, California: Expert Witness in successful case for the plaintiff ($23 million award) in a major stoddard solvent and TCE/PCE groundwater and vadose zone investigation.

Schramm & Raddue, Santa Barbara, California: Expert Witness in successful case for the plaintiff ($80 million case) relative to a major unleaded tank leak from a service station.

Texaco, Inc., College Station, Texas: Expert Witness for the defendant in a successful defense of an unleaded tank leak from a service station.

Los Angeles Fire Department, Los Angeles, California: Principal Investigator to develop a Guidance Document and videos relative to all aspects of underground storage tank site characterization, monitoring, testing, installation, abandonment, and remediation.

U.S. Navy, Mare Island, California: Scientific Advisor to major Naval installation covering inorganic hazardous waste hot spots, leaking underground storage tanks, dense phase organic solvents, and a RCRA landfill sitting on top of a Superfund site.

American Society for Testing Materials (1986-Present):

Section Chairman D.18.21.02 entitled Vadose Zone Monitoring

Dr. Everett is responsible for developing ASTM National Standards for soil core monitoring, soil pore-liquid monitoring, hydraulic conductivity measurement, matric potential measurement, neutron moderation, soil gas monitoring, air permeability determination, soil moisture measurement, and field screening techniques.

University of California at Santa Barbara (1985-2002):

Research Hydrologist and Director of the Vadose Zone Monitoring Laboratory of the Institute for Crustal Studies

On a part-time basis, Dr. Everett conducts a major research program directed towards soil-gas migration, soil pore-liquid migration, underground tank monitoring system evaluation, hydrocarbon remediation, and sensor installation techniques.

Kaman Sciences (1984-1989):

Assistant Vice President

Dr. Everett led a team of hydro-geologists, engineers, and chemists insite characterization, monitoring, and remediation of hazardous and solid waste landfills, refinery and industrial sites, underground storage tank sites, and dense non-aqueous phase liquid investigations. Extensive experience was developed in post-closure monitoring strategies.

Natural Resources Program

Kaman Tempo (1978-1989): Manager,

Dr. Everett prepared RCRA Part B permits and Hazardous Waste Land Treatment Demonstrations for numerous clients including Texaco, Conoco, Amoco, Hunt Oil, Murphy Oil, Tosco, IMC Carbon, Bekin Oil, Golden Bear Refinery, and General Portland Cement (hazardous waste incinerator). He has conducted turn key monitoring programs at numerous solid waste landfills, hazardous waste disposal sites and underground storage tank leak sites. Dr. Everett participated as an expert panel chairman and panel member on many occasions. He testified before the U.S. Congress on different occasions and was an expert witness for the U.S. Department of Justice, Attorney General of California, etc. Dr. Everett was a specialist and advisor to the EPA Technical Assistance Team for Emergency Response Removal and Prevention. In addition, Dr. Everett was a Special Advisor to the GCA Corporation relative to dioxin monitoring at Superfund sites. Dr. Everett was selected on a sole-source basis to write guidance manuals and to present training programs for EPA, United States Navy Hazardous Waste Team, California Water Resources Control Board, California Department of Health Services, all 10 EPA Regional Headquarters, University of California at Davis and U.S. Naval Petroleum Reserve, Elk Hills, California: Scientific Advisor to the evaluation and cleanup of over 30 hazardous waste sites at Naval facilities.

Selected Project Listings with Kaman:

Project Title	**Client**
Groundwater Pollution	EPA
Unsaturated Zone Monitoring Manual	EPA
Environmental Assessment Review	Nerco Inc.
Alluvial Valley Floor Study	Northern Coal
Sand Wash Permit	Tosco Corp.
Agriculture Development Study	Yankton Sioux Tribe
Gold Tailings Study	Council of Energy Resources Tribe
Cumulative Hydrologic Impact	Radian/OSM
Maria Verde EIR	Human Environmental Resources Corp.
Antelope Mine Permitting Consulting	Nerco
Hydrologic Evaluations	Grand Mesa Coal Company
Hydrologic Impact	Flatiron Sand & Gravel
Water Well Development	L. Kavian
Reconnaissance of Alluvial Valley Floor Assessment and Spring Inventory	Powderhorn Coal Co.
Youngs Creek Mine Hydro/THE Investigation	Radian/OSM

Reclamation Strategies	Earth Resource Assoc.
Hydrologic Baseline Program	Dorchester Coal Co.
Agricultural Economic Analysis	Yankton Sioux Tribe
Agriculture Economic Development	Cheyenne River Sioux Tribe
AVF Applicability Study	ACZ Inc./Bookcliffs
General Requirements for AVFs	U.S. Depart. Of the Interior
PHC/CHIA Program	U.S. Department of the Interior
AVF Determination	Pittsburg & Midway Coal Mining Co.
Cumulative Hydrologic Impact Assessment	J.F. Sata & Associates
Hydrologic Evaluation	Sunedco
Cumulative Hydrologic Study	Nerco
Snowmass operating Permitting Assistance	Snowmass Coal Company
Hydrologic Assistance	Tosco Corp.
Technical Editing/Hydrologic Evaluation Services	Sunedco
Technical Assistance-San Juan Mine Plan Review	U.S. Dept of the Interior
Application to RWQCB	Tosco
Unsaturated Zone Training Program	TRW Energy Development
Ft. Belknap Indian Reservation Mining Activity Imp. Assessment	Earth Resources Associates
Technical Assistance-Surface Mining Control and Reclamation	Radian/OSM
Monitoring Wells Installation at Fruita Mine	Dorchester
Surface Hydrologic Evaluation/ Mine Drainage Plans	State of Colorado
Conduct Aquifer Test for Hazardous Waste Facility	MCI/Consulting Engineers Inc
Tower/Greenwood Irrigation System	Yankton Sioux Tribe
AVF Consulting Services	CONSOL
Environmental Compatibility of Coal Leasing	OTA
Water Resource Review of EIS	Council of Energy Tribes (CERT)
Geomorphic Evaluations	Empire Energy Corporations
Water Resource and Contamination Assessment Program	Tosco
Contamination Assessment Program Plan	IMC Industry Group
Montco Mine Permit Application	Northern Plains Res Council
Technical Assistance-Response to AVF Question	Consolidated Coal Company
Containment Assessment Program	Beacon Oil
CHIA Consultation	J.F. Sato & Associations
Assessment of Impacts on Water Resources-Crandon Project	CERT
Hydrologic Evaluation	Syntex Chemicals, Inc
Santa Monica Creek Water Diversion	Chevron
Regulatory Assistance to Rockcastle Coal Company	Intermountain Soils
Hydrologic assistance	CERT
Montana EIS	Intermountain Soils
Vadose Zone Monitoring/Permit Applications	General Portland
Neoshe Vadose Zone Monitoring	GCA Technology Division
CAP Support	IMC Industry Group

Texaco Louisiana Refinery	NUS Corporation
Aquifer Characterization Facility-Arlington, OR	Chem-Security Systems
Vadose Zone Monitoring	Chemical Waste Management, Inc.
Soil-Pore Moisture Samples	The University of Oklahoma
Evaluate Pollulert Fluid Detection Systems	Pollulert Systems (Mallory Components)
Evaluate Contamination for City of Hastings, Nebraska	Roy F. Weston, Inc.

Des Moines, Public Works Department, Des Moines, Iowa: Principal Investigator to evaluate groundwater and vadose zone contamination associated with major municipal landfill.

Major oil company: Scientific Advisor to major soil venting and bioremediation investigation covering a refinery spill of over 55,000 barrels. Location: Company Confidential. State: Company Confidential.

U.S. Environmental Protection Agency, Kansas City, Kansas: Co-Principal Investigator to evaluate the U-tube design for underground monitoring systems for soil vapor testing.

U.S. Environmental Protection Agency, Suffolk County, New York: Co-Principal Investigator of underground tank vapor monitoring systems by tracer testing methods.

Mid-West Research Institute, San Jose, California: Co-Principal Investigator of diurnal variation and background fuel vapor concentrations in underground tank backfill.

U.S. Air Force, Edwards Air Force Base, California: Scientific Advisor to major site investigation and remediation program associated with historic fuel and solvent releases and waste disposal practices.

Hyatt Corporation: Principal Investigator to conduct major site characterization and remediation programs for proposed Hyatt Regency sites in Los Angeles, Santa Barbara, and San Francisco, California.

Chem-Waste Management: Program Manager to evaluate Part B Permit and to develop groundwater and vadose zone monitoring program at Class I site in Arlington, Oregon.

Chem-Waste Management: Project Manager to develop vadose zone monitoring program demonstration at Class I site, Kettleman Hills, California.

Santa Barbara County Department of Health: Project Manager to evaluate groundwater and vadose zone monitoring program at Casmalia Hazardous Waste Disposal Site (Class I), Casmalia, California.

Los Angeles County Sanitation District: Program Manager to develop soil-gas, groundwater and vadose zone monitoring program for six solid waste sites under the Calderon Bill.

Kern County Planning Department: Program Manager to develop hazardous waste siting element for County General Plan, Bakersfield, California.

(Confidential) Aerospace Corporation: Program Manager to evaluate TCE, heavy metal, and benzene, toluene, xylene contamination at sites in Connecticut.

Numerous refinery companies throughout nation: Project Manager to conduct Part B Permits, hydrocarbon removal and mitigation, landfill impoundment and landfarm closure, landfarm demonstrations, hydrocarbon migration investigations, soil venting and bacterial hydrocarbon degradation, and underground storage tank leakage evaluations.

IT Corporation: Prepared and presented extensive vadose zone monitoring training programs to hazardous waste staff, Los Angeles, California.

TRW Inc.: Project Manager of program to develop and present groundwater monitoring training program for hazardous waste sites at all 10 EPA regional offices.

Environmental Protection Agency: Project Manager of program to test groundwater monitoring equipment to be used at hazardous waste sites.

Environmental Protection Agency: Project Manager of program to develop vadose zone monitoring programs

for hazardous waste landfills, impoundments and land treatment units.

Environmental Protection Agency: Project Manager of program to develop an unsaturated zone monitoring manual

Environmental Protection Agency: Project Manager of $2.0-million contract to develop groundwater quality monitoring guidelines for all western coal strip mine activity and all four of the Federal oil shale tracts

Environmental Protection Agency: Project Manager for a conceptualization of unsaturated zone monitoring applicable to hazardous waste sites

United States Congress: Invited testimony at hearings on the Draft Bill entitled,"Environmental Monitoring of Management Act of 1978," U.S. House of Representatives, 95th Congress, 2nd Session, 1978

Environmental Protection Agency: Project Manager for state-of-the-art review of unsaturated zone monitoring techniques

Environmental Protection Agency: Project Manager of computer interactive system study to design groundwater quality monitoring programs.

Crow Indian Tribe: Development of information system covering all coal resource data

Camp, Dresser & McKee: Senior advisor for development of multistate hydrologic study covering long-term use of the Ogallala Formation

Nuclear Regulatory Commission: Program Manager for evaluation of hydrologic aspects of uranium mine permit requirements.

General Electric TEMPO

(1976-1978): Manager, Water Resources Program
Environmental Protection Agency: Program Manager for groundwater quality monitoring guidelines for secondary impacts of western coal strip mining, potential sources of contamination

Department of Justice: Project Manager for quantification of surface water, groundwater, and water quality to support Indian water rights litigation.

General Electric TEMPO (1974-1976):

Hydrologist
Environmental Protection Agency: Development of general methodology for groundwater quality monitoring.

Consultant to:

CODECU International, Inc., Tucson, Arizona

Henningson, Durham & Richardson, Santa Barbara, California

Bell Engineering, Tucson, Arizona.

University of Arizona (1972-1974)

Assistant Professor, Department of Hydrology and Water Resources.
Principal investigator to:

Environmental Protection Agency: Principal Investigator of Waste Load Allocation Study, Parker Strip, Colorado River

Bureau of Reclamation, Arizona Water Commission: Principal Investigator of Water Quality Intake Studies for the Central Arizona Project

Arizona Water Resources Research Center: Principal Investigator of Salinity and Limnological Problems on the Lower Colorado River

National Park Service: Principal Investigator of Public Health Problems in Grand Canyon, Arizona

Bureau of Reclamation, Region III: Principal Investigator of Chemical and Biological Patterns in Lake Mead.

Great Lakes Paper Co., Ltd. (1966-1967): Water quality of effluent from paper mills.

Ontario Hydro Co., Ltd. (1963-1966): Watershed studies to predict reservoir levels behind dams.

Honors and Awards

Dr . Everett was invited by Professor Dr. Antonino Zichichi, President, World Federation of Scientists, and Macello Sanchez Sorondo, Chancellor, Pontifical Academy of Sciences to participate in the Official Celebration for the Ettore Majorana-Erice-Science for Peace Prize “2009”. The ceremony was held in January

2011 at the Pontifical Academy of Sciences, in the Vatican (Rome).

Invited member of International Advisory Panel, Institute of Engineers, Malaysia, for Brownfields Asia 2008, October 21-23 2008, Kuala Lumpur, Malaysia.

Paper reviewer and member of the Editorial Board for the International Journal entitled "Soil & Sediment Contamination" published by Taylor and Francis, 2008.

"Devil in the Details" AEHS, San Diego, CA March 11, 2008

Presented the Pollution Annual Report of the Permanent Monitoring Panel to the World Federation of Scientists in Erice, Italy. Presentation was made as Co-Chair of the WFS Pollution Panel. August 24, 2007

Presented the Annual Report to the General Assembly of the World Federation of Scientists on August 23rd, Erice, Italy 2007.

Co-chaired workshop on pollution for the World Federation of Scientist, Erice, Italy, August 18, 2007.

Presented the Annual Report to the General Assembly of the World Federation of Scientists on August 23rd, Erice, Italy 2007.

Co-Chaired with R. Ragaini and Chairman A. Zichichi the Session #9 entitled "Global Monitoring of the Planet Focus: The North Pole and Life Cycle Nuclear Energy Environmental Issues" Presented at the 38th Session of the Erice International Seminars in Erice, Italy. August 22, 2007

Co-Chaired with Dr. Richard Ragaini the Workshop on World Pollution in Erice, Italy. August 19, 2007

Voting member of ASTM Subcommittee E50-02 relative to the new "Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions" WK12967, ASTM International, August 2007

Chaired the Vadose Zone Monitoring Task Committee meeting for D18.21.02, Norfolk, VA, June 24-27, 2007

Participated on the editorial board of the journal titled "Soil and Sediment Contamination, an International Journal", published by Taylor and Francis, 2007

Keynote luncheon speaker Brownfields University, Phoenix, AZ. "Emerging Environmental Issues". April 17, 2007

Chaired the Vadose Zone Monitoring Task Committee meeting for D18.21.02, Anaheim, CA, January 28-31, 2007

Member and Co-Author of the National Groundwater Association Subcommittee on Groundwater Monitoring (Field Practices Quality) Framework charged to develop and encourage implementation of a nationwide, long-term groundwater quantity and quality monitoring framework that would provide information necessary for the planning, management, and development of groundwater supplies to meet current and future water needs, and eco system requirements. This program was developed under the advisory committee on water information developed under the US Department of the Interior through the USGS Water resources discipline and created by the Office of Management and Budget memorandum number M92-01. This subcommittee was established in January 2007

Keynote address Brownfield Asia 2006, Kuahla Lumpur Malaysia, entitled "Groundwater Monitoring, a Brownfields Litigation Case Study". September 5-7, 2006

Co-chaired with F. vom Saal and Chairman A. Zichichi Session No. 6 on Pollution, Focus: Plastic Contaminants in Water. World Federation of Scientists, Erice, Italy, August 22, 2006

World Federation of Scientists, Permanent Monitoring Panel on Pollution, Dr. Lorne Everett, leader. World Federation of Scientist Task Force on Groundwater Vulnerability in Sicily. Presentations to the Flood and Pollution Monitoring Panels, Erice, Italy. August 19, 2006

Chaired the Vadose Zone Monitoring Task Committee meeting for D18.21.02, Toronto, Canada, June 11-15, 2006

Chaired the Vadose Zone Monitoring Task Committee meeting for D18.21.02, Phoenix, AZ, February 5-9, 2006

Presentation to Gallagher and Kennedy entitled "Vision Service", Phoenix, AZ, February 2006

Invited to membership in Canadian Who's Who, University of Toronto Press, Inc. Toronto, Ontario, Canada, 2006

"Long Term Stewardship of Radioactive and Hazardous Waste Sites", L.G. Everett, invited plenary platform presentation, the First International Conference on Environmental Science and technology, sponsored by the American Academy of Sciences, New Orleans, Jan 23-26, 2005

U-Plant area reviewer for the "U-Plant Surface Barrier Monitoring Data Quality Objectives" report for the US Department of Energy facility at Hanford, WA, February 2005

Invited reviewer for the National Research Council Review of the final report entitled "Superfund and Mining Mega Sites- Lessons from the Coeur d'Alene River Basin", February 2005

Received a "No Further Requirements" letter from the California Regional Water Quality Control Board relative to the Hawker Pacific Aerospace Facility in Sun Valley, CA, March 2005

Participated in the Shaw Environmental and Infrastructure 2005 Symposium for 19.5 professional development hours, Orlando, FL. April 14-16, 2005

Chaired the Shaw Environmental and Infrastructure 2005 Symposium session entitled "Emerging Contaminants", Orlando, FL. April 14-16, 2005

Chaired the Vadose Zone Monitoring Task Committee meeting for D18.21.02, Reno, NV, June 12-15, 2005

"Subsurface Laser Drilling Application", R. Parker and L. Everett, presented at the World Federation of Scientist meeting , Erice, Italy 2005

National Co-Chair, 40th Anniversary Executive Planning Committee, Lakehead University, Thunder Bay, Ontario, Canada, 2005

Invited manuscript reviewer, Journal of the Air and Waste Management Association, 2005

Invited representatives from Japan, Russia, England, Canada, America, etc. to meet in Science City in Italy to look at radioactive waste repository designs and innovative monitoring technologies, 2005

As a research professor successfully guided Dr. Mark Kram (former Senior Hydrogeologist, US Navy, Port Hueneme) to complete his Ph.D. dissertation. Dissertation focuses on the use of 6 different lasers which will optimize the fluorescent signature associated with different carbon ranges of hydrocarbon contamination. 2005

Invited by Professor Antonino Zichichii, President of the World Federation of Scientists, to participate in meetings at the Palazzol La Farnesina to celebrate Enrico Fermi's main achievements, the 50th Anniversary of CERN, the 25th Anniversary of the Revival of the Instituto Nazionale di Fisica Nucleare, and the World Federation of Scientists Multidisciplinary Core Group and the International Laboratory for Science, Engineering and Advanced Physical and Biomedical Technologies (ILSEAT), December, 2004

Participated as a member of Department of Energy's Executive Panel on document entitled "Long Term Stewardship- Science and Technology Roadmap. This Roadmap identifies the technologies and milestones needed to cleanup Department of Energy sites. 2004

Invited moderator in April 2004 for the joint workshop on Long Term Performance Monitoring of Metals and Radionuclide in the Subsurface: Strategies, Tools and Case Studies. Invited by USGS, DOE, EPA, and NASA to lead workshop and to provide the charge to the participants. 2004

Personally responsible for signing an indefinite time MOU between the United States Navy and the University of California. The MOU will result in the creation of a Permeable Reactive Barrier Institute and a program focusing on current and projected environmental support needs for the United States Navy. 2004

Hosted Fulbright Scholar Dr. Igor Simonovitch Zektser, Head of the Russian Academy of Sciences Water Problems Institute, in Santa Barbara for the last 8 months. Worked on identifying opportunities and developing the appropriate contacts for major remediation programs in the former USSR. 2004

Presented recommendations in new book entitled "International Seminar on Nuclear War and Planetary Emergencies-30th Session". Recommendations include the results of an international workshop orchestrated by Dr. Everett on the subject of Long Term Stewardship and Monitoring of Radio Active and Hazardous Waste in Erice, Italy August 18-26, 2003

General Advisor, First International Congress on Petroleum Contaminated Soil, Sediments, and Water, London, U.K. August 14-17, 2001

Invited Participant Workshop on Principles and Operational Strategies for Repository Staging Systems, the National Research Council Board on Radioactive Waste Management, Washington, D.C., September 5-6 2001

Member of the Editorial Board of the journal, Environmental Forensics, Academic Press, December 1999

Kapitsa Gold Metal, Russian Academies highest award for original research formally presented in Lousanne, Switzerland, October 1999

Elected to the Centennial Board of Directors of ASTM for the period 1998-2001 by 33,000 membership

Nominated by Dr. Henry T. Yang, Chancellor, as a candidate for the Tyler Prize.

“Recent Breakthrough Opportunities in Environmental and Civil Engineering”, L.G. Everett, USC-School of Engineering, invited presentation from Dean of Engineering School, Los Angeles, California, March 26, 1999

Requested by Dr. Ken Brooks, Chairman, Board of Registration, American Institute of Hydrology, to annually submit questions for -State of Wisconsin Examination for Hydrologists, March 1999

“Decision Criteria Relative to Methane Generation”, L.G. Everett, Invited Presentation, San Francisco Airport, San Francisco, California, March 1999

“Methane Contamination at DOD Sites” L.G. Everett, Hydrocarbon National Test Site (HNTS) Advisory Committee Meeting, Port Hueneme, California, March 8, 1999

Invited peer reviewer, ASME, to review remediation programs, Institute for Regulatory Science, Columbia, Maryland, February 19, 1999

“Recent Developments of the Livermore Hydrocarbon Reports”, L.G. Everett, Society of American Military Engineers, Port Hueneme, California, November 10, 1998

“Groundwater Recirculation Well Technology Update”, Hydrocarbon National Test Site Advisory Committee, October 19, 1998, Amherst, Massachusetts

“Weaknesses and Limitations of Vadose Zone Monitoring and Characterization”, Vadose Zone Monitoring, Characterization and Barrier Technologies, Warsaw ‘98 Symposium, September, 1998, Warsaw

“DOE Site Specific Vadose Zone Issues”, Vadose Zone Workshop for Warsaw ’98 Symposium, September 14, 1998, Warsaw

Invited panel presentation, “Vadose Zone Characterization and Instrumentation Needs”, Warsaw ’98 Symposium, September 14, 1998, Warsaw

Invited panel presentation , “Monitoring Technologies for Deep Barrier Installations”, Warsaw ’98 Symposium. September 14, 1998, Warsaw

Member of the Editorial Board, Journal of Limnology and Oceanography, School of Oceanography, University of Washington, Seattle, Washington, June 5, 1998

Requested by Dr. James Clark, Chairman of the Board, Eckenselder Inc. and Chairman of the National Academy of Engineering Board on performance monitoring, to lead a tour of the Vadose Zone Monitoring Laboratory to the complete NAS Board on Performance Monitoring, April 28, 1998.

Invited member of Interagency DNAPL Consortium Technical Advisory Group, Cape Canaveral Florida, April 20-22 1998

Panel member with others, DoD LUFT Cleanup Demonstration Program, Association for the Environmental Health of Soils, March 9, 1998, Port Hueneme, California

Invited Member Arid Vadose Zone Alliance, DOE Hanford, INEEL, 1998

Marquis Publication Board, 1998-99

Ivan Johnson Outstanding Achievement Award, ASTM, June 1997

Green Thumb's Up Award, US Navy (highest civilian award), January, 1997, Director of Environmental Programs, US Navy

"The Lawrence Livermore Blue Ribbon Panel", L.G. Everett, U.S. National Academy of Sciences, Washington, D.C., December 1, 1997

"The Staggering Impacts of the Livermore Recommendations on Hydrocarbon Remediation in the Subsurface", L.G. Everett, UNOCAL, Los Angeles, November 5, 1997

"Environmental Litigation Issues" presented to the Port of Oakland, October 16, 1997, Oakland, California

Invited by the US Navy to make presentations before Rear Admiral Leonid Nikolkolaevic Ivanitski, August 8, 1997, Sea Coast, Port Hueneme, California 97

"Rationale and Precedent Supporting Relaxation of Clean-up Standards: Releases from Underground Storage Tank Systems in Ohio", L.G. Everett, Vadose Research, Inc., Chamber of Commerce, Canton, Ohio, July 11, 1997

"Lawrence Livermore National Laboratory Hydrocarbon Reports will Result in Multi-Billion Dollar Reduction in Insurance Remediation Costs" L.G. Everett, Davidovitz & Yaron, Baltimore, Maryland, June 17, 1997

"Lawrence Livermore National Laboratory Perspective on MTBE", L.G. Everett, "The MTBE Controversy" Continuing Education Courses, Sunnyvale, California, May 29, 1997

"The Staggering Impacts of the Livermore Recommendations on Hydrocarbon Remediation in the Subsurface", L.G. Everett, Civil and Environmental Engineering Department, USC invited presentation, Los Angeles, California, May 27, 1997

"Improving the LUST Cleanup Process", L.G. Everett, Milwaukee Athletic Club, April 29, 1997

"Regulatory and Technical Breakthroughs in Hydrologic Monitoring with special emphasis on Vadose Zone Hydrology", L.G. Everett, Ecological Seminar Series, UCLA invited presentation, March 25, 1997

Order of Electronic Weasels (Warfare Guided Missile), Liton Industries, October 30, 1996

Invited panel discussion, "The Changing Landscape of Groundwater Protection and Cleanup Policy", 5th Annual Meeting, Groundwater Resources Association, Multi Disciplinary Solutions to California Groundwater Issues, Windham Garden Hotel, Costa Mesa, California, October 10-11, 1996

"Impacts of Lawrence Livermore National Laboratory Reports", L.G. Everett, Port of Long Beach, Los Angeles, CA April 16, 1996

"Impacts of Lawrence Livermore National Laboratory Reports", L.G. Everett, Long Beach Redevelopment Agency Presentation, West Long Beach Project Committee Office, Long Beach, California, March 13, 1996

"Weakness in Vadose Zone Risk Estimations", L.G. Everett, International School of Innovative Strategies Applied to Environmental Cleanup in Central & Eastern Europe, invited paper, World Laboratory, Erice-Sicily, November 24, 1995

"The Vadose Zone: Recent Breakthroughs Impacting Regulatory Changes & Remediation Strategies", L.G. Everett, Coast Geological Society, Keynote Address, Ventura, CA, June 3, 1995

Invited Chairman of Blue Ribbon Peer Review Panel, United States Department of Energy, Idaho National Engineering Lab, Idaho Falls, Idaho.

Invited Advisory Committee Panel, United States Department of the Navy, National Test Site, Naval Facilities Engineering Command, Alexandria, Virginia, December 1993.

Conference Co-Chairman, First National UST Conference, United States Navy, Naval Civil Engineering Laboratory, Port Hueneme, California, May 1993.

Chairman, Lakehead University Annual Alumni Campaign Fund, Ontario, Canada, 1993.

Invited co-editor, UNESCO Global Warming Project, World Groundwater Flow Map, Moscow, Russian National Academy of Sciences, December 1992.

Invited opening paper on Field Screening for Environmental Pollutants, Massachusetts Institute of Technology, Cambridge, MA, October 26-27, 1992.

Invited presentation by Dr. Mordeckai Margaritz, President, Weizmann Institute of Science, Rehovot, Israel, Invited Presentation on Solute Transport Phenomena, September 29, 1992.

Invited by Commission of the European Communities, Joint Research Center, to present Innovative Monitoring Strategies, September 21-25, 1992, ISPRA (Varese), Italy.

Invited by the American Academy of Environmental Engineers to write monograph on Soil Washing/Soil Flushing, AAEE Headquarters, Cincinnati, OH, June 30, 1992.

Recipient of Standards Development Award, American Society for Testing and Materials, June 1992, Louisville, KY.

Invited Panel Member: Future of Environmental Cleanup in Developing Countries, International School of Innovative Technology for Cleaning the Environmental, Ettore, Majorana Center for Scientific Culture, Erice, Sicily, Italy, April 22-29, 1992.

Invited Presentation, the World Lab, International School for Innovative Technology for Cleaning the Environmental, April 22-29, 1992, Erice-Italy.

Session Chairman, Hazardous Materials Control Research Institute, National R&D Conference on Control of Hazardous Materials Soil Washing and Slurry Reactor Bioremediation, February 1992, Fairmont Hotel, San Francisco, California.

Invited seminar, University of Southern California, Environmental Engineering Program, February 28, 1992, Los Angeles, California.

Recipient of Standards Development Award, American Society for Testing and Materials, January, 1992, New Orleans Annual Society Meeting.

Invited Session Chairman, ETEX 91, (Environmental Technology Exposition and Conference on Physical Remediation Technologies, Sands Expo and Convention Center, Las Vegas, Nevada, March 13-15, 1991.

Invited presentation, peer review of research conducted by Subsurface Monitoring Branch, Environmental Monitoring Systems Laboratory, United States Environmental Protection Agency, Las Vegas, Nevada, February 25-27, 1991.

Invited Session Chairman on Vadose Zone Investigation Methods in Symposium on Groundwater and Vadose Zone Investigations, sponsored by ASTM, The Sheraton Harbor Island Hotel, San Diego, California, January 30 - February 1, 1991.

Invited co-chairman (with Russian colleague) of Remediation Session in First USA/USSR Joint Conference on Environmental Hydrology and Hydrogeology, American Institute of Hydrology, Leningrad, USSR, June 18-21, 1990.

Selected by the University of California to testify during Congressional hearings on the EPA Superfund, January 10, 1990

Invited state-of-the-art review by the National Academy of Sciences, "Underground Tank Leak Detection Methods: A State-of-the-Art Review of Vadose Zone Monitoring", L.G. Everett, Dec. 12, 1988, Washington, D.C.

Invited moderator for Vadose Zone Investigations held at the Focus Conference on Southwestern Groundwater Issues, American Association for the Advancement of Science, Albuquerque, New Mexico, March 23-25, 1988.

Invited keynote speaker, Soil and Water Conservation Society of America, "Hazardous Waste: A Challenge for Soil and Water Scientists", January 28, 1988, California Polytechnic State University, San Luis Obispo, California.

Invited chairman, symposium on Standards Development for Groundwater and Vadose Zone

Monitoring Investigations, ASTM, January 27-29, 1988, Albuquerque, New Mexico.

Invited Chairman on Use of Vadose Zone Monitoring Techniques in Groundwater Monitoring Investigations, Standards Development for Groundwater and Vadose Zone Monitoring Investigations, ASTM/USEPA, Mariott Center City, September 18, 1987 Minneapolis, Minnesota.

Invited member of expert panel overseeing the Midwest Research Institute Technical Support Contract for Underground Storage Tanks, May 1987-88.

Hazardous Waste Management and Groundwater Monitoring, presented to the Air Pollution Control Association, APCA Technical Meeting at the Hershey Corpus Christi Hotel, Corpus-Christi, Texas, April 23, 1987.

Course Lecturer for 25 seminars to be given throughout the United States in 1987, sponsored by the National Water Well Association.

Elected Chairman of ASTM National Task Force to write Vadose Zone Monitoring Standards, ASTM, Tampa, Florida, February 1987.

Invited Panel Member for EPA Technology Transfer Symposium on Construction of Monitoring Wells and Considerations for Collection of Groundwater Samples, UNLV, November 19, 1986.

Invited Panel Chairman by the California Department of Water Resources to review groundwater pollution detection techniques to be used in California over the next 25 years, San Diego, September 1985.

Invited Blue Ribbon Panel Member to oversee State of California Legislation to maintain integrity of state's water resources.

Requested by U.S. Navy, California Department of Water Resources, University of California, California Environmental Health Association, to present training course on vadose zone monitoring at hazardous waste sites.

Elected President and Chairman of the Board of a California Corporation representing 85 high-technology corporations.

Selected on a sole-source basis to develop and present to all 10 EPA regional headquarters a groundwater monitoring training course for hazardous waste sites.

Invited Chairman for Technical Session for First National Symposium on Vadose Zone Monitoring, NWWA, Las Vegas, December 1983.

Invited Chairman for Technical Session on Vadose Zone Monitoring Equipment at First National Symposium on Groundwater Monitoring Equipment, NWWA, November 1982.

Invited Paper for FWPCA Annual Meeting in Reno Nevada, September 1983.

Invited member, international committee for UNESCO 1983 world meeting on Technical Advance in the Control and Detection of Groundwater Pollution.

Advisor, U.S. National Center for Ground Water Research, 1982.

Invited Chairman for Workshop on Monitoring in the Vadose Zone, First National Groundwater Monitoring Symposium, Columbus, Ohio, 1981.

Invited moderator, "Workshop on Unsaturated Zone Monitoring," First National Groundwater Monitoring Symposium, NWWA, Columbus, Ohio, May 1981.

Invited by directors of peer-reviewed journal, Groundwater Monitoring Review, to develop charter series of papers on groundwater monitoring, March 1981.

Invited lecturer, University of California, Santa Barbara, Department of Mechanical and Environmental Engineering, 1980.

Charter President, California Section, American Water Resources Association, 1979.

Invited panel member for American Chemical Society meetings on water pollution regulations, Dallas, Texas, October 1979.

Invited by the Subcommittee on the Environment and the Atmosphere to give testimony before the U.S. House of Representatives on the draft bill titled, "Environmental Monitoring Management Act of 1978," on July 21, 1978.

Technical Program Chairman of "Establishment of Water Quality Monitoring Programs," 17th Annual AWRA Symposium, San Francisco, California, June 1978.

Invited key note speaker for General Electric's "think tank" at Town Meeting III entitled: "Technology and Tomorrow's Lifestyle", General Electric Company, Fairmont Hotel, San Francisco, California, March 8, 1978.

Invited chairman of "Environmental Impacts of Fossil and Nuclear Fuels," Fourth Annual American Chemical Society Conference, New Orleans, November 1977.

Invited chairman of "Water and Energy,"13th Annual American Water Resources Association Conference, Tucson, Arizona, October 1977.

Invited chapter written for the American Association for the Advancement of Science (AAAS) Manual on "Environment Systems", used in all U.S. Universities with Environmental Programs, 1974.

Who's Who in the West, 1976

Hubert D'Autrement Award,1971

AT&T Fellowship, 1968

Northern Engineering Award,1968

Atkinson Foundation Award, 1967

Lakehead University President's Medal, 1966

Honors (Peer Comments)

“I trust you immensely with my life and my water.” Neal Smithers, President, Access for Disabled Americans, 2010

This book “Submarine Groundwater” (English Editor/Co Author), provides the most advanced and up to dates methods and tools for the study and protection of coastal aquifers…. An indispensable reference and tool for the analysis of critical fresh water resources”. Journal of the American Water Resources Association, August 2005

“Thank you again for your incredibly valuable insights.” Basil Seggos, esq., Riverkeeper, Inc., New York, February 2005

“Produces more quality work than anybody that I have ever worked with.” Ed Alperin, Senior Vice President, Science and Technology, The Shaw Group, Jan. 2005

“We are especially gratified by the strong support of Dr Lorne Everett. He has been the key senior advisor for our National Environmental Technology Test Site”. Stephen E Eikenberry, Head Environmental Programs, NFESC US Navy. 2000

Dr. Everett, invited reviewer -“We have invited the best scientists and engineers in the country to help us assess the current program, and I look forward to your active participation and constructive criticism, Dr. Everett.” Dr. Dolores M. Etter, Deputy under Secretary of Defense, February 1, 1999

“Dr. Everett is known in many countries including Russia as an outstanding scientist in the field of hydrology and hydrogeology. His monographs and scientific papers are devoted…..They are widely used by Russian specialists in scientific practical works. Dr Everett’s name has wide authority over Russian scientists”. Dr Igor Zektser, Head of Hydrogeology, Russian Academy of Sciences, 1999

“Your innovation and contribution to technological development are recognized within the firm and around the world.” Richard E. Bartlett, P.E., Vice President, manager, Expert Services, Arcadis Geraghty & Miller, Inc. February, 1998

“Dr. Everett played a significant role, both personally and as part of the Hydrocarbon National Test Site advisory committee, in ensuring that our demonstration projects would result in complete and fully acceptable data that could transition into cost effective innovative technologies for the field” William A. Quade, Jr., Director of Environmental Programs, Naval Facilities Engineering Command, January 1997

“In short, he (Dr. Everett) is reputed to be the consummate expert in fuel contamination in the vadose zone and saturated zone of soils. Importantly, Dr. Everett is a primary author of the October 1995 “Recommendations to Improve the Cleanup Process of California’s Leaking Underground Fuel Tanks” report published by Lawrence Livermore National Laboratory and submitted to the California State Water Resources

Control board and the Senate Bill 1764 Leaking Underground Fuel Tank Advisory Committee." Board of Port Commissioners, Port of Oakland Executive Office recommendation, 1997

"The eleven other law firms involved in the litigation involving this matter have all consistently conceded that Dr. Everett's work provides as close to "bullet proof" analysis as can be reasonably contained in a case of this nature." J.R. DeLoretto, Attorney at Law, June 1997

"Dr. Everett brought a highly complicated site, involving commingled plumes to a swift and extremely beneficial (no action) closure and his forensic work resulted in a huge victory for my clients, and others as well, in an extremely significant matter"….Varga, Berger Ledsky and Hayes, Attorneys at Law, Chicago, July 1997

"EPA's consultants (Dr. Allen Freeze) were impressed with Hawker's consultants (Dr. Lorne Everett) and their analyses, and strongly advised the Enforcement team to settle with the hawker defendants." Maria M. Rongone, Assistant EPA Regional Counsel, December 1996

"Dr. Everett is the author of many useful and very important books. His name and his books are widely used throughout many countries, including the Soviet Union." Professor Igor S. Zekster, Head, Department of Hydrogeology, Academy of Sciences, U.S.S.R., September, 1991

"From the reactions and comments of people attending Dr. Everett's Vadose Zone Characterization course, it was a tremendous success. I would like to take this opportunity to express an endorsement for this course from Region II." Mr. Lawrence Rinaldo, Senior Hydrogeologist, U.S. Environmental Protection Agency, Region II, December, 1990

Subsurface Migration of Hazardous Wastes, authored by Everett et al, "is an excellent new text book which should be in everyone's hydrogeologic library,..." Groundwater Monitoring, Volume 27 #2 September, October 1989

Groundwater Monitoring, authored by Dr. Lorne G. Everett is a "reprint of a classic handbook which presents the first major methodology for designing monitoring programs for all sources of groundwater pollution," The American Institute of Hydrology, Vol. 7, No. 2, April 1989

"Thank you for your excellent teaching in our training course on Groundwater Quality." Bill Eichert, Director, The Hydrologic Engineering Center, Department of the Army Corps of Engineers.

American Association of Groundwater Scientists/Water Well Journal, May 1988, "heading the workshop will be the foremost expert on the subject of "vadose zone monitoring."

The Groundwater Newsletter/Geraghty & Miller, Inc., August 16, 1988, "the leading expert in the field, Dr. Lorne G. Everett, will share his considerable knowledge of instrumentation and state-of-the-art techniques for unsaturated zone investigations."

"The principal instructor for the course entitled 'Vadose Zone Monitoring and Sampling Techniques' is Dr. Lorne G. Everett, the leading expert in the field", The Association of Groundwater Scientists and Engineers, March 1988

"His reputation as an expert and prolific writer in this field has thrust him into a position of international prominence…" Jay H. Lehr, in his review "Groundwater Monitoring Handbook for Coal Oil Shale Development" March, 1986.

"We work closely with a nationally renowned expert on hazardous waste and groundwater monitoring, Dr. Lorne G. Everett. He has published numerous articles and texts on the subject and is currently active in developing U.S. EPA regulations for monitoring hazardous waste in the saturated and unsaturated zones." American Geotechnical National Offices.

Environmental Research Center, University of Nevada, Las Vegas, 1984, "...several excellent documents have been released in recent years that provide detailed and highly useable information on vadose zone sampler types (Everett, et al., 1982; Everett, et al. 1983). These sources are recommended as invaluable for field studies involving soil monitoring."

Colorado School of Mines Publications Department, April 1984, "the author (Dr. Everett) has written many of the classic manuals on monitoring methods."

Ground Water, December 1983, "Groundwater Monitoring is a 63-page contribution in the hydrology chapter, by Lorne G. Everett of Kaman Tempo in Santa Barbara, California, one of the top groundwater monitoring experts in the U.S."

Ground Water Monitoring Review, Spring 1981, Charter Series of Invited Papers by Dr. Everett "presented by one of the pioneers in the field of ground-water monitoring."

Chief Research Hydrologist, U.S. Environmental Protection Agency, October 1980, "(Dr. Everett's handbook) established the state-of-the-art used throughout the (hazardous waste) industry today."

Books Published

Submarine Groundwater, Zektser, I.S., Dzhamalov, R.G., L.G. Everett, English Editor, CRC Press, Boca Raton, FL, 2007. 428 pgs.

Conclusions, in Groundwater Resources of the World and their Use , Everett, L and I. Zektser, 2004, , HIP-VI, Series on Groundwater No. 6, UNESCO, Paris, 346 pgs.

Evaluation and Remediation of Low Permeability and Dual Porosity Environments, Everett, L. and M. Sara Editors, ASTM International, 2002, 186 pgs.

Groundwater and the Environment, Applications for the Global Community, Zektser, I. S., Chief Editor, L.G. Everett, English Editor, CRC Press, Boca Raton, FL, 2000. 175 pgs.

Liquid Extraction Technologies, Mann, M. J., Ayen, R.J., Everett, L. G., Gombert11,D., Mckee,C.R., Meckes,M., Traver, R. P., Walling,Jr, P.D., Way, S.C. American Academy of Environmental Engineers, Annapolis, MD, 1997

Vadose Zone Monitoring at RCRA, Subtitle C, Facilities (with S.J. Cullen). United States Environmental Protection Agency, Las Vegas, NV. 1996, 332 pages

Handbook of Vadose Zone Characterization and Monitoring, Wilson, L. G., Everett, L.G. and S.J. Cullen. CRC Press, Inc., 1995. 730 pages.

"Soil Washing/Soil Flushing Monograph" Mann, M.,J. Dahlstrom, D.,Esposito, P., Everett, L. G., Peterson, G., Traver, R.P., American Academy of Environmental Engineers, Cincinnati, OH, 1993

Innovative Technologies for Cleaning the Environment: Air, Water and Soil (with others), World Scientific 1060 Main Street, Suite 1B, River Edge, New Jersey 07661 (1993), 683 pages.

Innovative Site Remediation Technology, Soil Flushing/Soil Washing (with others), American Academy of Environmental Engineers, 130 Holiday Court, Suite 100, Annapolis, Maryland 21401, December (1993)

Subsurface Migration of Hazardous Waste (with others), Van Nostrand Reinhold, 115 5th Avenue, New York, New York, 10003 (1990), 387 pages.

Groundwater Monitoring Handbook for Coal and Oil Shale Development, Everett, L. G., Elsevier Publications, Amsterdam (1985), 303 pgs.

Vadose Zone Monitoring for Hazardous Waste Sites, Everett, L. G. Wilson, L. G. and E.W. Hoylman, Noyes Publications, (Nov. 1984) 358 pgs.

Groundwater Monitoring, Everett, L. G., Genium Publishing Corp., Schnectady, New York (August 1980) 440 pgs.

Establishment of Water Quality Monitoring Programs, Everett, L. G. and K.D. Schmidt, editors, American Water Resources Association 1979, 370 pgs.

Selected Publications, Reports and Presentations

“Highly Dynamic Subsurface Vapor Concentrations: Observations and Implications” M. Kram, P. Morris, L. Everett, C. Frescura, B. Kahl, and J. Showers. Mark L. Kram, Battelle Eighth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, May 21–24, 2012

“Dynamic Subsurface Explosive Vapor Concentrations: Observations and Implications”, M.L. Kram, P.M. Morris and L. G. Everett, Wiley Periodicals, Inc, wileyonlinelibrary.com, DOI:10.1002/rem.21299, 2011

Co-chaired with President A. Zichichi, Water and Pollution Focus, General Assembly session, Water Scarcity and Pollution, World Federation of Scientists,

International Seminars on Planetary Emergencies, the Role of Science in the 3rd Millennium, Erice, Italy, August 21, 2011.

Co-Chaired with Dr. C. Difiglio and President A. Zichichi, General Assembly Session, "Energy and Pollution, Focus: Unconventional Natural Gas…Benefits and Risks , World Federation of Scientists, International Seminars on Planetary Emergencies, the Role of Science in the 3rd Millennium. Erice, Italy, August 21, 2011.

Co-Chaired with Dr. S. Parmigiani and Dr. Fred vom Saal with President A. Zichichi, General Assembly session, Water and Pollution, Focus on Contaminants of Emerging Concern (CEC), World Federation of Scientists, International Seminars on Planetary Emergencies, the Role of Science in the 3rd Millennium. Erice, Italy, August 22, 2011.

Chaired the World Federation of Scientists Permanent Monitoring Panel Meeting, Enrico Fermi Lecture Hall, World Federation of Scientists, International Seminars on Planetary Emergencies, the Role of Science in the 3rd Millennium, Erice, Italy, August 19, 2011.

L. Everett, Defending Low Concentrations of Toxic Chemicals in Court, Water and Pollution Workshop entitled "Sources, Effects, and New Approaches to Contaminants of Emerging Concern, Enrico Fermi Lecture Hall, World Federation of Scientists, International Seminars on Planetary Emergencies, the Role of Science in the 3rd Millennium, Erice, Italy, August 24, 2011.

L. Everett, World Federation of Scientists Permanent Monitoring Panel Pollution Report to the General Assembly, World Federation of Scientists, International Seminars on Planetary Emergencies, the Role of Science in the 3rd Millennium. Erice, Italy, August 23, 2011.

"Resolving the Nuclear Waste Issue on the road to Sustainability", L.G. Everett and F. Parker, International Seminar on Nuclear War and Planetary Emergencies 40th Session; August 19-24, 2008, Centre for Scientific Culture, Erice, Italy

"Pollution PMP Annual Report", L.G. Everett, International Seminar on Nuclear War and Planetary Emergencies 40th Session; August 19-24, 2008, Centre for Scientific Culture, Erice, Italy

"Pollution Liability", L.G. Everett, P. Wielinski and G. Yaron, , Construction Defect Claims & Coverage Super Conference, Nov. 5, 2008, Las Vegas, NV

English Editor, monograph entitled "Groundwater Resources of the World and Their Use". Published by UNESCO in Paris. 2004

Co-edited new ASTM book entitled "Evaluation and Remediation of Low Permeability and Dual Porosity Environments". This state of the art book includes papers from international authors working on some of the most complex issues in hydrology. 2004

Study of Vadose Zone Monitoring at the Hanford Site, Task II, Potential Applications at the Central Plateau Remediation Project, U.S. Department of Energy, Richland Operations Office, Flour Hanford, 2003

Study of Vadose Zone Monitoring at the Hanford Site, Task1, Use in New Cells at the Environmental Restoration Disposal Facility, U.S. Department of Energy, Richland Operations Office, Flour Hanford, 2003

"DNAPL Characterization Methods and Approaches, Part 2: Cost Comparisons", Kram, M. , A. A. Keller, J. Rossabi and L. Everett, Groundwater Monitoring and Remediation, v.22, p.46-61 2002

"Science and Technology Monitoring Needs for Site Containment and Closure", L.G. Everett and Stephen J. Kowall, proceedings of SPECTRUM 2002, Reno, NV August, 2002

"Recent Technical and Regulatory Breakthroughs in Subsurface Contamination Investigations", The Frank L. Parker Distinguished Lecture Series, Vanderbilt University, February 25, 2001

"A National Roadmap for Vadose Zone Science and Technology", L.G. Everett, et.al., proceedings of Waste Management 2002, Tucson, AZ

"A 20 Year View of Vadose Zone Characterization, Monitoring and Modeling", American Institute of Hydrology, Bloomington, MN, October 16, 2001

“Principles and Operational Strategies for Repository Staging Systems”, National Academy of Sciences, Washington, D.C., September 6, 2001

"DNAPL Characterization Methods and Approaches Cost Comparisons", L.G. Everett, et. al., National Groundwater Association, Journal of Groundwater Monitoring and Remediation, Sept, 2001

Vadose Zone Science and Technology Roadmap: A National Program of Research and Development, Forum for Federal and State Environment Agencies, Tribes and US DOE Supporting Science Organizations, Seattle, WA, June 6, 2001

“Getting the Most from Your Expert Witness”, 2001 PBA Civil Litigation Section Retreat, Washington, D.C. April 19-22, 2001

“Recent Technical and Regulatory Breakthroughs”, Exchange 2001, Philadelphia, PA, March 29-31, 2001

"Long Term Institutional and Regulatory Policy Issues Related to the Vadose Zone", L.G. Everett, Waste Management '01 Conference, February 25-March 1, 2001, Tucson, AZ

“DNAPL Characterization Methods and Approaches, Part 1: Performance Comparisons”, Kram, M. , A. A. Keller, J. Rossabi and L. Everett, Groundwater Monitoring and Remediation, v.21, no. 4 p.109-123, 2001

"The DOE Complex-wide Vadose Zone Science and Technology Roadmap" L.G. Everett, et.al., proceedings of the Prague 2000 Fifth Symposium on Environmental Contamination, Prague, Czech Republic, October 2000.

"The Importance of Vapor Phase MTBE Releases", L.G. Everett and Aaron O'Brien, Conference on Petroleum Hydrocarbons and Organic Chemicals in Groundwater, NGWA, November 15-17, 2000, Anaheim, CA

"DOE Complex Wide Vadose Zone Science and Technology Roadmap; Characterization Modeling and Simulation of Subsurface Contaminant Fate and Transport", (with others), presented at the Special Panel Session of the Department of Energy Tie Conference, November 14-16, 2000, Augusta, GA

"DOE Complex Wide Vadose Zone Science and Technology Roadmap, Characterization Monitoring and Simulation of Subsurface Contamination Fate and Transport", (with others), United States Department of Energy, September, 2000.

“Recent Concerns with Methane Explosions Associated with Leaving Petroleum Hydrocarbons in Place”, Los Angeles County Bar Association, Los Angeles, CA, June 8, 2000

“A National Strategy for Vadose Zone Science and Technology, Understanding Complexities in Subsurface Environment and Closing the Circle for the Hydrologic Cycle”. S.J. Kowall, D.B. Stephens, D. Borings, D. Ellis, L. Everett, M. Th Van Genuchten, M. Graham, 2000

“DNAPL Characterization Methods and Approaches: Cost and Performance Comparisons”, Kram, M., A. A. Keller and L. Everett, in Treating Dense Non-Aqueous-Phase Liquids, Remediation of Chlorinated and Recalcitrant Compounds, GB. Wickramanayake, A.R. Gavaskar, and N. Gupta, eds., pp. 59-68, 2000

“Breakthrough Technology Applications to Emerging Groundwater Issues”, SERDP/ESTCP, Arlington, VA, December 2, 1999

"CVOC Historical Case Analysis Study", (with others), Lawrence Livermore National Laboratory, 1999 The San Francisco Regional Water Quality Control Board listed the CVOC study as among the major accomplishments in groundwater contamination hydrology in 1999.

"Groundwater Circulating Well Technology Assessment", L.G. Everett and Wade F. Allmon, Naval Research Laboratory, August 1999, Washington DC

"The Impact of Tidal Influence on Coastal Petroleum Remediation", L.G. Everett. et. al., United States Navy, Port Hueneme, CA, October 1999

"DNAPL Characterization Methods and Approaches Performance Comparisons", Performance between direct push and conventional drilling monitoring methods technical report, Project advisor, L.G. Everett, Naval Facilities Engineering Service Center, February 2001, Port Hueneme, CA

Technical Review of Partitioning Interwell Tracer Test (PITT) at Hanford, Groundwater/Vadose Zone Integration Project, Lorne G. Everett, et al, October, 2000

"Long Term Monitoring of Remediation Approaches in the Vadose Zone, Subsurface Remediation", Federal Remediation Technologies Roundtable, June 8-11, St. Louis, Missouri, 1999

Historical Case Analysis of Chlorinated Volatile Organic Compound Plumes-Peer Review Panel, (with others), April 30, 1999, ITRC, Trenton, New Jersey

"Recent Breakthrough Opportunities in Environmental and Civil Engineering". University of Southern California Environmental Engineering Seminar, March 26, 1999

"Methane Contamination at DOD Sites", L.G. Everett, Hydrocarbon National Test Site, March 8, 1999

"Worldwide Environmental Perspectives", National Engineers Week, Mandalay Beach, February 21-27, 1999

Summary of LLNL/UC LUFT Cleanup Recommendations, (with others), Proceedings of the 21st Biennial Ground Water Conference, University of California, Davis, January 1999

"National Environmental Technology Test Site (NETTS) Update", L.G. Everett, Petroleum Environmental Research Forum (PERF), Brea, California, December 2, 1998

"High Flux Beam Reactor-Vadose Zone Transport", report submitted to Brookhaven International Laboratory, Upham, NY, December 1998

"Air Permeability of Porous Materials under Controlled Laboratory Conditions", Lorne G. Everett, et al., Groundwater Volume 36, No. 4, July-August 1998

"Department of Defense Petroleum Hydrocarbon Cleanup Demonstration Program Final Report: Risk-Informed Decision Making at Petroleum Contaminated Sites", (with others), June 1998, Lawrence Livermore National Laboratory

"Risk-Based Assessment of Appropriate Fuel Hydrocarbon Cleanup Strategies for the Naval Exchange Gasoline Station Naval Construction Battalion Center Port Hueneme, California", Lorne G. Everett, et al., March 1998, Lawrence Livermore National Laboratory, UCRL-AR-DRAFT

"Risk-Based Assessment of Appropriate Fuel Hydrocarbon Cleanup Strategies for China Lake Naval Air Weapons Station Navy Exchange Gas Station Site", (with others), January 1998, Lawrence Livermore National Laboratory, UCRL-AR-129578

"Risk-Based Assessment of Appropriate Fuel Hydrocarbon Cleanup Strategies for Tank 325 Site at Nebo Annex Marine Corps Logistics Base Barstow, California", (with others), January 1998, Lawrence Livermore National Laboratory, UCRL-AR-129579

"Risk-Based Assessment of Appropriate Fuel Hydrocarbon Cleanup Strategies for Site 390, Marine Corps Air Station (MCAS) El Toro, California", (with others), January 1998, Lawrence Livermore National Laboratory, UCRL-AR-128220

Lawrence Livermore Hydrocarbon Reports-Catastrophic Implications that are Over Due, L.G. Everett and S.J. Cullen, American Institute of Hydrology - A Decade of Progress, Tampa, FL, November 1997

Risk Notes for Lawrence Livermore National Laboratory Reports, L.G. Everett, G & M Software, Newsletter, Volume 9 Winter 1997

"Summary of LLNL/UC LUFT Cleanup Reccomendations", L. G. Everett et al., Biannual Groundwater Conference, September 15-16, 1997, Sacramento, California

"Risk Based Corrective Action-Application to California LUFT Sites", L.G. Everett et al., Proceedings of the 21st Biannual Groundwater Conference, September 15-16, 1997, Sacramento, California

"Chemical Loading in the Unsaturated Zone, Future Burden to Groundwater quality", 21st Biannual Groundwater Conference, Groundwater and Future Supply, Sacramento, California, September 15-18, 1997

"Passive Remediation Finally Accepted", invited guest editorial, L.G. Everett and E.K. Nyer, The Journal for Environmental Restoration Professionals, Remediation Management, Third Quarter, Volume 3 No. 3, 1997

"Risk-Based Assessment of Appropriate Fuel Hydrocarbon Cleanup Strategies for the Naval Exchange Gasoline Station Naval Construction Battalion Center Port Hueneme, California", LG Everett, et al., June 1997, UCRL-AR-126774 DR

"Application of the Lawrence Livermore National Laboratory Reports to Fuel Hydrocarbon Cleanup Strategies in Ohio", Geraghty & Miller, Columbus, OH July 10, 1997

"Management Scales Eco System Research, Findings and Recommendations", LG Everett et al., The Center for the Study of the Environment, Airlie House Work Shop, June 1997

"Draft Final Assessment of Appropriate Fuel Hydrocarbon Cleanup Strategies for Vandenberg Air Force Base, California Using a Risk-Based Approach" (with others), March 1997, Lawrence Livermore National Laboratory UCRL-AR-126774 DR

"Response to USEPA Comments on the LLNL/UC LUFT Cleanup Recommendations and California Historical Case Analysis" (with others), January 1997, Lawrence Livermore National Laboratory, UCRL-AR-125912

"Assessment of Appropriate Fuel Hydrocarbon Cleanup Strategies for Travis Air Force Base, Fairfield, California using a Risk-Based Approach", (with others), March 1997, Lawrence Livermore National Laboratory, UCRL-AR-125941 DR

"Barrier Emplacement Quality Assurance and Monitoring Strategies", 1997 International Containment Technology Conference and Exhibition. St. Petersburg, Florida, February 9-12, 1997

"Assessment of Appropriate Fuel Hydrocarbon Risk-Management Strategies for George Air Force Base, Victorville, California Using a Risk-Based Approach", (with others), January 1997, Lawrence Livermore National Laboratory, UCRL-AR-125619

"Underground Storage Tank Remediation Exposed", invited guest editorial, L.G. Everett, The Journal for Environmental Restoration Professionals, Volume 2, No. 1, 1996.

"Underground Storage Tank Remediation Exposed", Remediation Management, January/February, 1996. (Editorial)

"California Leaking Underground Fuel Tank (LUFT) Historical Case Analyses" (with others) presented at the Sixth West Coast Conference on Soils and Groundwater, March 11-14, 1996. (Report)

"Recommendations to Improve the Cleanup Process for California's Leaking Underground Fuel Tanks (LUFTS)" (with others) presented at the Sixth West Coast Conference on Soils and Groundwater, March 11-14, 1996. (Report)

"Performance Monitoring and Evaluation" (with others) in Assessment of Barrier Containment Technologies, Ralph R. Rumer and James K. Mitchell, editors, product of the International Containment Technology Workshop, Baltimore, MD, August 29-31, 1995. (Article)

Carrington, Samantha, Crouch, Robert Carrington and Lorne G. Everett. A Cost Benefit Analyses of California's Leaking Underground Fuel Tanks. Science, (In review) 1996.

"Groundwater Resources of the Earth and Their Use" (with others). UNESCO International Hydrological Program Division of Water Resources 1,RUE Miollis 75732 Paris Cedex 15 France (book).

Intrinsic Bioremediation and Biosparging at Petroleum Hydrocarbon Impacted Sites, A National Model for Site Characterization, Monitoring and Closure Based on Findings of the Lawrence Livermore National Laboratory Report on Leaking Underground Fuel Tanks, Zackary, Scott T. and James Wells, Batelle Biannual International Insitu Bioremediation Symposium, New Orleans, December, 1996.

Laboratory Determination of Air Permeability in Four Common Soils Using a New Capillary Pressure Controlled Air Permeameter by David S. Springer, Hugo Loiaciga, S.J. Cullen, L.G. Everett. Water Resources Research, 1996 (in press).

An Evaluation of California's Leaking Underground Fuel Tank Cleanup Process, (with others), invited key note address, First International Conference on "The

Impact of Industry on Groundwater Resources" Cernobbio, Italy, May 23rd, 1996.

"Impact of Industry on Groundwater Resources" Cernobbio, Italy, May 23rd, 1996.

Wilson, L.G., Lorne G. Everett, and Stephen J. Cullen, editors, Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI, 1995

Cullen, Stephen J., J.H. Kramer, L.G. Everett, and L.A. Eccles, 1994 "Is Our Groundwater Monitoring Strategy Illogical?" *In* L.G. Wilson et al. (eds.) Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI, 1995

Cullen, Stephen J. and Lorne G. Everett, 1994, "Estimating the Storage Capacity of the Vadose Zone". *In* L.G. Wilson et al. (eds.) Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI, 1995

Springer, David S., Stephen J. Cullen, and L.G. Everett, 1994, "Laboratory Studies on Air Permeability. *In* L.G. Wilson et al. (eds.) Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI, 1995

Kramer, John H., Stephen J. Cullen, and L.G. Everett, 1994, "Vadose Zone Monitoring with the Neutron Moisture Probe". In L.G. Wilson et al. (eds.) Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI, 1995

Dorrance, D.W., L.G. Wilson, L.G. Everett, and Stephen J. Cullen, 1994, "A Compendium of Soil Samplers for the Vadose Zone". *In* L.G. Wilson et al. (eds.) Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI, 1995.

Wilson, L.G., D.W. Dorrance, L.G. Everett, and Stephen J. Cullen, 1994, "In Situ Pore Liquid Sampling in the Vadose Zone." In L.G. Wilson et al. (eds.) Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI, 1995

Review of Leaking Underground Fuel Tank Manual, UC Berkeley, March 10, 1995.

United States Navy, National Test Site Program, Port Hueneme, California, January 6, 1995.

Indirect Technique Monitoring Strategies for Cap Design, Westinghouse Hanford, United States Department of Energy, Richland, Washington, January 9, 1995.

Groundwater and Vadose Zone Monitoring, Chairman, ASTM, Phoenix, Arizona, January 23-25, 1995

Vadose Zone Monitoring for Chlorinated Hydrocarbons, Southern California Edison, Los Angeles, California, January 31, 1995.

Review of U.S. Navy National Test Site Program, Port Hueneme, California, February 2, 1995

Insitu Containment Strategies, United States Department of Energy, San Antonio, Texas, March 22, 1995.

Vadose Zone Monitoring and Engineering Applications, National Groundwater Association Outdoor Action Conference (lecture and outdoor presentation), May 2-4, 1995.

Review of Cone Penetrometer Technologies, United States Navy, National Test Site Program, Port Hueneme, May 6, 1995.

Recent Breakthrough Technologies in Hydrogeology induction paper to the Russian Academy of Sciences, Institute for Crustal Studies, University of California at Santa Barbara, Wednesday, June 7, 1995.

Groundwater and Vadose Zone Monitoring Task Chairman, ASTM, Denver, Colorado, June 19-21, 1995.

Exploring the Vadose Zone, Everett, L.G. International Groundwater Technology, 1995.

Editor, Professional Groundwater and Hazardous Wastes Science Series, Ann Arbor Press, Chelsea, Michigan, August 1995.

Co-editor, Remediation Management, The Journal for Environmental Restoration Professionals, Forester Communications, Inc., September 1995.

Soil Washing/Soil Flushing, Innovative Remediation Technology, American Academy of Environmental Engineers, M. Mann, Editor, 1995.

Vadose Zone Soil Pore Liquid Sampling Advantages and Disadvantages, United States Department of Energy, Fernald Site, Fernald, Ohio, January 17, 1995

Vadose Zone Investigation and VES Remediation, United States Department of Energy, Sept. 19th, 1995 Idaho Falls, Idaho.

Vadose Zone Insights to Support Contamination Litigation, California Hazardous Waste Association, Burbank, California, Sept. 27th 1995.

"Breakthroughs in Vadose Zone Characterization and Remediation", Remediation Management, September/October, 1995. (Article)

Characterization and Monitoring Recommendations for Radioactive Waste Disposal Cells, United States Department of Energy, Fernald, Ohio, October 2, 1995

Leaking Underground Storage Tank Manual Changes, Air and Waste Management Association, Bakersfield, California, Oct. 19, 1995.

Breakthroughs in Vadose Zone Monitoring and Remediation, Association for the Environmental Health of Soils, University of Massachusetts, Amherst, Massachusetts, October 23, 1995.

Technical Breakthroughs Related to Unsaturated Zone Transport, Invited Paper, Hazmat Annual Meeting, Long Beach, California, November 8, 1995.

Weaknesses in Vadose Zone Risk Estimations, Invited Paper, International School of Innovative Strategies Applied to Environmental Cleanup in Central and Eastern Europe, World Laboratory, Erice, Sicily, November 24, 1995.

The American Tissue Culture Collection Recommendations, George Mason University, Washington D.C., December 13, 1995.

Recommendations to Improve the Cleanup Process for California's Leaking Underground Fuel Tanks (LUFTs), (with others), Lawrence Livermore National Laboratory, report submitted to the California Water Resources Control Board, Oct. 16, 1995.

California Leaking Underground Fuel Tank (LUFT) Historical Case Analysis, (with others), Lawrence Livermore National Laboratory, report submitted to the California State Water Resources Control Board, Nov. 16, 1995.

"Horizontal Neutron Moisture Logging as a Vadose Zone Monitoring Strategy", with John H. Kramer and Stephn J. Cullen, Report to Sandia National Laboratory, July 1994. (Report)

Science Review for International Science Foundation, Executive Office, Washington, D.C. January 3, 1994.

New Directions in Vadose Zone Monitoring, presented to the California Water Resources Control Board, Sacramento, California, January 12, 1994

EPA Closures Based on Vadose Zone Migration Theory, presented to the Los Angeles Regional Water Quality Control Board, January 18, 1994

Vadose Zone Monitoring Techniques, presented to the Los Angeles County Public Works Program, hosted by Pat Provano, January 19, 1994.

Chaired ASTM meetings in San Francisco on groundwater and vadose zone monitoring methods, January 25, 1994.

Vadose Zone Remediation, United States Navy, Port Hueneme, January 27, 1994.

Recent Engineering Breakthroughs in Contaminant Soil Investigations, Invited Lecture, USC, School of Environmental Engineering, February 4, 1994.

Principles of Site Investigation and Remediation, UCLA invited paper, Engineering Department, February 5, 1994.

Migration Theory for Chlorinated Hydrocarbons, presentation to the Santa Ana Water Board, Irvine, California, February 21, 1994.

Vadose Zone Monitoring Strategies, Invited paper, Arizona Department of Environmental Quality, Phoenix, Arizona, February 23, 1994.

Indirect Monitoring Techniques Used in the Vadose Zone, presentation to the Arizona Public Services, Phoenix, Arizona, February 24, 1994.

Vadose Zone Monitoring Tools Used in Barrier Designs, Battele Northwest Labs, Richland, Washington, February 1, 1994.

"Application of Geographic Information Systems Technology to Analyze Natural Resources and

Groundwater Flow Near a Class I Hazardous Waste Disposal Site" (with R. A. Nisbet, D. B. Botkin). Groundwater Monitoring Review, American Association of Groundwater Scientists and Engineers. 1994

"Vadose Zone Investigations and Remediation", Environmental Education Enterprises, Salt Lake City, UT, October 26, 27, 1994. (Report)

"National Standard for Measuring Soil Moisture," ASTM Section D18.21.02. 1994 (Book Chapter)

"National Standard for Using Neutron Moderation in the Vadose Zone," ASTM Section D18.21.02. 1994 (Book Chapter)

"National Standard for Installing Suction Lysimeters in the Vadose Zone," ASTM Section D18.21.02. 1994 (Book Chapter)

"National Standard for Installing Pressure Vacuum Lysters in the Vadose Zone," ASTM Section D18.21.02. 1994 (Book Chapter)

"National Standard for Obtaining a Soil Gas Sample using an Auger in the Vadose Zone," ASTM Section D18.21.02. 1994 (Book Chapter)

"National Standard for Obtaining a Soil Gas Sample using a Hammer Probe.," ASTM Section D18.21.02. 1994 (Chapter)

"National Standard for Measuring Soil Moisture Flux in the Vadose Zone," ASTM Section D18.21.02. 1994 (Book Chapter)

Rocky Flats Solar Evaporation Ponds Phase I Remediation Program, “RCRA Closure Case Study” DOE, Denver, Colorado, March 24, 1994.

A Critical Review of Surfactant Use, AEHS, Long Beach, California, March 29, 1994.

Innovative Vadose Zone Monitoring and Closure Applications, Arizona Department of Environmental Quality, Phoenix, Arizona, April 29, 1994.

Vadose Zone Containment Migration Analysis - A Technical Argument in Favor of Passive Remedial Action presented to Texaco Environmental Services, Los Angeles, California, April 21, 1994.

Vadose Zone Monitoring Strategies, Geraghty & Miller Los Angeles, May 23, 1994.

Vadose Zone Monitoring Applications for Engineers, National Groundwater Association, Outdoor Action Conference, Minneapolis, Minnesota, May 24, 1994.

Chaired ASTM meetings in Montreal, Canada for task entitled: Groundwater and Vadose Zone Monitoring, June 21, 1994.

Vadose Zone Monitoring Breakthroughs, Central Coast Regional Water Quality Control Board, San Luis Obispo, July 7, 1994.

Large Scale Aquifer Pumping and Infiltration Tests, Chairman Peer Review, August 2-4, 1994, Idaho Falls, Idaho.

Principals of Site Remediation and Investigation, invited lecture UCLA, School of Engineering, August 27, 1994.

Vadose Zone Monitoring Principles and Strategies, Arizona Hydrological Society, Phoenix, Arizona, September 23, 1994.

Large Scale Aquifer Pumping and Infiltration Test, National Academy of Sciences Review, INEL, Idaho Falls, Idaho, October 19, 1994.

Underground Storage Tank Monitoring Strategies, Regional Water Quality Control Board, San Luis Obispo, November 23, 1994.

Passive Remediation Strategies in the Vadose Zone, Southern California Gas Company, Los Angeles, California, December 7, 1994.

Vadose Zone Migration Analysis, Southern California Gas Company, Los Angeles, February 22, 1994.

Forthcoming Changes to RCRA Monitoring Strategies, Sandia National Lab, Albuquerque, New Mexico, March 2, 1994.

Soil and Groundwater Remediation Strategies, invited lecture, UCLA, March 11, 1994.

Ogg, Randy T., Lorne G. Everett, and Stephen J. Cullen, 1994. “Rocky Flats Solar Evaporation Ponds: RCRA Hybrid-Closure Case Study”. *In* Hazardous Materials Control Resources Institute (eds.), Proceedings of the

Third Federal Environmental Restoration Conference, April 27-29 New Orleans, Louisiana.

Recent Engineering Breakthroughs in Contaminated Soil Investigations, University of Southern California, School of Engineering, Environmental Engineering Program, Civil Engineering Department, KAP210, 3620 South Vermont Avenue, University Park, Los Angeles, California 90089, February 4, 1994.

Impact of Subsurface Hydrogeology, Fuel Bioremediation Program, United States Navy, Naval Facilities Engineering Service Center, Port Hueneme, California, January 26, 1994.

Three-Phase Hydrocarbon Sampling in the Vadose Zone, State of California-California Environmental Protection Agency, State Water Resources Control Board, Division of Clean Water Programs, 2014 T Street, Suite 130, Sacramento, California 94240, January 12, 1994.

"In-Situ Active/Passive Bioreclamation of Vadose Zone Soils Contaminated with Gasoline and Waste Oil Using Soil Vapor Extraction/Bioventing", (with S. Zackery), The Second International Symposium on In-Situ and On-Site Bioreclamation, April 5-8, San Diego, California, 1993. (Article)

"Vadose Zone Monitoring" In Geotechnical Practice for Waste Disposal, David E. Daniel, ed, Chapman & Hall, 1993 pp. 651-675.

Soil and Groundwater Remediation, University of California, Los Angeles, Department of Engineering, Information Systems, and Technical Management, November 8, 1993.

Vadose Zone Monitoring to Support Remediation Strategies, California Regional Water Quality Control Board, Monterey Park, November 2, 1993.

Vadose Zone Monitoring and Passive Remediation, Regional Water Quality Control Board, San Francisco, California, October 22, 1993.

Hydrocarbon Stability/Passive Remediation, County of Santa Barbara, California Water Resource Control Board, Site Mitigation Program, Solvang, California, October 20, 1993.

Vadose Zone Investigations and Remediation, Environmental Education Enterprises, Inc., Seattle, Washington, October 5, 1993.

Vadose Zone Monitoring to Support Passive Remediation Strategies, California Groundwater Association, Santa Barbara Chapter, Goleta, California, September 22, 1993.

Passive Remediation Strategies, State of California Environmental Protection Agency, Department of Toxic Substances Control, 10151 Croiden Way, Suite 3, Sacramento, California, 95827, September 9, 1993.

Vadose Zone Monitoring and Early Detection Strategies, United Nations Environment Program on Groundwater Contamination, San Jose, Costa Rica, July 29, 1993.

Vadose Zone Monitoring and Remediation Techniques, California Groundwater Association, Concord Sheraton Hotel, June 30, 1993.

Vadose Zone Changes to the Resource Conservation and Reclamation Action, RCRA Seminar, University of Wisconsin, St. Louis, Missouri, June 11, 1993.

Introduction to Vadose Zone Technology, The National Groundwater Association, Seventh National Outdoor Action Conference, Las Vegas, Nevada, May 26, 1993.

Fundamentals of Groundwater Monitoring (with others), Arlington, Virginia, American Ecology, May 18, 1993.

Hybrid Landfill Closures and Post-Closure Monitoring, United States Department of Energy, EG&G, Denver, Colorado, May 11, 1993.

Innovative Vadose Zone Characterization Protocols and its Effect on Remediation Strategies. United States Environmental Protection Agency, Research Coordination and Technology Transfer Conference, Santa Barbara, California, May 4, 1993.

Post-Closure Vadose Zone Monitoring Strategy Using Neutron Logs, Everett, L.G., J.H. Kramer. The Solid Waste Association of North America (SWANA), Journal of Municipal Solid Waste Management, Silver Spring, Maryland, March 1993.

Indirect Soil Moisture Measurements Using Dialectric Sensors, Troxler Electronics Corporation, Raleigh Durham, North Carolina, March 23, 1993.

Hydro-Geo Chemical Transport and Monitoring of Contaminants in the Vadose Zone, Everett, L.G., In Soil and Groundwater Remediation, UCLA Engineering and Management Series, March 9, 1993.

Hydrocarbon Stability ARCO Corporation, Irvine, California, February 11, 1993.

Vadose Monitoring Instrumentation, The National Waterwell Association, Holiday Inn Golden Gate, 1900 Van Ness, San Francisco, California, January 6, 1993.

Vadose Zone Instrumentation Installation Procedures, National Groundwater Association, Outdoor Action Conference, Las Vegas, Nevada, 1993.

Permit Writer's Guidance Manual for Monitoring Unsaturated Regions of the Vadose Zone at RCRA, Subtitle C Facilities, Everett, L.G., S. Cullen, United States Environmental Protection Agency, Environmental Monitoring Systems Laboratory, Las Vegas, Nevada, 1993.

World Map of Hydrogeological Conditions and Groundwater Flow, Everett, L.G. (with others), International Hydrologic Program, Project by UNESCO, Hydro Science Press, 2145 Draper Avenue, No. 202, St. Paul, Minnesota 55113, 1993.

Soil Washing/Soil Flushing Monograph (with others), American Academy of Environmental Engineers, Cincinnati, Ohio, 1993.

"Ground Water Pollution: An International Perspective",(with I. Zekster and S. Cullen), in European Water Pollution Control, Vol. 2, No. 6, November 1992, the Netherlands.

"Review of Groundwater Quality Monitoring Network Design"(with others). In Journal of Hydraulic Engineering, Vol. 118, No. 1, January, 1992. (Article)

Groundwater Pollution: An International Perspective, Everett, L.G., I.S. Zektser, S.J. Cullen, European Water Pollution Control, Vol II, No. 6, Elsevier, Amsterdam, The Netherlands, 1992.

Solute Transport Measurement in the Vadose Zone, Everett, L.G., Field Screening for Environmental Pollutants: Defining User Instrumentation Needs, Massachusetts Institute of Technology, Cambridge, MA, October 26, 1992.

A Peer Review of the Hanford Site Permanent Isolation Surface Barrier Development Program, Everett, L.G., D.E. Daniel, G.N. Richardson, C.C. Reese, W.G. Spaulding, Prepared for the U.S. Department of Energy, Office of Environmental Restoration and Waste Management, WHC-MR-0392, Westinghouse Hanford Company, Richland, WA, September 1992.

Direct and Indirect Pore-Liquid Monitoring in the Vadose Zone, Everett, L.G., S.J. Cullen, and J.H. Kramer, Commission of the European Communities, Joint Research Center, Technologies for Environmental Cleanup: Soil and Groundwater, Secretariate Eurocourses, 1-21020 ISPRA (Varese) Italy, September 21-25, 1992.

Innovative Soil Sampling Protocols and Its Affect on Remediation Strategies, Everett, L.G., Technologies for Environmental Cleanup: Soil and Groundwater, Commission of the European Communities, Joint Research Center, Secretariat Eurocourses, 1-21020, ISPRA (Varese) Italy, September 21-25, 1992.

A peer-review of the Hanford Site Permanent Isolation Surface Barrier Development Program (with others), prepared for U.S. DOE, Office of Environmental Restoration and Waste Management, WHC-MR-0392, Westinghouse Hanford Company, Richland, WA, September 1992.

Vadose Zone Monitoring for DOE sites, Everett, L.G., EG&G Rocky Flats, DOE, Denver, October 14-15, 1992.

Standard Guide for Soil Gas Monitoring in the Vadose Zone, Everett, Lorne G., William L. Ullom, Stephen J. Cullen, Vadose Zone Monitoring Laboratory, Institute for Crustal Studies, University of California, Santa Barbara, CA, September 24, 1992.

Hydrocarbon Stability at Crude Oil Spill Sites, Everett, L.G., WSPA (Western States Petroleum Association), Glendale, CA, September 9, 1992.

Contaminant Transport and Monitoring in the Vadose Zone, Groundwater Protection Council, U.S. Grant Hotel, San Diego, CA, August 2-5, 1992

Theory and Application of Vadose Zone Monitoring, Characterization, and Remediation, Everett, L.G. and D. Kreamer, the Association of Groundwater Scientists and Engineers, Division of NGWA, Madison, WI, July 14-16, 1992.

Underground Storage Tank Training Manual, Everett, L.G. and T. Nelson, Los Angeles Fire Department, Los Angeles, California, June 1992.

Is Our Ground Water Monitoring Strategy Illogical?, Everett, Lorne G., Stephen J. Cullen, Lawrence A. Eccles, Ground Water Monitoring Review, Summer 1992.

Vadose Zone Monitoring with the Neutron Moisture Probe, Everett, Lorne G., John H. Kramer, Stephen J. Cullen, Ground Water Monitoring Review, Summer 1992.

Management in the Environmental Era, Everett, L.G., Chevron Corporation, Corporate Headquarters, Richmond, CA, May 27-29, 1992.

Innovative Vadose Zone Monitoring Techniques, Everett, L.G., S. Cullen, J. Kramer, National Association of Groundwater Scientists and Engineers, Las Vegas, Nevada, May 12-13, 1992.

"Neutron Moderation Applications to

Hydrocarbon Site/Risk Assessment, Monitoring and Remediation". International Seminar on Nuclear War and Planetary Emergencies, 14th Session, April 27, 1992. (Report)

Innovative Pore-Liquid Monitoring Strategies, Everett, L.G., In Innovative Technologies for Cleaning the Environment: Air, Water, and Soil, the World Lab International School for Innovative Technology, Erice-Trapani, Sicily, April 22-29, 1992.

Vadose Zone Monitoring Strategies for Lawrence Livermore National Lab, Everett, L.G. and S. Zachary, Livermore, California, April 14-15 1992.

Theory and Application of Vadose Zone Monitoring, Characterization, and Remediation, Everett, L.G. and D. Kreamer, the Association of Groundwater Scientists and Engineers, Division of NGWA, Boston, Massachusetts, April 7-9, 1992.

Limitations of Groundwater Pump and Treat, Everett, L.G., Goodyear Tire Company, Akron, OH, February 14, 1992.

Environmental Monitoring for Western Coal Operations, Everett, L.G., Pittsburg and Midway Mining Company, Denver, CO, January 21, 1992.

Groundwater Monitoring Network Design, Everett et al, invited paper, American Society of Civil Engineering, Journal of Hydraulic Engineering, Vol. 118, No. 1, January, 1992.

"Innovative Vadose Zone Monitoring Techniques", (with S.J. Cullen and J. Kramer), National Association of Groundwater Scientists and Engineers, Las Vegas, Nevada, May 13-16, 1991.

Passive Remediation Strategies for Petroleum Contaminated Sites, L.G. Everett, S.J. Cullen, and L.A. Eccles, The Hazardous Materials Control Research Institute, Northeast Conference, Boston, Massachusetts, July 10-12, 1991.

A Comparison of Three Functional Forms for Representing Soil Moisture Characteristics, A.C. Bumb, C.L. Murphy, L.G. Everett, Groundwater, National Water Well Association, Spring, 1991.

Passive Remediation Strategies for Petroleum Contaminated Sites, Everett, L.G., Technology Transfer Conference on Environmental Cleanup, Technology Advancement Committee of the Society of American Military Engineers, Denver, CO, November 13-15, 1991.

Innovative Vadose Zone Monitoring at a Landfill Using the Neutron Probe, Everett, L.G., J.H. Kramer and S.J. Cullen, in Proceedings of the Fifth National Outdoor Action Conference on Aquifer Restoration, Groundwater Monitoring and Geophysical Methods, National Water Well Association, Dublin, Ohio, 1991.

Technical Guidance Summary, City of Los Angeles Fire Department Underground Storage Tank Program, May 1991

"Effects of Well Construction Materials on Neutron Probe Readings with Implications for Vadose Zone Monitoring Strategies" (with J. H. Kramer, L.A. Eccles). Fourth National Outdoor Action Conference on Aquifer Restoration, Ground Water Monitoring and Geophysical Methods, Las Vegas, Nevada, May 14-17, 1990.

Underground Storage Tank Leak Detection Problems, State Water Quality Control Board, Working Together for a Cleaner Environment, September 7, 1990.

"Contamination Investigations Using Neutron Moderation in Grouted Holes- A New Cost-effective Technique" (with J. H. Kramer, L. A.Eccles, D. Blakely). In Minimizing Risk to the Hydrologic Environment, Alexander Zaporozec, Ed., Kendall/Hunt Publishing Co, 1990 pp. 234-242.

"Evaluation of the Draft Consent Decree-Phoenix Goodyear Airport", Goodyear Tire and Rubber Company, Akron, OH, December 18,1990.

"Hydrogeologic Considerations Relevant to Monitoring Underground Storage Tanks in the Vadose Zone" (with S. J. Cullen, J. H. Kramer). EPA Invited Tank Issue paper, Advanced Systems Monitoring Laboratory, EPA, Las Vegas, Nevada, November 16, 1990.

Contamination Investigations Using Neutron Moderation in Grouted Holes: A Cost Effective Technique, Everett, L.G., J.K. Kramer, L.A. Eccles, D.A. Blakely, in Minimizing Risk to the Hydrologic Environment, Alexander Zporozec, Editor, Kendoll/Hunt Publishing Company, Dubuque, Iowa, pages 234-242, 1990.

Neutron Moderation Applications to Hydrocarbon Site Risk Assessment, Monitoring, and Remediation, Everett, L.G., L.A. Eccles, and D.A. Blakely, presented at the First US/USSR Conference on Environmental Hydrology, Leningrad, USSR, June 18-21 1990.

Proactive Post-Closure Vadose Zone Monitoring Strategy Using Neutron Logs, J.H. Kramer and L.G. Everett, GRCDA's 20th Annual Western Regional Solid Waste Management Symposium, Ontario, California, April 24-26, 1990.

Compendium of In Situ Pore-Liquid Samplers for Vadose Zone, with D. Dorrance, L. Wilson and S. Cullen, ACS Symposium Series, April 1990

Fate, Transport, and Measurement of Contaminants in the Vadose Zone, Everett, L.G., In International School for Innovative Cleanup of Contaminated Soils and Groundwater, World Laboratory, Erice-Trapani, Sicily, Italy, October 8-15, 1990.

Underground Storage Tank (UST) Leak Detection: External Instrument Options, S.J. Cullen, J.H. Kramer, and L.G. Everett, EPA invited tank issue paper, Advanced Systems Monitoring Laboratory, EPA, Las Vegas Nevada, November 16, 1990.

Criteria for Selecting Monitoring Devices and Indicator Parameters for Direct Pore-Liquid Sampling of Petroleum Hydrocarbon Contaminated Sites, L.G. Everett, S.J. Cullen, R.G. Fessler, B.W. Dorrence, L.G. Wilson, Office of Research and Development, United States Protection Agency, Cincinnati, Ohio, December 1990.

"Laboratory Demonstration of Hydrocarbon Migration in the Unsaturated Zone: Effectiveness of the U-Tube Design for Underground Storage Tank Leak Detection Monitoring", Everett, L.G., et. al, Groundwater Monitoring Review, Fall 1989.

"Effects of Access Tube Material and Grout on Neutron Probe Measurements in the Vadose Zone", Everett, L.G., et. al, Water Well Journal, Fall 1989.

“Application of Neutron Moderation/Field GC in Hydrocarbon Monitoring and Remediation” L.G. Everett, L. Eccles and D. Blakley, Environmental Research Conference, May 2-4, 1989, Washington D.C.

"Vadose (Unsaturated) Zone Monitoring Techniques For Underground Storage Tanks and Landfills and Recent Advances and Future Trends," The Association of Engineering Geologists, Montebellow, California, April 11, 1989.

Vadose Zone Monitoring and Sampling at Hazardous Waste Sites in the Western United States, Invited Paper, "Toxics in the Environment: Management Options and Solutions", L.G. Everett, 1988 Annual Conference of

National Association of Environmental Professionals, Orlando, Florida, April 19-22, 1988.

"The Future of Mono Lake", L.G. Everett, et al., Report of the Community and Organizational Research Institute, "Blue Ribbon Panel" for the Legislature of the State of California, University of California, Report No. 68, Water Resources Center, Riverside, California, 1988.

“Vadose Zone Investigations”, Conference of Southwestern Groundwater Issues, Albuquerque, NM, March 24, 1988

"Vadose Zone Monitoring and Sampling Techniques", L.G. Everett, the Association of Groundwater Scientists and Engineers, Short Course, February 9-11, 1988, Denver, Colorado.

“Vadose Zone Monitoring”, 67th Annual Meeting, Transportation Research Board, Washington D.C., January 11-14th, 1988

"Vadose Zone Monitoring Demonstration for Chemical Waste Management, Inc.," L.G. Everett, B.R. Keller, and A.M. Gurevich, ASTM Symposium on Standards Development for Groundwater and Vadose Zone Monitoring Investigations, January 27-29, 1988, Albuquerque, New Mexico.

"Vadose Zone Monitoring for Underground Storage Tanks", L.G. Everett, California Water Resources Control Board, San Diego, California, December 16, 1987.

"Vadose Zone Monitoring Considerations for Solid Waste Water Quality Assessment Tests (SWATs)", in the 3rd Annual Hazardous Materials Management Conference/West, Long Beach, California, December 2, 1987.

"The Status of Standards in Vadose Zone Monitoring", L.G. Everett, Workshop Session 3, Workshop on Standards Development for Groundwater and Vadose Zone Monitoring Investigations", ASTM/Association of Groundwater Scientists and Engineers, Minneapolis, Minnesota, September 18, 1987.

"Sources and Fates of Toxics in the Environment, L.G. Everett, HAZMAT, University of California at Santa Barbara, Fall 1987.

"Hazardous Waste Site Assessment and Mitigation Through Vadose Zone Monitoring", L.G. Everett, Association of Hazardous Materials Professionals, University of California at San Diego, July 30, 1987.

"Vadose Zone Processes and Monitoring", L.G. Everett, Association of Engineering Geologists, California State University, May 1987.

“Expert Panel on Leak Detection”, L.G. Everett, Policy and Standards Division, Office of Underground Storage Tanks, EPA, July, 1987

"Advantages of In-Situ Monitoring at Hazardous Waste Sites with Fiber Optics", L.G. Everett, invited EPA Headquarters paper, Atlanta, Georgia, April 1987.

"Vadose Zone Monitoring for Closure of Hazardous Waste Sites", L.G. Everett. Invited Paper, Texas Water Commission, Corpus Christie, Texas, April 23, 1987.

"Permit Guidance Manual on Unsaturated Zone Monitoring for Hazardous Waste Land Treatment Units", L.G. Everett, (EPA/530-SW-86-040), U.S. EPA, 1986.

"Lysimeter Comparison Tests at Hazardous Waste Sites," L.G. Everett, U.S. EPA Groundwater and Subsurface Monitoring Technology Transfer Symposium, University of Nevada at Las Vegas, November 18-20, 1986.

"Suction Lysimeter Operation at Hazardous Waste Sites, with L.G. McMillion, L.S. Eccles, ASTM Standards Symposium, Cocoa Beach, Forida, 1986.

"Processes Affecting Subsurface of Leaking Underground Tank Fluids" (with others), Environmental Monitoring Systems Laboratory, Office of Research and Development, EPA, Las Vegas, Nevada, January, 1986.

"National Permit Guidance Manual on Unsaturated Zone Monitoring for Hazardous Waste Land Treatment Units," U.S. EPA(EPA/530-SW-86-040), Office of Solid Waste and Emergency Response, Washington, D.C. 20460, 1986. (Report)

"Lysimeter Testing Program for Hazardous Waste Land Treatment" (with L.G. McMillion), EPA, Las Vegas, Nevada, January 1985.

Groundwater Monitoring of Oil Shale Development (with others), Elsevier Publications, Amsterdam (1985).

Groundwater Monitoring of Coal Strip Mining, Elsevier Publications, Amsterdam (1985).

"Unsaturated Zone Monitoring at Hazardous Waste Land Treatment Units" (with L.G. Wilson), National EPA Guidance Document, OSW, EPA, Washington, D.C., November 1984.

"Soil-Gas Monitoring Methods," EPA, Las Vegas, Nevada, October 1984.

Vadose Zone Monitoring Workshop, California Environmental Health Association, Bakersfield, CA November 30, 1984

"Constraints and Categories of Vadose Zone Monitoring Devices" (with E.W. Hoylman, L.G. Wilson, L.G. McMillion), Ground Water Monitoring Review, Winter, 1984.

Vadose Zone Monitoring for Hazardous Waste Sites (with others), Noyes Publications, (November 1984).

"Unsaturated Zone Monitoring Protocols for Hazardous Waste Land Treatment Units" (with L.G. Wilson, L.G. McMillion) in Characterization, and Monitoring of the Vadose (Unsaturated) Zone, NWWA, December 1983.

"Vadose Zone Monitoring at Hazardous Waste Sites," WPCF, Reno, Nevada, September 1983.

"Groundwater Quality Monitoring Recommendations for In Situ Oil Shale Development" (with K.E. Kelly, E.W. Hoylman), U.S. Environmental Protection Agency, EPA-600/4-83-045, Las Vegas, Nevada, September 1983.

"Vadose Zone Monitoring at Hazardous Waste Sites," Annual Conference FWPCA, Reno, Nevada, September 1983.

A Prototype Computer Interactive Groundwater Monitoring Methodology, U.S. Environmental Protection Agency, EPA 600/4-83-017, June 1983.

"Vadose Zone Monitoring Concepts at Landfills, Impoundments and Land Treatment Disposal Areas" (with L.G. McMillion and L.G. Wilson), National Conference on Confinement of Uncontrolled Hazardous Waste Sites, Washington, D.C., December 1982.

"Groundwater Quality Monitoring Recommendations for Western Surface Coal Mines," U.S. Protection Agency -- Las Vegas, Nevada, September 1982.

"Vadose Zone Monitoring Manual" (with E.W. Hoylman and L.G. Wilson), Environmental Protection Agency -- Las Vegas, Nevada, August 1982.

"Sampling Techniques for Unsaturated Zone Monitoring" (with E.W. Hoylman), invited paper Practical Groundwater Monitoring Considerations for the Mining Industry" NWWA, July 1982.

"Evaluation of Groundwater Pumping and Bailing Methods -- Application in the Oil Shale Industry" (with G.C. Slawson, Jr., K.E. Kelly), Groundwater Monitoring Review, Summer, 1982.

"Vadose Zone Monitoring Applications for Hazardous Waste Sites" (with L.G. McMillion), American Society of Civil Engineers, April 1982.

"A Computer Interactive Groundwater Monitoring Methodology: A Prototype for Holding and Waste Disposal Ponds" (with W.O. Rasmussen), Groundwater Monitoring Review Journal, Spring 1982.

“Hazardous Waste Disposal: Past Failures and Future Options”, UCSB Arts & Lectures and the Environmental Studies Program, April 29, 1982

Invited member International Program for Chemical Safety , Global Aspects of Groundwater Pollution, World Health Organization, 1982

"Vadose Zone Monitoring Concepts for Hazardous Waste Sites" (with L.G. Wilson and L.G. McMillion), Groundwater Journal, October 1981.

"Monitoring in the Unsaturated Zone," invited paper, Groundwater Monitoring Review Journal, June 1981.

"Monitoring in the Saturated Zone," charter paper, Groundwater Monitoring Review Journal, March 1981.

"A Structured Groundwater Quality Monitoring Methodology for Developing Countries," invited paper, World Health Organization, Collaborating Center on Surface and Groundwater Quality, Water Quality Bulletin, Vol. 6, No. 1, January 1981.

"A Computer Assisted Approach for Developing Groundwater Quality Monitoring Programs" (with R.M.

Tinlin, W.O. Rasmussen, and L.G. McMillion), NWWA Annual Meeting, Las Vegas, Nevada, October 1980.

"Monitoring and Management of Groundwater for Coal Strip Mines" (with L.G. McMillion), invited paper, Mining and the Environment in the 80's, University of Utah, Department of Mining & Fuels Engineering, September 1980.

Groundwater Quality Monitoring of Western Coal Strip Mining: Preliminary Designs for Active Mine Sources of Pollution (with E.W. Hoylman, editors), EPA-600/7-80-110, U.S. Environmental Protection Agency, June 1980.

Groundwater Quality Monitoring Designs for Municipal Pollution Sources: Preliminary Designs for Coal Strip Mine Impact Assessments (with M.A. Hulburt, editors), EPA-600/ 7-80-090, U.S. Environmental Protection Agency, May 1980.

Groundwater Monitoring, Genium Publishing Corp., Schnectady, New York (August 1980).

Establishment of Water Quality Monitoring Programs (with K.D. Schmidt), American Water Resources Association (January 1980).

"The Expanded Role of the Chemist in Coal, Oil Shale, and Hazardous Waste Monitoring," invited paper American Chemical Society Meetings, Dallas, Texas, October 1979.

"Strip Mining of Coal: Water Resource Issues," Canadian Water Resources Journal, vol 4, no. 1, ISSN 0701-1784, Winter 1979.

"Groundwater Quality Monitoring of Western Coal Strip Mines: Monitoring Guidelines for Potential Sources of Pollution" (with L.G. McMillion), presented at the American Water Resources Association Symposium, Las Vegas, Nevada, September 1979.

Groundwater Quality Monitoring of Western Coal Strip Mining: Identification and Priority Ranking of Potential Pollution Sources (Editor), EPA-600/7-79-024, U.S. Environmental Protection Agency, January 1979.

"The Ecological Impact of Land Restoration and Cleanup", Technology Assessment Division, Office of Radiation Programs, U.S. Environmental Protection Agency, Washington, D.C., EPA 520/3-78-006, 1978.

"Testimony of Dr. Lorne G. Everett at Hearings before the Subcommittee on the Environment and the Atmosphere on the Draft Bill titled, 'Environmental Monitoring Management Act of 1978,' before the U.S. House of Representatives, 95th Congress, 2nd Session, July 21, 1978," General Electric CompanyÄTEMPO Paper P-799, July 1978.

"Strip Mining of Coal: Water Resource Issues," invited paper presented at Canadian Water Resources Association Annual Convention, Winnipeg, Canada, June 28-30, 1978.

"Establishment of Groundwater Quality Monitoring Programs" (with R.M. Tinlin), paper presented at American Water Resources Association Symposium, San Francisco, California, June 12-14, 1978.

“Emerging Energy Technologies”, Commonwealth Club of California, San Francisco, CA, May 22, 1978

"Management of Ground-Water Quality Data" (with N.F. Hampton), paper P-787, Journal of Environmental Systems, vol 8, no. 4, 1978-1979.

"Groundwater Monitoring in the Powder River Basin," presented at Wyoming Water Resources Conference, University of Wyoming, January 1978.

Groundwater Quality Monitoring: 208 Planning Effort, prepared for EPA 208 Management and Implementation Short Course, Denver, Colorado, April 1977.

“Water and Energy”, Presented at the AWRA Water Resources Conference, Tucson, AZ, November 1, 1977

"Applications of Stochastic Methods in Eutrophication," Environmental Systems, Vol. 6, No. 4, 1976-1977.

"Desalting as a Potential User of Wind Energy," appendix to Wind Energy Mission Analysis, U.S. Energy Research and Development Administration, Pennsylvania, 1976.

Monitoring Groundwater Quality: Illustrative Examples (R.M. Tinlin, editor), EPA-600/4-76-036, U.S. Environmental Protection Agency, Monitoring and Support Laboratory, Las Vegas, Nevada, July 1976.

"Plankton Transect Analysis as an Indicator of Pollution Levels" (with R.D. Staker and R.W. Hoshaw), The American Midland Naturalist, June 1976.

Monitoring Groundwater Quality: Monitoring Methodology (with D.K. Todd, R.M. Tinlin, and K.D. Schmidt), EPA-600/4-76-026, U.S. Environmental Protection Agency, June 1976.

Monitoring Groundwater Quality: Methods and Costs (with K.D. Schmidt, R.M. Tinlin, and D.K. Todd), EPA-600/4-76-023, U.S. Environmental Protection Agency, May 1976.

"A Groundwater Quality Monitoring Methodology," invited paper National 208 Conference on Planning and Implementation, U.S. Environmental Protection Agency, Denver Colorado, April 1976.

"Groundwater Quality Monitoring Strategy" (with R.M. Tinlin), Paper P-728, Conference on Groundwater Quality -- Measurement, Prediction and Protection, Water Research Centre, Medmenham Laboratory, Reading University, England, September 1976; Santa Barbara, California, April 1976.

"A Methodology for Monitoring Groundwater Quality Degradation from Man's Activities" (abstract, with D.K. Todd and R.M. Tinlin), presented by R.M. Tinlin at the Spring Annual Meeting, American Geophysical Union, Washington, D.C., April 12-15, 1976; abstract appeared in EOS, Translations, American Physical Union, Vol. 57, No. 4, p. 246, April 1976.

"A Groundwater Quality Monitoring Methodology" (with K.D. Schmidt,D.K. Todd, and R.M. Tinlin), submitted to Journal American Water Works Association, General Electric Company ÄTEMPO Paper P-722, March 1976.

"Segmented Population Model of Primary Productivity" (with G.C. Slawson, Jr.), Journal of Environmental Engineering Division, American Society of Civil Engineers, vol 102, no. EE1, Proceedings Paper 11945, pp. 127-138, February 1976.

"Development of a Methodology for Monitoring Groundwater Quality" (with D.K. Todd et al.), International Conference on Environmental Sensing and Assessment, World Health Organization, Las Vegas, Nevada, 14-19 September 1975.

Analysis of Groundwater Recharged with Secondary Sewage Effluent, U.S. Department of Agriculture, Water Conservation Laboratory, Phoenix, Arizona, June 1975.

"Applications of Optimal Control to the Modeling and Management of Ecosystems (with T.L. Vincent et al.), Simulation, vol 24, no. 3, pp. 65-72, March 1975.

"Water Quality Properties in Recreation Management" (with G.C. Slawson, Jr.), Plateau, Northern Arizona Society of Science and Art, Inc., Spring 1975.

"Phytoplankton Distribution and Water Quality Indices for Lake Mead (Colorado River)" (with R.W. Hoshaw and R.D. Staker), Journal of Psychology, vol 10, pp. 323-331, 1974.

Assessment of Biostimulation and Eutrophication of Reclaimed Waste Water (with R.G. Gilbert and J.B. Miller), U.S. Water Conservation Laboratory Agricultural Research Service, U.S. Department of Agriculture, Phoenix, Arizona, 1974.

"Modeling and Management of Ecosystems via Optimal Control Theory" (with T.L. Vincent), 1st International Congress of Ecology, The Hague, The Netherlands, September 1974.

Public Health Characterization and Waste Load Allocation for the Parker Strip (with H.K. Qashu and S. Ince), Arizona State Department of Public Health, Phoenix, Arizona, June 1974.

"Eutrophication--A Stochastic Theoretic Model," Journal of the American Water Resources Association, May 1974.

"The Effect of Development on Groundwater in the Parker Strip" (with T.R. Schultz), American Water Resources Association, March 1974.

"Applicability of Remote Sensing to River Basin Control Programs" (with L.S. Leonhart), Third Annual Remote Sensing of Earth Resources Conference, The University of Tennessee Space Institute, Tullahoma, Tennessee, March 25, 1974.

Effects on Development of "Salinity" and Limnology of the Lower Colorado River (with D.D. Evans et al.), Office of Water Resources Research, Washington, D.C., 1973.

"Water Quality Monitoring of Reservoirs on the Colorado River from Lake Powell to the Gulf of California Utilizing ERTS-1 Imagery" (with K.E. Foster and L.K. Lepley), Remote Sensing and Water Resources Management, American Water Resources Association, Urbana, Illinois, 1973.

"Analysis in Eutrophication Modeling," Journal of the American Society of Civil Engineers, Sanitary Engineering Division, November 1973.

"An Evaluation of ERTS-1 Imagery in Reservoir Dynamics" (with L.S. Leonhart), Fourth Annual Conference on Remote Sensing of Arid Lands Resources and Environment, Office of Arid Lands Studies, University of Arizona, Tucson, November 14-16, 1973.

"An Outbreak of Shigella sonnei on Colorado River Raft Trips" (with M.H. Merson et al.), American Journal of Epidemiology, September 1973.

"Chemical and Biological Patterns in the Lower Colorado River System" (with J.S. Carlson and H.K Qashu), Arizona Academy of Science, Vol. 8, June 1973.

"Public Satisfaction in Water Resources Planning and Evaluation" (with R.M. Judge), Second Annual National Symposium on Societal Problems of Water Resources, American Water Resources Association, Chicago, Illinois, April 18, 1973.

"Chemical and Biological Problems in the Grand Canyon" (with G.C. Slawson, Jr.), Arizona Academy of Science, January 1973.

A Mathematical Model of Primary Productivity and Limnological Patterns in Lake Mead, Arizona, Natural Resource Systems Technical Report #13, University of Arizona, Tucson, 1972.

Public Health Problems in the Grand Canyon (with G.C. Slawson, Jr.), National Park Service, U.S. Department of the Interior, Grand Canyon, August 1972.

"Salinity--A Non-Specific Index of Water Quality," Proceedings, Seventh Session, On the Matter of Pollution of the Interstate Waters of the Colorado River and Its Tributaries, U.S. Environmental Protection Agency, February 1972.

A Chemical and Biological Study of the Colorado River--Grand Canyon Section, Part II (with H.K. Qashu and R.D. Staker), U.S. Department of the Interior, National Park Service, Grand Canyon National Park, October 1971.

Micronutrients and Biological Patterns in Lake Mead (with J.S. Carlson and H.K. Qashu), U.S. Department of the Interior, Bureau of Reclamation, September 1971.

A Chemical and Biological Study of the Colorado River--Grand Canyon Section (with J.S. Carlson, R.D. Staker, and H.K. Qashu), U.S. Department of the Interior, National Park Services, Grand Canyon National Park, July 1971.

A Conceptual Draft of a Dynamic Hydrobiological Model for Lake Mead, U.S. Department of the Interior, Bureau of Reclamation, Region 3, Boulder City, Nevada, April 1971.

"The Lower Colorado, A Dying River" (with J.S. Carlson and H.K. Qashu), Proceedings, Fourteenth Annual Meeting, Arizona Academy of Science, Vol. 6, 1970.

The Phosphorus Controversy, U.S. Department of the Interior, Bureau of Reclamation, Region 3, Boulder City, Nevada, November 1970.

DR. LORNE G. EVERETT
President/CEO
L. Everett & Associates, LLC.
3700 State Street, Suite 350
Santa Barbara, CA 93105
Phone: (805) 880-9300
e-mail: leverett@everettassociates.net
www.everettassociates.net

Expert Witness

DEPOSITIONS, TRIAL APPEARANCES & LITIGATION SUPPORT
For
Dr. Lorne G. Everett

1983	University of Texas vs. Texaco Incorporated D
1988	Foothill Triangle Partners vs. Mobile Oil Corporation D
1990	St. Vincent De Paul vs. California Linen T/D
1992	State of California vs. Hyatt Corporation
1993	U.S.A & State of California on behalf of TSC vs Allied-Signal, Incorporated, California Car Hikers Services, Hawker Pacific, Inc.
1993-94	Cigna Insurance Co. vs. Talley Corporation
1993-96	Harz vs. Zell
1994-95	Western Bank vs. Great Lakes Chemical Company D
1994-95	Gallaread vs. AMP Incorporated, et al
1994-97	Volvo - GM Heavy Truck Corporation vs. HM Holdings, et al
1994-95	State of Arizona vs. Mission Industries
1995-97	Kennington Ltd., Inc. vs. ITT Corporation D
1995-2003	Refinery Holding Company, L.P. vs. El Paso Refinery, et al
1995-1998	Lewis vs. F.A.G. Bearing Corp., et al T/D
1995-1996	Lambda vs. Mission Industries
1996-1996	Jordan - Botke Enterprises dba PW Environmental vs. Santa Barbara MTD
1996-1997	Siemens Components, Inc. vs. Applied Technology, Litton Systems, et al.
1996-1999	Honeywell Inc. vs. General Electric Company
1996-1998	Kern High School vs. KC Environmental Health Services Department
1996-1998	Leonard vs. Texaco, G&M Oil, Mohawk Petroleum, Getty Oil, Shell Pipeline, TRMI, ARCO, Four Corners Pipeline, Shell Oil Co.

DR. LORNE G. EVERETT
President/CEO
L. Everett & Associates, LLC.
3700 State Street, Suite 350
Santa Barbara, CA 93105
Phone: (805) 880-9300
e-mail: leverett@everettassociates.net
www.everettassociates.net

1997-1999	D.W. Smith, et al. vs. Exxon Co., USA.
1997-1999	Griggs Construction vs. Furbreeders, Inc. T
1997-1998	Kimberly, et al. vs. Bob Burglin, et al.
1997-1998	Rachel Pray vs. Redwood Oil Co.
1997-1999	BGPAA vs. Lockheed Inc. D
1998-2000	Anthony vs. Chevron et al.
1999-2000	County of Ventura vs. Eagle Star Ins. Co.
1999-2000	Aguayo, et al. vs. Betz Dearborn, Inc., et al.
1999 –2000	GBF/Pittsburg Landfills Respondents Group v. Contra Costa Waste Services
2000-2003	Capitol Pacific Holdings, Inc. vs. Orange County Fire Authority
2000-2003	Hughes, et al. v. FAG Bearings Co T/D
2000-2003	Miami International Airport (Dade County), Florida vs. United States Department of Justice DT
2000-2000	Redlands Tort Litigation (Contract signed but Co conflict resulted in withdrawal)
2001-2002	Dole Foods vs. Oahu Water Supply Board
2001-2002	Dole Foods vs. Akee et al.
2001-2002	State of New Mexico vs. General Electric, et al. (Conflicted out)
2001-present	REV 973, LLC, a California limited liability co. vs. John Mouren-Laurens
2001-2001	City and County of Honolulu vs. Clinton Churchill, et al.
2001-2001	Shockley, et al. vs. Sabreliner et al.
2001-2004	Associated Aviation Underwriters vs. Miami-Dade County
2002-2002	Ogner Motor Cars Inc. vs. Valley Park Ford, Inc. D
2002-2002	Acosta, et al. vs. Shell Western Exploration, etc., at al. (Contract signed but conflicted out)

DR. LORNE G. EVERETT
President/CEO
L. Everett & Associates, LLC.
3700 State Street, Suite 350
Santa Barbara, CA 93105
Phone: (805) 880-9300
e-mail: leverett@everettassociates.net
www.everettassociates.net

2002-2003	Sebouh Isagholian dba Prime Auto Parts & Salvage, Inc. vs. Quikrete
2002-2002	W. Huhn, Tank Lines Inc. vs Dico Oil et al
2002-2003	Neodesha, KS vs Amoco Oil et al
2002-2003	Sugar Creek, MO vs Amoco Oil et al
2003-2004	Zanoli vs. City of San Luis Obispo
2003-2004	Kram vs. Wierda
2003-2004	National Bank of California vs. Industrial Zinc et al.
2003-2010	Angeles Chemical Co etc. vs. McKesson (Chemical) Corporation etc. D
2003-2003	Lopez Family vs. Stanislaus County T/D
2003-2004	Espinola, et al. vs. Oakley-Avalon, et al. T/D
2004-2009	C. M. Clark et al vs City of Santa Rosa et al T/D
2004-2004	UST Case #040259, PG&E Chico vs CRWQCB
2004-2008	Lodi Chrome vs. City of Lodi
2004-2006	Porta Bella LLC vs. City of Santa Clarita T/D
2005-2005	Smith vs Dresser
2004-present	Joan Schwan et al. vs. CNH, Inc. et al.
2005-2006	Parco Land, Inc. & Accuride International, Inc., vs. Parco, Inc and DOES 1-10 D
2005-present	Shannon Franco, et al. v. Coronet Industries, Inc., et al.
2005-2006	City of Pomona vs. John Michael Faull et al. T/D
2006-COI	Patricia Baumbach et. al. vs. ExxonMobil Corp. et. al.
2006-2007	Martha C. Miller, et al. vs. Mandrin Homes, Ltd.
2007-2009	Gerard DePascale, Liam Neville, and Joanne DePascale vs. Sylvania Electric Products Inc. et al. T/D
2007-2008	Splendid Cleaners, Inc. vs. Victor Goldenberg; et al. T/D
2007-2009	Tyanna and Jeff Cannata et al. vs. Forest Preserve of DuPage County et al. D

DR. LORNE G. EVERETT
President/CEO
L. Everett & Associates, LLC.
3700 State Street, Suite 350
Santa Barbara, CA 93105
Phone: (805) 880-9300
e-mail: leverett@everettassociates.net
www.everettassociates.net

2007-2009	Pacific Gas & Electric Company vs. Lange, et al.
2007-2008	Hinds Investments, L. P., et al. vs. United Fabricare Supply, Inc., et al.
2008-2010	Cindy Avila, et al., vs. CNH America, LLC, et al.,
2007-2008	Debra Bebernes et al vs. Renee Condit et al. D
2009-2009	Perez vs. Forest Preserve District of Du Page County et al
2009-2012	Picerne Military Housing, Inc. et al vs. American International Specialty Lines Insurance Company D
2009-2009	Houshang Rahban et al vs. Detrex Corporation
2009-2011	Susan and Patrick Stoll, Mary and Charles Bowles vs. Kraft Foods Global, Inc. D
2010 –present	Remson et al vs. Verizon, et al D
2010-present	KB Gardena Building, LLC vs. Whittaker Corporation, Brasscraft Manufacturing Co., Bog "B" Transportation, Alphonse Vanbastelaar
2010-present	Hawker Pacific, Inc. vs. United States Environmental Protection Area 1 Superfund Site North Hollywood Operable unit
2010-2012	Hinds Investments, L.P. and Thomas Hinds vs. Thu X. Hunyh and Ban T. Hunyh et al. D
2010-2012	Steadfast Insurance Company, et al. vs Terracon Consultants, Inc.et al. D
2011-2012	S. Beery & Tracy M. Johnson et al., vs. Prime Tanning Corp.et al. D
2011-2012	Gerard DePascale, Liam Neville, and Joanne DePascale vs. Sylvania Electric Products Inc. et al. D T
2012-present	Hescox-City of Colton v. American Promotional Events, Inc et al
2011-present	Kathleen McHugh and Deanna Schneider, et al. vs. Madison-Kipp Corporation, et al.