



Technical Consultation, Data Analysis and
Litigation Support for the Environment

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November 20, 2014

Rachel Mansfield-Howlett
Provencher & Flatt, LLP
823 Sonoma Ave.
Santa Rosa, CA 95404

Subject: Comments on the Walt Ranch Project, Napa County California

Dear Ms. Mansfield-Howlett:

I have reviewed the July 2014 Draft Environmental Impact Report (DEIR) for the Walt Ranch Agricultural Erosion Control Plan Application (ECPA) #P11-00205-ECPA ("Project"). The Project site is located west of State Route 121 (Monticello Road) in the Capell Creek and Milliken Reservoir watersheds in south-central Napa County, California. Within the 2,300-acre Project area, 507 acres will be cleared to create 356 acres of vineyards.

I have prepared comments on impacts from Project construction and operation on water supply and the impacts to the aquifer from increased pumping, and impacts on water quality from construction and operation of the Project. A revised DEIR should be prepared to adequately discuss these issues and to identify mitigation measures, where necessary. In my professional opinion the DEIR is deficient to such a degree it fails to act as a full disclosure document regarding the adequate analysis of the significant environmental impacts of the project. The omissions in the data and analysis render this DEIR inadequate and incomplete for the reasons stated below.

Water Supply

Impacts on Groundwater Inadequately Evaluated and Mitigated
Groundwater withdrawal to meet Project demands will have uncertain impacts on the Sonoma Volcanics aquifer that will supply 100% of the water needs. The DEIR admits:

Due to the highly fractured nature of the Sonoma Volcanics and subsequent folding of the geology, it can be difficult to predict the influences of groundwater pumping over long distances in these rocks (p. 4.6-18).

The groundwater that is present within the Sonoma Volcanics fills fractures, fissures, and joints. These fracture systems are not homogenous or continuous and therefore pose a challenge for attempting to predict drawdown in nearby wells through use of groundwater models.

According to the DEIR, the nearest off-site well (Gale Well) is less than 1,000 feet south of the property boundary and approximately 3,500 feet southwest of the nearest well on the Walt Ranch property (WR-5). There are also four wells (CS-1, CS-2, CS-3, and CS-4) on the Circle S Ranch to the west; the closest Circle S well (CS-2) is over 4,000 feet northwest of the closest Walt Ranch well (WR-5). The DEIR also states (p. 4.6-18):

The Circle Oaks County Water District (COCWD) may also have two wells and a spring water source located along the southern Walt Ranch property boundary; numerous attempts to contact the COCWD to participate in the groundwater study (Appendix D) went unanswered.

To assess the impacts of Project pumping on the underlying Sonoma Volcanics aquifer, an aquifer test (pump test) was performed. The results of the aquifer test are described in the DEIR (p. 4.6-48):

The software used to calculate theoretical drawdown in these offsite wells assumes the aquifer is uniform and isotropic, which is not necessarily representative of the fractured/jointed rocks within the Sonoma Volcanics. Typical rock aquifers transmit groundwater through open, interconnected fractures and joints in the rocks, and the transmissivity over long distances may not progress uniformly.

While it is not anticipated that groundwater levels in nearby offsite wells would be substantially affected by the Proposed Project, this impact is still considered potentially significant and subject to mitigation because the complex nature of well interactions within a fractured volcanic aquifer system, combined with climatic variations, make it infeasible to predict with absolute certainty the long-term impacts associated with ongoing groundwater extractions at the project site.

The DEIR admits great uncertainty about impacts to the aquifer from Project groundwater withdrawal. To address this uncertainty, the DEIR provides for mitigation that includes (Mitigation Measure 4.6-4): submittal of data to the county to include static water levels, pumping water levels, instantaneous flow rates, and cumulative pumped volumes for each of the three existing onsite wells and any wells that may be developed in the future.

Because, as admitted in the DEIR, there is so much uncertainty about the degree and the extent of drawdown, additional mitigation should be included in a revised DEIR to include:

- A prohibition on new groundwater wells. The DEIR states that pumping for the Project can be met through use of the three existing wells. New wells are proposed only “to spread out groundwater production over the property in order to reduce the reliance on any one well” (DEIR p. 4.6-20). New wells should be prohibited because of the potential for an increase in pumping from the aquifer.
- Provisions for additional water-level monitoring in the aquifers underlying the Project. The monitoring that is proposed in Mitigation Measure 4.6-4 is for water levels, flow rates, and pumped volumes in the three existing onsite wells. No provisions are made in the DEIR for monitoring in offsite wells. Mitigation measures should be added to a revised DEIR to include the drilling and completion of “sentry wells” at the property boundary that would be placed in proximity to the offsite wells at the Circle S Ranch and the COCWD wells. These sentry wells should be monitored, along with the other proposed monitoring in Mitigation Measure 4.6-4, and the data should be submitted to the County (and to the adjacent well owners) for evaluation. If water levels were to drop below an agreed-upon trigger level, pumping in the Project wells would have to be restricted or abated.

The trigger level would be established in a Memorandum of Understanding between the Project applicant and the County. A binding agreement such as this, where a drop in water levels would trigger a reduction or a cessation of groundwater pumping, was part of an EIR that was approved for the Cadiz Water Project in San Bernardino County.¹ For the Cadiz water project, a Groundwater Management, Monitoring, and Mitigation Plan was prepared that provided third-party well owners an opportunity to participate in a monitoring program that triggers corrective action (e.g., provision of replacement water) if static groundwater levels in their wells or in springs drop due to Project operations. As in the Cadiz agreement, compliance with this Management Plan shall be overseen and enforced by the County under the MOU.

The DEIR should be revised to include a Groundwater Management, Monitoring, and Mitigation Plan that would provide for monitoring of static water levels in the Sonoma Volcanics Aquifer in three newly constructed sentry wells and in wells that are operated by adjacent land owners, including the Circle S Ranch and the COCWD wells. The trigger level should be agreed upon, and memorialized in the MOU, in consultation with stakeholders to include the Circle S Ranch and the Circle Oaks community.

Aquifer Impacts from Drought Scenarios Inadequately Considered

Impacts from Project groundwater pumping in combination with a prolonged drought were inadequately evaluated. The DEIR includes a superficial treatment of the impacts of drought, in combination with Project pumping, stating (p. 4.6-49):

... groundwater dynamics of the local area are subject to seasonal and annual fluctuations due to variation in rainfall amounts. In the case of a year with extremely high precipitation, deep percolation would refill the aquifer and would offset the amount of groundwater extracted for

¹ http://www.sbcounty.gov/Uploads/lus/Cadiz/FINAL_COUNTY_GMMMP_SEPTMBER_2012.pdf

the Proposed Project. In years of low precipitation, substantial storage would still exist beneath the project site, but recharge could be affected because water demands from the Proposed Project will be greater than the recharge volume in that year, resulting in a lowering of local groundwater levels during such a year. However, RCS Geologists determined that there is sufficient groundwater volume beneath the project site that the Proposed Project would have a less-than-significant on groundwater storage volumes.

The groundwater analysis in Appendix D looked only at proposed groundwater pumping in the context of both the long-term average annual precipitation and the average drought year. California now faces one of the most severe droughts on record. No one can predict when the current drought will end and impacts of groundwater supplies across the state have been dramatic.

The DEIR should be re-written to include a severe drought scenario, not just an average drought, with extended periods of below average rainfall. The severe drought scenario should include model predictions to cumulative impacts on groundwater wells on adjacent properties.

Additionally, a revised DEIR should include scenarios for average rainfall that would use the estimate of 35 inches as estimated by the Project consultant only as the high end of the range (p. 4.6-1). An average of 24.78 inches -- as presented in Appendix D to the DEIR for the Napa State Hospital, the nearest rain gauge to the project -- should be used in estimating annual rainfall for input into groundwater models. The average rainfall should be also considered when calculating evaporation from the four proposed groundwater storage reservoirs. The DEIR states, based on the average annual precipitation of 35 inches, rainfall directly into the storage reservoirs will be approximately 27.4 af annually and will offset evaporative losses from the reservoirs. If instead, the Napa State Hospital average of 24.78 inches is used, the evaporation will likely exceed precipitation recharge. A revised DEIR should include the more-conservative rainfall estimate from the Napa State Hospital records and factor in any losses from the reservoirs in calculating Project demand on groundwater.

Under a "worst case scenario" the DEIR (Appendix D) makes no estimates of water demand from the adjacent wells under the operation of the Circle Oaks County Water District (COCWD). Appendix D to the DEIR only includes, in its "worst case," pumping from the four wells (CS-1, CS-2, CS-3, and CS-4) on the Circle S Ranch to the west - the closest Circle S well (CS-2) is over 4,000 feet northwest of the closest Walt Ranch well (WR-5). Without incorporating the demand from the COCWD wells, the degree of the impact to their water supply has not been adequately estimated.

The cumulative impacts in the DEIR analysis for pumping of the aquifer under the Project fails to include consideration of: (1) a severe drought scenario; (2) a rainfall scenario that uses the Napa State Hospital data for the annual average; and (3) pumping from the all wells in the nearby vicinity. A revised DEIR should be prepared to model, for cumulative impacts, pumping from the COCWD wells, in combination with groundwater recharge under an average rainfall year (consistent with the Napa State Hospital rain gage) and during a severe drought, for true worst-case scenarios.

Need for Water During Construction not Considered

Water will be required for construction of the project, mainly to mitigate air quality impacts that would result from fugitive dust emissions. The DEIR states (p. 4.1-12):

Conversion of the existing landscape to vineyard requires clearing of vegetation and earthmoving activities, which would expose bare soil to wind erosion, thereby potentially generating fugitive dust. The total area of land to be cleared for vineyard is 507 acres. Earthmoving activities would occur between April 1 and September 1 in the Milliken watershed and between April 1 and October 1 in the Capell watershed in 2015, 2016, 2017, and 2018.

The DEIR identifies the use of water trucks as necessary for dust suppression during mass grading and fine grading. Table 4.1-3 shows that two water trucks will operate for 968 hours. The DEIR does not identify the source of this water.

A revised DEIR should be prepared to identify the source of the water to be used for dust suppression during project construction. If the source to be used is groundwater, the DEIR should add the groundwater demand from construction to the demand from Project operation for vineyard cultivation and frost protection. This total demand should be used in a revised groundwater model, to be included in a revised DEIR, to more accurately predict aquifer impacts from the Project.

Estimates of Groundwater Use or Inconsistent with Other Vineyard Projects

Groundwater will be required for operation of the Project. The DEIR estimates a maximum annual demand of 173.5 acre feet (af) to be required for vineyard cultivation and 40 af per year frost protection for a total water use of 213.5 af per year.

The DEIR estimates vineyard water demand at a rate of 68 gallons per vine per year (p. 4.6-17). This estimate appears unusually low, when compared to other estimates of demand made in CEQA documents for other Napa Valley vineyard projects. For example, the estimate used for the Upper Range Vineyard Project - Rodgers Property was 2 to 5 gallons per week, which calculates to 104 gallons per vine per year to over 260 gallons per vine per year², well in excess of the estimate made in the Project DEIR. In fact, a report prepared by the Project's consultant for a Napa vineyard project estimates water demand per vine to be 6 gallons per week over an 18 week irrigation season for a total annual water demand of 108 gallons per vine per year³.

If the upper end of the estimate used in other Napa vineyard projects is used (260 gallons per vine per year), estimated water needs for irrigation would increase by nearly a factor of 4, from the estimate made in the DEIR of 173.5 acre feet per year to 663 acre feet per year. Even if the estimate made by the

² Upper Range Vineyard Project - Rodgers Property, Supplemental Draft EIR, August 2008, p. 2-4
<http://www.countyofnapa.org/WorkArea/DownloadAsset.aspx?id=4294970934>

³ Stagecoach Vineyards, Final EIR, September 2008, p. 4-41
<http://reports.analyticalcorp.net/stagecoach/eir/final/report.pdf>

Project's own consultant for the other Napa vineyard is used (104 gallons per vine per year), water demand for cultivation would be increase by a factor of 1.6, from the estimate made in the DEIR of 173.5 acre feet per year to 276 acre feet per year.

A revised DEIR needs to be prepared to substantiate irrigation water demand estimates on a per-vine basis. Use of a higher, more conservative estimate is recommended to account for higher water demands during periods of extended drought, like the drought that all of California currently faces. Use of a higher per-vine water demand value should be used in a revised groundwater model, to be included in a revised DEIR, to predict impacts to the underlying Sonoma Volcanics Aquifer, including drawdown on neighboring wells.

Water Quality

Surface water quality in the vicinity of the Project is impaired. Project construction and operation may further impair water quality. A revised DEIR should be prepared to include additional provisions for protection of water quality.

The Napa River is identified as impaired by nutrients, pathogens, and sediment loading according to Section 303(d) of the Clean Water Act. The San Francisco Bay Regional Water Quality Control Board (RWQCB) has released a technical report that proposes a total maximum daily load (TMDL) for the Napa River that calls for substantial reductions in the amount of fine sediment deposits into the watershed to improve water quality and maintain beneficial uses of the river, including spawning and rearing habitat for salmonid species

The Capell Creek watershed on the project site is tributary to Lake Berryessa, which is part of the Putah Creek watershed. Putah Creek and Lake Berryessa are listed by the Central Valley RWQCB as contaminated for mercury and boron, according to Section 303(d) of the CWA. (DEIR, p. 4.6-8.)

Construction Impacts are not Adequately Identified or Mitigated

Project construction will involve crushing, blasting, ripping, grading and excavation. All of these earth-disturbing activities will loosen surficial soils and lead to an increased potential for erosion of those materials.

To address the increased erosion potential, an Erosion Control Plan has been prepared and included as Appendix A to the DEIR. Mitigation measures intended to reduce erosion and sedimentation are included in the DEIR as Mitigation Measures 4.4-1 to 4.4-3.

None of these measures adequately address sediment that will be generated during construction and that may be subject to erosion via stormwater runoff. Stormwater runoff from the project site would be eventually transported to Napa River which is listed as sediment impaired under Section 303(d) of the Clean Water Act (CWA).

To address sediment generated during construction, project greater than one acre in size are subject to provisions of the California Construction General Permit (Permit), effective July 2010.⁴ Among other provisions, the permit requires:

- Detailed best management practices (BMPs) that must at a minimum be implemented;
- Monitoring and reporting for pH and turbidity in storm water discharges to determine whether action levels have been exceeded; and
- A stormwater pollution prevention plan (SWPPP) and a rain event action plan (REAP).

The DEIR does not acknowledge the applicability of the Permit other than to say:

It is assumed that the Proposed Project, which is agricultural in nature, would not require coverage under the NPDES General Permit. However, the Erosion Control Plan (ECP) would be sufficient to cover the stormwater management requirements under the General Permit if required (p. 4.6-22).

To reach the conclusion that the Permit does not apply to the Project because it is “agricultural in nature” is in error. The Permit states that projects not covered are those which are

Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.⁵

Since this project involves road construction and blasting operations, the conclusion that the Permit does not apply is in error. A revised DEIR should be prepared to affirm the applicability of the Permit to Project construction and to include mitigation measures that would incorporate Permit requirements. Such mitigation measures are not part of the Erosion Control Plan and would include:

- Preparation of a SWPPP for inclusion in a revised DEIR
- Identification of BMPs that would be effective in reducing sediment loading to the Napa River, consistent with the TMDL, to include provisions for use of the following during construction
 - Placement of fiber rolls, straw wattles and silt fences on slopes that have been disturbed;
 - Hydroseeding;
 - Provisions for covering soil and rock stockpiles;
 - Vehicle maintenance and fueling safeguards;
 - Post-construction revegetation; and
 - Use of track out prevention measures (rumble strips).

These measures, and others, should be included in the SWPPP to be attached as an appendix to the revised DEIR. The mitigation measures included in the SWPPP should be specially evaluated for their

⁴ http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

⁵ http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo2009_0009_dwq.pdf, p. 5

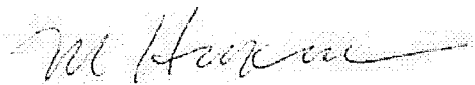
effectiveness in addressing the impairments noted in the watersheds that will be affected by the project, including sediment in the Napa River, and mercury and boron in Putah Creek and Lake Berryessa. The potential for the rock crushing and blasting operations to act as a source for mercury and boron loading, for example, should be evaluated. By crushing and blasting rock, the surface area of the rock will be increased, thereby potentially creating a greater potential for the mercury and boron to leach from the rock material when contacted by rainfall and stormwater.

Operational Impacts to Water Quality are not Adequately Identified or Mitigated
The Project will involve the use of pesticides and fertilizers. The potential for stormwater runoff to contribute pesticides, nutrients and trace metals (boron and mercury) during operation of the Project has not been adequately considered or mitigated.

The DEIR states that the Project would utilize fertilizers to include: nitrogen, phosphorus, potassium, micro-nutrients, and compost. Napa River is identified as impaired by nutrients, yet the DEIR makes no specific provisions to protect the Napa River from further impairment from nutrients generated from Project operation other than to say that use of Mitigation Measure 4.2-4 (crop management, integrated pest management, proposed setbacks) will effectively filter sediments, agricultural chemicals, and nutrients to a less-than-significant level. No substantiation of this claim is made in the DEIR.

A revised DEIR needs to acknowledge that BMPs need to be evaluated for effectiveness in light of the sediment and nutrient impairment of the Napa River and to provide substantiating data to show that the proposed BMPs will be effective. A revised DEIR is also necessary to address the potential for the generation of dissolved mercury and boron that would result from Project blasting and rock crushing. Because the rock that underlies the Project contains these metals, the crushing and blasting activities will increase the surface area of the rock, potentially leading to increased loading to Putah Creek and Lake Berryessa, both of which are impaired for mercury and boron.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Hagemann", with a horizontal line extending to the right.

Matt Hagemann, P.G., C.Hg., QSD, QSP



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**Geologic and Hydrogeologic Characterization
Industrial Stormwater Compliance
Investigation and Remediation Strategies
Litigation Support and Testifying Expert
CEQA Review**

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.

B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certification:

California Professional Geologist

California Certified Hydrogeologist

Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – present;
- Senior Environmental Analyst, Komex H2O Science, Inc (2000 – 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt’s responsibilities have included:

- Lead analyst and testifying expert in the review of numerous environmental impact reports under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions and geologic hazards.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Manager of a project to provide technical assistance to a community adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Technical assistance and litigation support for vapor intrusion concerns.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt’s duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.

- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nationwide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt currently teaches Physical Geology (lecture and lab) to students at Golden West College in Huntington Beach, California.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Colorado.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal representatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

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Other Experience:

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