

From: Christine.Sherer@LW.com <Christine.Sherer@LW.com>

Sent: Tuesday, May 22, 2018 5:32 PM

To: Smith, Ashley <Ashley.Smith2@sdcounty.ca.gov>; Neufeld, Darin <Darin.Neufeld@sdcounty.ca.gov>

Subject: Golden Door Comment on Newland Sierra GHG Mitigation

Attached is a comment letter from Kathy Van Ness of the Golden Door on the Newland Sierra project.

Christine Sherer

Legal Secretary

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Darin Neufeld
Ashley Smith
Planning and Development Services
County of San Diego
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Dear Mr. Neufeld and Ms. Smith:

I am writing on behalf of the Golden Door, to follow up my letter in January of this year asking that the County of San Diego (County) to do its part to ensure that greenhouse gas (GHG) emissions are reduced within the County. For your reference, I have included that letter here and ask that you include this letter and its attachments into the administrative record for the Newland Sierra project.

As you know, the Golden Door is a world class spa and resort committed to sustainability and environmental stewardship. We are much more than just a spa. We are also owners and operators of a significant agricultural operation, continuing a long agricultural tradition in our rural Twin Oaks Valley community. We have developed new water sources to feed our groves, prepared our soil with natural nutrient sources, and cultivated our trees for optimal health. At Golden Door, we believe in renewing our land to help revitalize the environment. We have transplanted thirty-five 30-year-old Manzanilla olive trees from a commercial orchard. recently added 131-acres of citrus groves to our agricultural holdings, and brought new life to over 75 acres of now fruitful avocado groves. With the growing threat of climate change, the Golden Door is committed to ensuring it reduces its on-site GHG emissions.

As such, we write today with particular respect to the Newland Sierra Project's significant GHG emissions impacts. Newland proposes mitigation measures M-GHG-1 and M-GHG-2 to require the Project to offset 100 percent of its GHG emissions from construction and operations. Both mitigation measures employ the following "geographic priority" scheme for such offsets:

- 1) project design features/on-site reduction measures;
- 2) off-site within the unincorporated areas of the County of San Diego;
- 3) off-site within the County of San Diego;
- 4) off-site within the State of California;
- 5) off-site within the United States; and
- 6) off-site internationally.

Newland's mitigation measure M-GHG-3 would implement design features alleged to mitigate 18 percent of the Project's operational emissions, leaving 100 percent of construction emissions and 82 percent of operational emissions to be mitigated through the purchase of off-site carbon offset credits.

Due to the Golden Door's significant concerns regarding the proposed Newland project, it retained Phyllis Fox, Ph.D., to analyze GHG issues related to the proposed Newland Sierra project. Dr. Fox already submitted a detailed report on the Newland DEIR's air quality and GHG

impacts analysis. As a General Plan Amendment project, the Newland Project could attempt to proceed pursuant to the carbon offset mitigation scheme set forth in the recently adopted Climate Action Plan, which on the requirements for "feasibility" set forth by the California Environmental Quality Act. Dr. Fox has drafted a report analyzing GHG mitigation proposals for the Newland Project and describing numerous mitigation measures that are likely feasible and should be considered – many of which have been adopted for other projects or endorsed by public agencies. The Golden Door submitted this report as a comment on the County's recent consideration of its Climate Action Plan. It is attached here as well, and it should be considered as a supplement to her prior comments on the Newland project. Each mitigation measure discussed in Dr. Fox's report – mitigation for both construction and operations emissions – should be considered by the County as part of EIR certification for the Project.

Thank you for your time and attention to our comments. Please do not hesitate to contact us should you have any questions or comments.

Best Regards,

A handwritten signature in black ink, appearing to read 'Kathy VanNess', with a long, sweeping horizontal line extending to the right.

Kathy VanNess
Chief Operating Officer/General Manager
Golden Door Properties



GOLDEN DOOR®

San Diego County Planning Commissioners
c/o Lisa Fitzpatrick, Planning & Development Services
5510 Overland Avenue, Suite 110
San Diego, CA 92123
Lisa.Fitzpatrick@sdcounty.ca.gov

Dear Commissioners,

The Golden Door is a world class spa and resort committed to sustainability and environmental stewardship. But we are much more than just a spa, we are also owners and operators of a significant agricultural operation, continuing a long agricultural tradition in our rural community. We have developed new water sources to feed our groves, prepared our soil with natural nutrient sources, and cultivated our trees for optimal health. At Golden Door, we believe in renewing our land to help revitalize the environment. We have transplanted thirty-five 30-year-old Manzanillo olive trees from a commercial orchard, recently added 131-acres of citrus groves to our agricultural holdings, and brought new life to over 75 acres of now fruitful avocado groves. With the growing threat of climate change, the Golden Door is committed to ensuring it reduces its on-site greenhouse gas (GHG) emissions. As such, we ask that the County of San Diego (County) does its part to ensure GHG emissions are reduced within the County.

We are concerned that the Climate Action Plan (CAP) does not do its part to ensure California will achieve GHG reduction mandates set by the legislature. For example, the CAP should require that GHG impacts resulting from general plan amendments (sprawl projects) are mitigated using local GHG emission reductions projects. Local emission reductions projects include local boiler efficiency upgrades, reforestation projects, compost additions to rangeland, organic waste digestion, livestock management, urban forest and urban tree planting, and weatherization.

But, the CAP doesn't require mitigation projects for general plan amendments to be local. Instead, the CAP allows offset mitigation projects to occur off-shore, anywhere in the world unrestrained. A private developer can merely buy offset credits from a foreign entity, claiming to have reduced GHG emissions. Doing so may be hard to enforce, and off-shore offsets deprive County residents the localized reductions necessary to meet the County's goals, and the economic benefits associated with conducting offset projects within the County. Reducing GHG emissions in the County also has the important benefit of reducing other toxic air pollutants, known as co-pollutants, so that San Diego County residents will be able to breathe cleaner air. In fact, the California Air Resources Board has recognized the important "co-benefits" of reducing GHGs, such as contributions to the "green economy" and improving public health.

The CAP does provide one conceptual program for investment in local emissions-reducing projects. However, these local direct investment projects are "already spoken for," because they are needed to reduce GHG emissions from planned development already in the approved general plan. The development projects that

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require amendments to the general plan create new additional GHG emissions. The County must identify new local emissions-reducing projects that will mitigate these new additional GHG emissions before amending the general plan to allow more development in rural areas. Unfortunately, the CAP's proposal allows for unlimited sprawl development to move forward in reliance on a program of off-shore offsets that reneges on the County's promises and deprives its residents of important co-benefits.

The County's proposed off-shore offset program for sprawl projects would not meet the County's obligation to reduce its fair share of GHG emissions within the County and would deprive County residents of important co-benefits. County residents would miss out on potential reductions in toxic co-pollutants and commute times on our already congested roadways. The County's proposal would also deprive the local San Diego economy of important investment in green projects.

Also, off-shore offset projects encourage the setting aside of land in low- and lower-middle-income countries, which may impair economic development in those countries. Land that might otherwise be used by local governments for housing or other infrastructure projects, projects which might enable those developing economies to grow, is instead set aside by private developers. Similar impacts have occurred here in California, such as in Owens Valley, where residents were deprived of water in order to fuel Los Angeles' growth at the cost of Owens Valley's environment and economy. The County should not similarly depress low- and lower-middle-income countries in order to develop San Diego. We simply have no way to know what the ripple effects will be from imposing offset mitigation requirements in other states or countries where the County lacks authority and oversight. Environmental justice considerations at home and abroad must be taken into consideration.

Further, the effects of paying landowners not to farm their land (one such potential offset measure) may have unintentional consequences. Allowing land to lay fallow may result in greater flooding, as the land may not appropriately drain without assistance from crops. The County must consider the effects of these types of offset projects and others.

We ask that the County live up to its promises and require that offset projects and measures occur within San Diego County first. Action can be taken in the County to combat GHG emissions, and local businesses and landowners should be allowed to innovate before the County looks to other parts of the globe. The County's proposal in the Final CAP, to rely on off-shore offsets as justification for approving sprawl development projects, is a dereliction of duty and should be re-visited and revised before the County approves this important plan to reduce GHG emissions.

We thank you for your time and attention to our comments.

Best Regards,

A handwritten signature in black ink, appearing to read 'Kathy VanNess', written over a horizontal line.

Kathy VanNess
Chief Operating Officer/General Manager
Golden Door Properties

Phyllis Fox, PhD, PE
745 White Pine Avenue
Rockledge, FL 32955
321-626-6885

Kathy Van Ness
General Manager/Chief Operating Officer
Golden Door
777 Deer Springs Road
San Marcos, CA 92069

Dear Ms. Van Ness:

The County of San Diego is in the process of developing a Climate Action Plan (CAP) that will serve as a comprehensive strategy guide to reducing greenhouse gas (GHG) emissions in unincorporated areas of San Diego County, such as those where the Golden Door is located. The CAP primarily focuses on reducing GHG emissions by 2020 and 2030, consistent with legislatively adopted state targets. The Final Supplemental Environmental Impact Report (Final SEIR) for the CAP¹ argues that requiring further GHG reduction would be “speculative” with the information known today due to uncertainty regarding future technological advances and changes in state and federal law beyond 2030.²

However, the Final SEIR for the CAP concluded that impacts from the CAP are “significant and unavoidable.”³ An EIR may conclude that an impact is significant and unavoidable only if all available and feasible mitigation measures have been proposed, but are inadequate to reduce the impact to a less than significant level.⁴ The lead agency cannot simply conclude that an impact is significant and unavoidable without requiring all feasible mitigation.

Mitigation Measure GHG-1 in the CAP’s Final SEIR provides geographic priorities for GHG mitigation required to be implemented for General Plan Amendment projects, beginning with (1) project design features/on-site reduction measures; (2) off site within the unincorporated areas of the County of San Diego; (3) offsite within the County of San Diego; (4) offsite within the State of California; (5) offsite within the United States; and (6) offsite internationally⁵ The County has indicated in responses to comments and public statements that a feasibility determination complying with CEQA’s feasibility standards will be required for a

¹ San Diego County, Climate Action Plan; available at https://www.sandiegocounty.gov/content/sdc/pds/ceqa/Climate_Action_Plan_Public_Review.html

² Final SEIR, p. 2.7-22.

³ Final SEIR, p. 2.7-23.

⁴ See Cal. Code Regs. Title 14 (“CEQA Guidelines”), § 15126.2.

⁵ San Diego County, Climate Action Plan, p. 8-52.

project to move from mitigation in one geographic priority area to a subsequent geographic priority area on the list. The Newland Sierra Project uses a similar geographic priority list in GHG mitigation measures listed in its Draft EIR⁶ but fails to include all feasible mitigation in one priority area to the next with the result that 18% of the mitigation is on-site and the balanced unenforceable and unidentified off-site mitigation measures.

The CAP has failed to require all feasible mitigation for greenhouse gas emissions from new developments. Instead, the County has styled the CAP as an “adaptive management plan” that would be adjusted based on future progress, technological innovations, and legislative changes. However, many GHG mitigation measures are currently available that could be required in the CAP to further reduce GHG emissions. These are discussed below with respect to the Newland Sierra Project, which will be located within the unincorporated area covered by the CAP and involves the full range of impacts and issues the CAP should address. While the GHG mitigation measures discussed below apply specifically to Newland Sierra, they should be considered feasible mitigation measures that must be considered in the feasibility determinations to be made with respect to the CAP’s list of geographic priorities.

1. NEWLAND SIERRA GHG MITIGATION IS INADEQUATE

Newland Sierra⁷ proposes to develop a 1,985-acre site west of Interstate 15 in rural San Diego County, about 6.4 miles north of the City of Escondido and about 4.6 miles north of the city of San Marcos (Newland Sierra Project or Project). Thus, it falls within the CAP project area. The Newland Sierra Project would include:

- 875 single family dwelling units
- 935 multi-family dwelling units
- 325 senior adult dwelling units
- 81,000 square feet of neighborhood commercial
- 6-acre, 555-student K-8 school site
- 35.9 acres of parks

The County has issued a draft environmental impact report (DEIR) for the Newland Sierra Project (Newland Sierra DEIR).⁸ This DEIR states that total GHG emissions of 52,986 metric tons (MT) of equivalent carbon dioxide (CO₂E) emissions per year (MT CO₂E/yr) will be

⁶ Newland Sierra Draft EIR, pp. 2.7-48, 2.7-51.

⁷ On August 14, 2017, I provided written comments to the County discussing the Newland Sierra Draft EIR’s air quality and GHG analyses. This report’s additional analysis focusing on feasible GHG mitigation is intended to respond to the County’s focus on “feasibility” for the geographic priorities in the CAP, which will also be relevant to the Newland Sierra Project. The County’s proposal to use CEQA’s feasibility standard as the trigger to rely on subsequent geographic priority areas had not been made public at the time of my previous report.

⁸ County of San Diego, Draft Environmental Impact Report, Newland Sierra Project, Prepared by Dudek, June 2017; available at <http://www.sandiegocounty.gov/content/sdc/pds/ceqa/SP-15-001/NSDEIR.html>

reduced by 18% through on-site design features. The remaining 82% of GHG emissions would be reduced through an offset program that does not include any locational requirements or direct investment requirements. The design features and offset program do not constitute all feasible mitigation to mitigate a significant impact under CEQA.

1.1. Operational GHG Mitigation

The Project would generate GHG emissions from vehicular traffic and energy use. The Newland DEIR estimated that the “mitigated” Project would result in 43,498 MT CO₂E/yr in the buildout year and concluded that mitigated GHG emissions would be “potentially significant” (Impact GHG-2).⁹ The DEIR estimated that 18% of the increase in GHG emissions would be mitigated using on-site reductions achieved through a transportation demand management (TDM) program and on-site solar (M-GHG-3). The reduction of the remaining 82% of emissions would be achieved through an offset program that does not have any locational requirements or direct investment requirements (M-GHG-2).¹⁰

The proposed offset program and design features do not satisfy the CEQA requirement that mitigation must be real, permanent, quantifiable, verifiable, and enforceable to satisfy CEQA.¹¹ Further, the Newland Sierra DEIR has failed to require all feasible operational GHG mitigation.

There are many other on-site mitigation measures that could and should have been required before opting for off-site offsets. The following sections first explain why the offset program in M-GHG-2 and the design features in M-GHG-3 are not valid CEQA mitigation, followed by a discussion of additional feasible GHG mitigation that must be required to satisfy CEQA.

1.1.1. Newland Sierra’s Carbon Offset Program Is Not Valid CEQA Mitigation

Newland Sierra’s offset program would “offset” 82% of the project’s GHG emission. This offset program is inconsistent with CEQA and is not valid mitigation for the Project’s GHG emission increases. CEQA mitigation must provide certainty that the reductions will occur, that the claimed reductions are enforceable, and that the mitigation measures do not create additional impacts.¹²

⁹ Newland Sierra DEIR, p. 2.7-42, -46, -72, Table 2.7-8.

¹⁰ Newland Sierra DEIR, Section 7.6.1, pp. 7-42/49.

¹¹ Cal. Health & Safety Code Section 38562(d)(1).

¹² *Madera Oversight Coalition, Inc. v. Cty of Madera* (2011) 199 Cal. App. 4th 48, 83 [“[T]he EIR must describe and discuss feasible mitigation measures for each significant environmental effect, provided feasible measures exist”]; *Gray v. Cty. of Madera* (2008) 167 Cal. App. 4th 1099, 1116 [substantial evidence must show that mitigation measures will be effective and feasible]; CEQA Guidelines, §§ 15126.4, subd. (a)(1), 15091, subd. (b) (2); CEQA § 21081.6.

First, the Newland Sierra offset program proposes only 18% of the GHG reduction on site, forgoing benefits of local mitigation. Many additional feasible on-site GHG emission reduction options are available for the Newland Sierra Project that were not required. In contrast, a similar project, the 21,500-home Newhall Ranch project in north Los Angeles County, along the Santa Susana Mountains between five freeways and the Ventura County line,¹³ proposes 53% of its reductions on site. In general, all feasible on-site mitigation should be required before off-site offsets are used because on-site reductions result in local co-benefits, including better health outcomes for Project and nearby residents, lower energy costs, improved access to transportation options, recreational opportunities, and general resource efficiency.¹⁴ The Newland Sierra Project has failed to meet this goal.

Second, the DEIR fails to require that the offsets offer an equivalent GHG reduction benefit annually, as opposed to a one-time reduction.

Third, the offsets must be local to the extent feasible. The asserted 82% off-site emission reductions are not the extent feasible. Other EIRs have provided more effective requirements for emissions reductions to occur on-site or locally. For example, the CARB Southern California Consolidation Project DEIR¹⁵ requires CARB to fully mitigate the construction-related GHG emissions before any grading takes place and to fully mitigate 100% of its annual operational GHG emissions each year for the life of the project. The Bilby Ridge DEIR also encourages the applicant “to consider generating or purchasing local and California-only carbon credits as the preferred mechanism to implement its off-site mitigation measure for GHG emissions and that will facilitate the State’s efforts in achieving the GHG emission reduction goal.” Compliance “shall be provided” in the application to the lead agency, LAFCo.¹⁶

On-site GHG mitigation is important because it contributes to the mitigation of other significant and unavoidable Project impacts, including AQ-2 (significant construction VOC, NO_x, CO, PM₁₀, PM_{2.5} impacts), AQ-3 (significant daily operational VOC, CO, PM₁₀, PM_{2.5} impacts), and AQ-5 (significant annual VOC, CO, PM₁₀, PM_{2.5}). Thus, all feasible on-site GHG mitigation must be implemented as mitigation for other significant impacts. As discussed elsewhere in these comments, the Newland Sierra DEIR fails to require all feasible on-site GHG mitigation.

¹³ <https://nrm.dfg.ca.gov/documents/ContextDocs.aspx?cat=NewhallRanchFinal>

¹⁴ Office of Planning and Research, Chapter 8, Climate Change, p. 230; available at http://www.opr.ca.gov/docs/OPR_C8_final.pdf

¹⁵ CARB, Southern California Consolidation Project Draft Environmental Impact Report, March 2017 (CARB, March 2017); available at: https://www.dudek.com/SoCalConsolidationCEQA/ARB_SCCP_Draft_EIR_March2017.pdf

¹⁶ Sacramento Local Agency Formation Commission (SLAFC), Draft Environmental Impact Report, Bilby Ridge Sphere of Influence Amendment, December 2017 (SLAFC, December 2017), Prepared by Ascent, Table ES-1, pp. ES-33, ES-39-40; available at http://www.saclafco.org/Documents/Bilby_Ridge_DEIR/Bilby%20Ridge%20SOI%20Amendment-DEIR.pdf

The Project should only purchase and retire carbon credits that have been issued by a recognized and reputable, accredited carbon registry, as apparently assumed for all off-site offsets, if it is impracticable to fully offset operational emissions through direct investments or quantifiable and verifiable programs.¹⁷

The Chevron Refinery FEIR, for example, required Chevron to provide \$30 million over 10 years to fund the implementation of the “Community Greenhouse Gas Reduction Measures”, which measures shall be selected by the City through a public process with input from stakeholders from the City, North Richmond, and Chevron...¹⁸

Fourth, the Newland Sierra DEIR does not establish any limits on the location of the offsets, which could be on other continents under the DEIR’s proposal. In fact, all reductions could be obtained internationally, resulting in no local benefits or mitigation of other significant Project impacts. The County has admitted in its CAP that there are no projects within the County that would qualify for carbon credit sales at this time. This is further incentive to require all feasible on-site mitigation before offsets are considered. Comments 1.1.4 to 1.1.11 discuss additional feasible on-site mitigation that the County should require.

Fifth, the offset program does not require any direct investment in local infrastructure, allowing all off-site reductions to be offset purchases. Offset purchases would not mitigate other significant impacts that would be mitigated by on-site GHG mitigation.

Sixth, the offset program fails to identify nearby GHG mitigation options that have many local co-benefits. The offset program, for example, could require the funding of off-site, solar-powered EV charging stations (Comment 1.1.6) and energy efficiency improvements at existing facilities located in the surrounding communities that will be adversely impacted by the Project, including building retrofits and solar panel installations.

Seventh, the offset program includes a “true-up” provision, at the election of the Project applicant and subject to the County Planning Director’s approval, after Project approval, to reduce the quantity of GHG emissions the applicant is required to mitigate.¹⁹ This would occur outside of CEQA review, preventing public comment.

Eighth, the Newland Sierra DEIR’s offset approach in M-GHG-1 and M-GHG-2 has not been approved by CARB. In fact, CARB recommends that “lead agencies prioritize on-site design features and direct investments in GHG reductions in the vicinity of the project.”²⁰ Without the concurrence of the expert agency on complicated GHG emissions calculations and

¹⁷ SLAFC, December 2017, Table ES-1, p. ES-40.

¹⁸ Chevron Refinery Modernization Project Final EIR, Revisions to Draft EIR Volumes 1 & 2, June 2014, p. 4-26 (Chevron FEIR); available at <https://s3.amazonaws.com/chevron/Final+EIR/Volume+3+Final+EIR.pdf> and Chevron Refinery Modernization Project Environmental and Community Investment Agreement Between City of Richmond, California and Chevron Products Company, A Division of Chevron U.S.A. Inc.

¹⁹ Newland Sierra DEIR, Table S-1, p. S.0-97-99.

²⁰ Newland Sierra DEIR, p. 2.7-47.

offsets, the County is not able to provide adequate assurance that the mitigation measures will be effective. Further, the lack of any enforceability for the “priority” system for the geographic location of offsets renders M-GHG-1 and M-GHG-2 inadequate under the requirements the County placed on itself in its General Plan and General Plan EIR.

Ninth, the offset approach does not require any reporting. The CARB Southern California Consolidation Project DEIR, for example, was considered enforceable “because ARB is required to submit a report as part of the Mitigation Monitoring and Reporting Program before any grading activities demonstrating it has complied with the standards and components of the mitigation measure.” Further, operational emissions are made enforceable by assuring compliance as follows:²¹

- Before ARB begins to occupy and operate the facility, it shall develop a GHG emissions report with the estimated first year facility emissions based on the final design in consideration of MM-GHG-2, and document how ARB is fully mitigating 100% of the first year’s estimated operational GHG emissions generated by the project through the options identified within the mitigation measure. ARB will post this report on ARB’s webpage.
- Every year thereafter (by the beginning of the new fiscal year) for the lifetime of the project (estimated at 30 years), ARB shall prepare an updated report with estimates for the following year’s operational emissions (which may include revised mobile source emissions based on survey data collected for MM-GHG-2), document how ARB is fully mitigating 100% of the projected year’s estimated operational GHG emissions generated by the project through direct investment activities, or by obtaining and retiring carbon offset credits as described in in a quantity sufficient to offset. ARB will post this report on ARB’s webpage.
- If during the lifetime of the project, the operational emissions are eliminated to zero through MM-GHG-2, ARB can publish a final report documenting that determination and end its obligations to further mitigate operational emissions.

1.1.2. Traffic Demand Management (TDM) Program Is Not Valid CEQA Mitigation

The Newland Sierra DEIR assumed that 11.1% of Newland Sierra’s GHG reductions would be achieved through traffic demand management (TDM), detailed in measures project design features PDF-1 through PDF-20.²² These measures rely primarily on “promoting” and “coordinating” activities that stand little chance of being effectively implemented in the Project’s rural setting far from transit infrastructure within a steep Project Site containing circuitous internal roads. “Promoting” and “coordinating” are not enforceable and thus do not qualify as valid CEQA mitigation.

The Applicant has not committed to funding and managing the TDM program. There is no requirement to convert the various “promoting” and “coordinating” activities into GHG reductions for comparison with assumed GHG emission reductions. Who would coordinate,

²¹ CARB, March 2017, Table 1-1, p. 1-2.

²² Newland Sierra DEIR, Table 2.7-7, p. 2.7-60 (“total VMT reduction from implementation of TDM program = 11.1%).

promote, and provide the various features of the TDM program? PDF-20 suggests the residents, through a homeowner's association, would be responsible. Who would pay for and assure that the TDM measures achieve the assumed GHG emission reductions? This measure should be modified to require funding by the Applicant through a Community Facilities District, County Service Area or other nonrevocable funding mechanism.²³

The Newland Sierra DEIR's TDM program is not enforceable and thus is not valid CEQA mitigation. The CARB Southern California Consolidation Project EIR requires an aggressive TDM program designed to encourage the use of alternative transportation options to driving alone in a conventional vehicle.²⁴ The program requires CARB to undertake or fund feasible GHG mitigation, including direct investment opportunities such as funding building retrofit programs that invest in: cool roofs, solar panels, solar water heaters, smart meters, energy efficient lighting, energy efficient appliances, energy efficient windows, insulation, water conservation measures, and other similar retrofit measures associated with green buildings within the geographic area of the SCAQMD. The results will be summarized in a report that quantifies the emissions and credits and provides supporting technical documentation.²⁵ Compliance will be determined as follows:²⁶

Implementation of this option has the potential to reduce operations-related GHG emissions from the transportation sector. The actual amount to be credited toward reductions under the Annual GHG Emissions Report will be based on survey of usage of these incentives. As part of the Monitoring and Mitigation Reporting Program, ARB shall prepare a report that quantifies the emissions and credits and provides supporting technical documentation. ARB will post the report on ARB's webpage. ARB will select the methodologies and self-monitor the Mitigation Monitoring and Reporting Program during the operations phase as described below in the 'Approach to Implementation on MM-GHG-2'.

The CARB DEIR sets out a two-tier process for determining compliance. First, the ARB will seek to directly undertake or fund feasible and cost-effective activities that reduce or sequester GHG emissions on a ton-per-ton basis as follows:

²³ CAPCOA, CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, January 2008, Table 16, p. B-12; available at www.capcoa.org/download/CAPCOA+White+Paper

²⁴ CARB, March 2017, p. 5.7-46/47.

²⁵ CARB, March 2017, p. 5.7-47.

²⁶ CARB, March 2017, Table 1-1, p. 1-21.

Under this option, ARB will seek to directly undertake or fund feasible and cost-effective activities that reduce or sequester GHG emissions on a ton per ton basis to mitigate operational emissions. Direct investment opportunities include, but are not limited to, funding building retrofits programs that invest in: cool roofs, solar panels, solar water heaters, smart meters, energy efficient lighting (including, but not limited to, light bulb replacement), energy efficient appliances, energy efficient windows, insulation, water conservation measures, and any other similar retrofit measures associated with green buildings within the geographic area of the South Coast Air Quality Management District. As part of the Monitoring and Mitigation Reporting Program, ARB shall prepare a report that quantifies the emissions and credits and provides supporting technical documentation. ARB will post the report on ARB's webpage. ARB will select the methodologies and self-monitor the Mitigation Monitoring and Reporting Program during the operations phase as described below in the 'Approach to Implementation on MM-GHG-2'.

If this is not successful, then and only then are carbon credits considered:²⁷

If the mitigation measures above do not reduce annual operational emission to zero, ARB may consider purchasing and retiring offsets from an accredited registry. As part of the Monitoring and Mitigation Reporting Program, ARB shall prepare a report that quantifies the emissions and credits and provides supporting technical documentation. ARB will post the report on ARB's webpage. ARB will select the methodologies and self-monitor the Mitigation Monitoring and Reporting Program during the operations phase as described below in the 'Approach to Implementation on MM-GHG-2'.

In contrast, the Newland Sierra DEIR does not set out any method to ensure that the assumed reductions are enforceable, beyond a transportation coordinator operating as part of a homeowner's association (PDF-20), with no requirement to measure or report to the CEQA lead agency.

At a minimum, the DEIR must include a detailed analysis of the effectiveness and likely implementation for each PDF and cannot merely assign CAPCOA credits that were intended to measure emissions reductions in more urban and mixed use (i.e., self-sustaining) areas.

1.1.3. Design Features Are Not Valid CEQA Mitigation

The operational GHG emission calculations assume the use of 32 Project design features to reduce GHG emissions by 18%.²⁸ These design features are listed in the Newland Sierra DEIR as measures PDF-1 to PDF-32.²⁹ Because mitigation measure M-GHG-3 categorizes these

²⁷ CARB, March 2017, Table 1-1, p. 1-22 and p. 5.7-47 ("If the mitigation measures above do not reduce annual operational emission to zero, ARB may consider purchasing and retiring offsets from an accredited registry.").

²⁸ Newland Sierra DEIR, p. 2.7-47.

²⁹ Newland Sierra DEIR, pp. 7-7 to 7-10.

design features as mitigation measures,³⁰ all CEQA requirements for mitigation measures must apply to each design feature, including requirements for certainty and enforceability. These requirements have not been met.

The DEIR does not provide any basis for the assumed GHG emission reductions for these 32 design features. The DEIR cites CAPCOA 2010 as the basis for the assumed GHG emission reductions.³¹ This document sets out complex formulae that can be used to calculate GHG emission reductions as a percentage of GHG emissions from vehicle miles traveled (VMT).³² However, GHG emissions from the Project arise from both increases in VMT as well as increases in the use of utilities, including water, natural gas, and electricity. The DEIR does not contain any calculations to support the assumed GHG emission reductions for any of the design features. Further, the DEIR is silent on how it converted reductions expressed in terms of VMT based on the cited CAPCOA 2010 document into reductions expressed as a percentage of total Project GHG emissions.

The DEIR also does not require any post-Project demonstration that the GHG reductions assumed for project design features are achieved in practice. Thus, the assumed reductions are not enforceable and therefore are not valid CEQA mitigation. Design features must be enforceable to serve as a basis for controlling GHG emissions—but they are not, because the DEIR does not include any pre- or post-Project method to confirm that the reductions will occur. Further, the various design features are ambiguous as they are based on coordinating and promoting without identifying a responsible party, identifying a funding source, or requiring any monitoring and reporting to the County.

Project design features must be made enforceable—as required, for example, by the Newhall Ranch GHG mitigation program—by requiring the applicant or its designee to submit building design plans to San Diego County for review and approval before construction begins. These plans must demonstrate that each project component complies with the design features relied on as GHG mitigation. The County shall hold the applicant or its designee accountable for meeting the criteria in PDF-1 to PDF-32 prior to issuing building permits. Further, prior to the issuance of building permits, the applicant or its designee shall establish and fund a dedicated account to implement the various subsidies and programs called for in the PDF design features.³³

³⁰ See, e.g., Newland Sierra DEIR, Table S-1, p. S.0-99; p. 2.7-47 (“Additionally, M-GHG-2 ensures the project design features will be implemented to further reduce potential GHG emissions.”); p. 2.7-51 (M-GHG-3: “To reduce GHG emissions, the project applicant () shall implement the project design features listed in EIR Table 2.7-7.”).

³¹ Newland Sierra DEIR, Greenhouse Gas Emissions Technical Report, June 2017, Table 15.

³² CAPCOA, Quantifying Greenhouse Gas Mitigation Measures, August 2010; available at https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/capcoa_quantifying_ghg_measures.pdf

³³ See, e.g., Newhall Ranch Draft Additional Environmental Analysis (Newhall DAEA), November 3, 2016, pp. 2-27/28 at pdf 58-59; available at <https://nrm.dfg.ca.gov/documents/ContextDocs.aspx?cat=NewhallRanchDraftAEA>

1.1.3.1. Design Feature PDF-1 (Land Use Diversity)

PDF-1 provides a 5% GHG credit for land use diversity. The basis for the assumed 5% is not disclosed or supported in the DEIR. Instead, it is simply asserted as a “land use strategy” that applies to vehicle miles traveled.³⁴ The Project contains a mere 81,000 square feet of neighborhood-serving commercial development in the Town Center³⁵ for 2,135 homes,³⁶ which is inadequate to meet the vast majority of residents’ commercial needs.

The proposed Specific Plan and land use designations allow for about 2,199 residential dwelling units and about 1,777,684 square feet of commercial use, or 808 square feet of commercial use per dwelling unit.³⁷ The Project, on the other hand, is providing only 38 square feet of commercial use per dwelling unit. The DEIR contains no evidence that such a low ratio of commercial to residential area warrants a 5% GHG credit.

Further, the commercial development will not occur until Phase 2, even though more than 1,800 of the proposed 2,135 homes will be constructed in Phase 1. Even if a land use diversity credit was warranted for this Project, the DEIR cannot provide a credit for the time period prior to the diversity of land uses being built out. Moreover, the Project Site layout spreads out across steep terrain with a circuitous internal road network, thus limiting the potential for alternative transportation. The proposed commercial site is about 2 miles away from the majority of residential units and is much more likely to cause added vehicle trips on Deer Springs Road from the units in the Valley, Summit, and Knoll neighborhoods (1,028 residential units total). Further, land use diversity credits should not be allowed for “park” use, which is required and assumed in residential areas, or a school “site” that has not even been committed to be used for a school and with no commitment as to which and how many of the students within the Project Site would be able to attend the school—particularly when the Project Site is proposed to be split between multiple school districts. In addition, the Town Center will attract traffic from nearby roadways, especially I 15, which has the potential to increase GHG emissions not otherwise accounted for.

Finally, the DEIR is silent on how compliance with the assumed 5% GHG emission reductions would be demonstrated. Thus, these measures are not enforceable and therefore not valid CEQA mitigation.

³⁴ Newland Sierra DEIR, Appendix D (VMT Reduction Measures and Reduction Calculations) of Appendix K (Greenhouse Gas Emissions Technical Report) of Appendix K, p. 19 of 26.

³⁵ Newland Sierra DEIR, pp. S.0-2, 1-2, 1-6, 1-25.

³⁶ Newland Sierra DEIR, p. 1-35.

³⁷ Newland Sierra DEIR, p. 1-35.

1.1.3.2. Design Features PDF-2 and -3 (Pedestrian and Bicycle Trails and Network)

These two design features would develop a comprehensive trails network and provide bicycle racks along main travel corridors. Additional bicycle facilities should be provided, including:

- sufficient short-term and long-term bicycle parking facilities to meet peak season maximum demand;
- “end-of-trip” facilities including showers, lockers, and changing space; and
- a designated bicycle route connecting all units, on-site bicycle parking facilities, off-site bicycle facilities, site entrances, and primary building entrances, to all streets contiguous with the Project site in order to minimize conflicts with automobile parking and circulation facilities.³⁸

The Newland Sierra DEIR assumed a 2% reduction in GHG emissions for these two measures. However, the DEIR fails to provide any support for the assumed 2% reduction in total GHG emissions. Further, the DEIR is silent on how compliance with the assumed 2% GHG emission reduction would be demonstrated. Thus, these measures are not enforceable and therefore are not valid CEQA mitigation.

1.1.3.3. Design Features PDF-4 to PDF-8 (Bike-, Car-, and Ride-Share Measures)

These four design features provide for an electric bike share program, a car share program, a local shuttle service, and ridesharing support features for residents. The DEIR assumed a total GHG emission reduction of 2.8% for these five measures. The DEIR is silent on how the assumed emission reductions were calculated, who would pay for them, and who would implement and operate these measures. The DEIR also does not provide any reporting or other method to assure the assumed reductions actually occur.

These measures appear to require funding from and participation by residents or another external source, after the Project is fully built out. Further, the DEIR is silent on how compliance with the assumed 2.8% GHG emission reduction would be demonstrated. Thus, these measures are not enforceable and therefore are not valid CEQA mitigation. At a minimum, the DEIR should include a feasibility study to determine the potential effectiveness of such measures given the remote location and local terrain and a cost comparison against other methods of transportation to determine whether such measures will even meet the threshold level to be funded and implemented by the residents.

³⁸ See, e.g., March Joint Power Authority (MJPA), Draft Environmental Impact Report for the Meridian West Campus-Lower Plateau Project, Prepared by Dudek, June 2017 (MJPA, June 2017), Table 4.6-5, p. 4.6-40; available at http://marchjpa.com/documents/docs_forms/deir_west.pdf

1.1.3.4. Design Feature PDF-9 (Provide Transit Subsidies for Residents)

This design feature provides a transit fare subsidy for residents. The DEIR assumed a total GHG emission reduction of 0.9% for this measure. However, emission reductions would only occur if the subsidies are used. The DEIR fails to demonstrate that residents would use transit, even if subsidies are provided. As already noted, the nearest transit station is over six miles away, suggesting demand for transit subsidies may not exist or would be much lower than assumed in the DEIR.

This design also lacks any specificity, including who will pay for the subsidy, how much the subsidy will be, whether there are any restrictions on qualifying for the subsidy or use of the subsidy (e.g., only for certain transit authorities or modalities), and who would secure and distribute the subsidies.

The DEIR is also silent on how the assumed emission reduction of 0.9% was calculated, who would secure the subsidies, how they would be distributed to residents, and how the County would confirm the subsidies were used to offset VMT. Thus, PDF-9 is not enforceable and therefore is not valid CEQA mitigation.

1.1.3.5. Design Feature PDFs 10-13, 20 (TDM Program Marketing for Residents)

These PDFs establish a marketing program for the TDM program to promote the various design features to reduce vehicle miles traveled. The Newland Sierra DEIR fails to fund and set up a non-profit Transportation Management Organization (TMO) or equivalent management entity with the authority and funding to provide the TDM services assumed in these mitigation measures.³⁹

Further, the transportation coordinator required by PDF-20 would not have the authority to require that residents partake of any of the design features offered to reduce VMT. Further, PDF-20 is not listed in Table 2.7-7 as a Project design feature to reduce GHG emissions.⁴⁰

The remote location of the Project and its steep terrain would discourage the use of design features to reduce VMT. Further, it is illogical to assume additional GHG emission reductions (0.5%) for marketing an ineffective tool. Because the underlying program is inadequate, as explained above, marketing it without any authority to require any of the measures does not warrant an additional 0.5% reduction in total GHG emissions.

The DEIR is also silent on how the assumed emission reduction of 0.5% for these marketing measures was calculated and how the County would confirm the marketing resulted

³⁹ Newhall DAEA, p. 2-28, pdf 59.

⁴⁰ Newland Sierra DEIR, Table 2.7-7, p. 2.7-60.

in an additional 0.5% reduction in total GHG emissions. Thus, PDF 10-13 and 20 are not enforceable and therefore are not valid CEQA mitigation.

1.1.3.6. Design Feature PDF 14 (Transit Subsidies)

This design feature provides a transit fare subsidy for employees of the Town Center. It is not valid CEQA mitigation for the same reasons as PDF 9, which provides subsidies for residents. See Comment 1.1.3.5.

1.1.3.7. Design Features PDF 15-19 (TDM Program Marketing for Employees)

These design features provide a credit for marketing the Project's TDM program for employees and fails for the same reasons as PDFs 10-13. See Comment 1.1.3.5.

1.1.3.8. Design Features PDF-21-32 (Other Project-Specific Reduction Features)

The Newland Sierra DEIR identifies other design features that are included in the Project, but for which no GHG emission reductions were claimed. These measures include greywater systems, minimization of stormwater runoff, green waste collection, productive landscapes, cool roofs, and energy-efficient appliances.⁴¹ The DEIR does not require that these measures actually be installed and used. For example, PDF-26 indicates that all single-family homes "shall be plumbed for greywater systems for use in private yards."⁴² However, the DEIR does not require that these greywater systems be used, nor require them for multi-family and senior adult homes. Other EIRs require that these measures be "used."⁴³ Similarly, PDF-31 allows builders to "offer" residents their choice of energy-efficient appliances but does not provide for financial incentives, as required in other EIRs.⁴⁴

These and other similar measures identified below should be specifically required as feasible GHG mitigation and made enforceable by requiring monitoring and reporting to assure they are installed and operated. However, any attempt to quantify emissions reductions from PDFs 21-32 would require recirculation of the DEIR for the public to analyze the effectiveness of such PDFs as mitigation measures under M-GHG-3.⁴⁵

⁴¹ Newland Sierra DEIR, Table 2.7-7, p. 2.7-61.

⁴² Newland Sierra DEIR, p. 7-10.

⁴³ MJPA, June 2017, pp. 4.6-33/34 ("Modest cool roof **will be constructed**"; "Waterless urinals and high efficiency toilets **will be used throughout**"; "Water efficient faucets **will be used throughout**"; Greywater (purple pipe) irrigation system **will be used** for outdoor water").

⁴⁴ SLAFC, December 2017, Table ES-1, p. ES-30 ("Provide incentives to future residents to purchase EnergyStar™ appliances.").

⁴⁵ *Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal. 4th 1112, 1120 (recirculation "required when the information added to the EIR changes the EIR in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of

In addition, other similar building envelope and facility operation measures are feasible and should also be required. These include:^{46,47,48,49}

- Require bus stops, express lanes, and bus stop shelters for existing/ planned transit service;
- Energy use should be reported compared to targets set on per-capita energy use;
- Use of traffic calming measures including all internal sidewalks a minimum 5 feet wide, all sidewalks with vertical curbs, roadways routed to avoid “skewed intersections”;
- Internal and adjacent intersections should use the following traffic-calming features: marked crosswalks, count-down signal times, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles;
- Applicant shall participate in funding of off-site traffic improvements to reduce idling by increasing traffic flow through synchronized traffic signals;⁵⁰ Internal and adjacent streets should use the following traffic-calming features: planter strips with trees, chicanes/chokers (variations in road width to discourage high-speed travel);
- Provide preferential parking for park and ride to incentivize carpooling, vanpooling, commuter bus, and electric vehicles;
- Require “cool parking” by, for example, providing tree cover to reduce heat-island effect;
- Provide storage space in garages for bicycles and bicycle trailers;
- Provide preferential parking for EV/CNG vehicles;
- Provide residential buildings with a “utility” room or space for recharging batteries – e.g., for use in a car, electric lawnmower, other electric landscaping equipment, and batteries for small items;
- Provide a complimentary electric lawnmower to each buyer with a yard;
- Use only drought-resistant native trees, trees with low emissions and high carbon sequestration potential;⁵¹

the project or a feasible project alternative or mitigation measure that would clearly reduce such an effect and that the project’s proponents have declined to implement.”).

⁴⁶ CAPCOA 2008, Appendix B, Table 16, pp. B-1 to B-31.

⁴⁷ SLAFC, December 2017.

⁴⁸ MJPA, June 2017, Table 4.6-5, p. 4.6-43.

⁴⁹ SLAFC, December 2017, Table ES-1.

⁵⁰ MJPA, June 2017, Table 4.6-5, p. 4.6-43, Policy 6.1.

⁵¹ MJPA, June 2017, p. 4.6-34 (“water efficient landscaping: No turf; only drought tolerant plants”). The Newland Sierra DEIR allows warm-season turf grass in rear and side yards of single-family homes. (PDF-25).

- Use water-efficient irrigation systems, i.e., smart sprinkler meters, and landscaping techniques/design;
- Dedicate space in a centralized, accessible location for a weekly farmers' market;
- Orient building to maximize shade in the summer and maximize solar access to walls and windows in the winter;
- For non-roof surfaces, provide shade and/or use light-colored/high-albedo materials and/or open grid pavement for at least 30% of the site's nonroof impervious surfaces, including parking lots, walkways, plazas, etc., or place a minimum of 50% of parking spaces underground or covered by structured parking or use an open-grid pavement system for a minimum of 50% of the parking lot area;
- Require organic waste collection;
- Require the installation and use of low-water use faucets, toilets, shower heads, and appliances that exceed CALGreen residential voluntary measures; and
- Implement CALGreen Tier 2 standards or better.⁵²

1.1.4. All Feasible On-Site Solar Not Required

The Newland DEIR assumed that 6.5% of Newland Sierra's GHG reductions would be achieved through on-site solar.⁵³ The DEIR asserts the Project would be designed to include solar photovoltaic panels for all single-family and multi-family residential development, sufficient to offset 100% of the residential structural electricity demand, excluding water demand.⁵⁴ The Newland DEIR variously estimated this would reduce GHG emissions from generation of electricity to support the Project by 3,453 MT CO₂E/yr⁵⁵ to 3,737 MT CO₂E/yr⁵⁶ or by about 6.5%. There are several problems with this assumed reduction in GHG emissions.

First, the Newland DEIR does not require the **use** of solar panels to generate on-site electricity, but only the installation of panels. There is no requirement in the DEIR to confirm that this design feature has been satisfactorily implemented and achieves the assumed GHG reductions. The DEIR cannot rely on solar panels to reduce GHG emissions from electricity use unless accompanied by an enforceable mitigation measure and sufficient design information to demonstrate feasibility, given site constraints.

Second, no analysis is provided to support the potential to generate 100% of the on-site electricity demand from on-site solar. On-site solar panels, absent storage options, may not be

⁵² Newland Sierra DEIR, p. 2.7-19.

⁵³ Newland Sierra DEIR, pp. 2.7-41, 3.1-12 to 3.1-13.

⁵⁴ Newland Sierra DEIR pp. 3.1-12 to 3.1-13.

⁵⁵ Newland Sierra DEIR, p. 2.7-41.

⁵⁶ Newland Sierra DEIR, Table 2.7-6, p. 2.7-57.

able to offset 100% of the electrical demand. The failure to use 100% solar in residential units would increase GHG emissions from electricity generation by 3,453 to 3,737 MT CO₂E/yr.⁵⁷ The DEIR should have evaluated all feasible renewable energy options, including geothermal, acquisition of additional land in the vicinity to install the needed PV panels, and entering into a long-term (20-year minimum) purchase agreement for renewable energy in which the provider is contractually bound to retire the Renewable Energy Credits (RECs) associated with the renewable energy on CARB's behalf.⁵⁸

Third, the DEIR does not contain any design/development details to ensure that roofs can accommodate solar (e.g., they could be too steep or improperly oriented). The DEIR is also silent on how the multi-family units would be designed to accommodate solar.

Fourth, the DEIR assumes that street lighting would be solar powered but fails to require solar panels to satisfy this electrical demand or otherwise explain how solar street lighting would be made enforceable.⁵⁹

Fifth, the DEIR is silent as to electrical demand and mitigation for landscaping and maintenance equipment, such as blowers and lawn mowers. These are frequently gas powered. A mitigation measure should be added requiring electrical landscaping equipment and exterior electrical outlets to allow sufficient powering.⁶⁰

The DEIR should be modified to prohibit the use of electricity from off-site sources and to specifically require the use of on-site solar as mitigation, sufficient to supply 100% of the on-site electricity demand, as assumed in the GHG emission calculations. Absent an enforceable requirement to use solar for 100% of on-site residential electrical demand, the DEIR must include all feasible mitigation for GHG emissions from residential electrical demand. Further, the DEIR must demonstrate that 100% solar is feasible by providing design details of the single and multifamily units showing how solar panels will be integrated.

1.1.5. The DEIR Fails to Mitigate GHG Emissions from Natural Gas Use

The Newland Sierra Specific Plan stated the “project will increase demand for natural gas and electricity...”⁶¹ GHG emissions from electricity use are mitigated using on-site solar panels, discussed in Comment 1.1.4. However, no mitigation at all is proposed for GHG emissions from natural gas use, which contributes 4.7% of the GHG emissions.⁶² Mitigated

⁵⁷ Newland Sierra DEIR, p. 2.7-41.

⁵⁸ See, e.g., CARB, March 2017, Table 1-1, p. 1-2.

⁵⁹ Newland Sierra Specific Plan, p. 258 (“solar-powered street lights”).

⁶⁰ See, e.g., SLAFC, December 2017, Table ES-1, pp. ES-31, ES-36 (“provide electrical outlets on the exterior of project buildings to allow sufficient powering of electric landscaping equipment.”).

⁶¹ Newland Sierra Specific Plan, p. 51.

⁶² Newland Sierra DEIR, Table 2.7-6, p. 2.7-57.

GHG emissions equal unmitigated GHG emissions, indicating that the DEIR does not include any mitigation at all for GHG emissions from using natural gas.⁶³

The increased demand in natural gas use is for building heating, water heating, and cooking associated with the residential, commercial, and school land uses at the Project site.⁶⁴ Table 1⁶⁵ indicates that the majority of the natural gas is used within on-site housing:

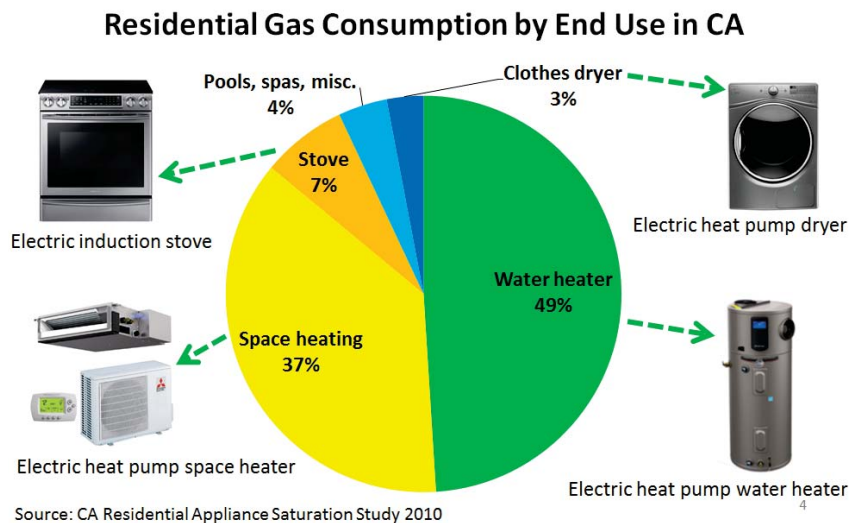
Table 1
Estimated Natural Gas Demand

Component	Estimated Natural Gas Demand (kBTU/yr)
Commercial	181,440
School	196,020
Parks	0
Age-Qualified Housing	4,662,660
Multi-Family Housing	15,983,800
Single-Family Housing	24,931,000
Total	45,954,920

Source: Appendix K; CalEEMod 2013

Residential gas consumption for age-qualified, multi-family, and single-family housing is responsible for 99% of the projected gas use. These emissions can be significantly reduced by requiring all-electric housing, commercial, and school energy uses. Residential gas consumption, for example, can be eliminated by requiring electrified housing, as summarized in Figure 1.

Figure 1
Methods to Electrify Housing



⁶³ Newland Sierra DEIR, Table 2.7-8 (GHG emissions from natural gas consumption = 2,452 MT/yr) compared to Table 2.7-6 (GHG emissions from natural gas consumption = 2,452 MT/yr).

⁶⁴ Newland Sierra DEIR, p. 3.1-13, Table S-2, pdf-32 (“All fireplaces would be natural-gas-fired.”), p. 1-15, PDF-32 (“All fireplaces would be natural-gas-fired.”).

⁶⁵ Newland Sierra DEIR, Table 3.1-2.

GHG emissions from electricity are now lower than from natural gas. Further, GHG emissions from electricity can be fully mitigated by requiring on-site solar panels. Technology is available today to replace all gas appliances with efficient electric appliances. The increase in electricity demand from electrifying housing could be fully offset by using on-site solar panels designed to handle the resulting increase in electrical load. California home builders, such as City Ventures⁶⁶ and KB Homes, have begun building homes without gas lines, replacing gas central heating, hot water and stoves with electric appliances. See, for example, the new solar all-electric homes already built in San Diego County⁶⁷ and elsewhere:^{68,69}



Eliminating residential gas use eliminates the need to install gas pipelines under streets and inside homes, reducing home costs as well as construction GHG and criteria pollutant emissions. Electrification not only achieves significant GHG reductions, it also improves indoor air quality and safety by removing a flammable material from living areas. Improved safety is an important benefit in earthquake- and fire-prone areas such as the Project site.⁷⁰

Figure 1 indicates that 86% of the residential gas consumption is for heating. GHG emissions from water heating, comprising 49% of the natural gas consumption, can be completely eliminated by requiring the use of high-efficiency heat pumps. These pumps pull in heat from ambient air, compress the air to increase its temperature, and route the resulting heat through a condenser coil to transfer heat to water in a tank. This is much more efficient than gas and electric resistance heating. Alternatively, solar water heaters could be used.

⁶⁶ City Ventures Residences; available at <https://www.cityventures.com/balanced-power-solar-and-gas/>

⁶⁷ Chula Vista, Vista Mar; available at <https://www.cityventures.com/chula-vista/>

⁶⁸ City Ventures; available at <https://www.cityventures.com/balanced-power-solar-and-gas/>

⁶⁹ KB Homes; available at <https://www.kbhome.com/energy-efficient-homes>

⁷⁰ David Hochschild and Mark Ferron, California's Next Frontier: Clean Electricity for Everything, May 20, 2016; available at <https://www.sfchronicle.com/opinion/article/California-s-next-frontier-clean-electricity-7872652.php>

1.1.6. Electric Vehicle (EV) Charging Equipment

The Project would also include electric vehicle (EV) charging equipment in the garages of all single-family residential units⁷¹ and in 3% of the Town Center's commercial core parking spaces. Further, the applicant would be "encouraged" to install EV charging stations in 3% of the park-and-ride parking spaces.⁷² This does not constitute all feasible GHG mitigation achievable by EV charging equipment.

First, the Newland Sierra DEIR fails to require the **use** of this EV charging equipment. EV charging stations would only offset GHG emissions if Newland Sierra occupants and visitors were required to use battery electric vehicles (BEVs). Plug-in hybrid electric vehicles (PHEVs) can drive in gasoline mode and thus would not satisfy the assumed GHG reductions. Absent a requirement to only allow BEVs in all garages and parking spaces, the charging stations would not reduce GHG emissions. Newland Sierra should offer subsidies to residents, schools, and bus services to buy zero-emission vehicles to facilitate the use of the EV charging equipment.

Second, the charging stations themselves use electricity. The DEIR is silent on GHG emissions from supplying electricity for the charging stations. The DEIR should be modified to require the use of solar-powered charging stations.

Third, the DEIR only requires EV charging stations in the garages of all single-family homes. The DEIR should be modified to require EV charging stations for multi-family units, which comprise 995 of the Project's total of 2,135 residential units.⁷³

Fourth, the DEIR only requires EV charging at 3% of its commercial center parking spaces.⁷⁴ The DEIR must require all feasible mitigation. Thus, it should be modified to require EV charging at 100% of its commercial center parking.

Fifth, the DEIR only "encourages" EV charging at 3% of the park-and-ride parking spaces. The DEIR should be modified to require EV charging at 100% of the park-and-ride parking spaces.

Sixth, the DEIR fails to include any off-site EV charging stations beyond the park-and-ride chargers. There are numerous nearby opportunities for off-site charging stations that should be required in lieu of generic, undefined future GHG offsets. The Newhall EIR, for example, requires that before the issuance of the first building permit, the applicant must provide proof of installation of off-site EV charging stations capable of serving 20 off-site parking spaces. Thereafter, the applicant must provide proof of installation of EV charging stations prior to issuance of a building permit per the following ratios: one off-site parking

⁷¹ Newland Sierra Specific Plan, p. 131 ("Single-family homes shall include an electric vehicle charger in the garage").

⁷² Newland Sierra DEIR, p. 2.7-38.

⁷³ Newland Sierra Specific Plan, Table 3.

⁷⁴ Newland Sierra Specific Plan, p. 125.

space shall be served by an electric vehicle charging station for every 30 dwelling units and one off-site parking space shall be serviced by an EV charging station for every 7,000 square feet of commercial development. EV charging stations capable of servicing 2,036 parking spaces would be required if the maximum allowable development occurs.⁷⁵

Finally, the DEIR cannot rely on EV charging stations to reduce GHG emissions unless accompanied by an enforceable mitigation measure and sufficient design information to demonstrate feasibility, given site constraints. In the Newhall EIR, for example, building permits are contingent on demonstration of proof of installation of EV charging stations.⁷⁶ The CARB Southern California Consolidation EIR requires the mitigation to be quantified and supported by technical documentation in a report submitted as part of the Mitigation Monitoring and Reporting Program, using an approved methodology demonstrating the reductions are valid.⁷⁷

1.1.7. Building Energy Efficiency

The GHG emission calculations assume reductions from complying with the 2016 Title 24 standards or future, more stringent versions of Title 24 that are applicable to the land uses at buildout, predicting net zero efficiency mandates for residential building will be in effect when the first homes are constructed. However, Newland Sierra will only comply with net zero building efficiency if and when implemented. It is not required as mitigation and thus is not enforceable on the Applicant. However, building Newland Sierra to achieve net zero efficiency is feasible today and should be required as enforceable mitigation.

1.1.8. Traffic Signal Synchronization

The Newland Sierra DEIR states that improvements will be made to off-site traffic signals and signal timing to mitigate traffic impacts, as part of the GHG Reduction Climate Change Action Plan.⁷⁸ These improvements are relied upon to reduce GHG emissions. However, traffic signalization is not required as enforceable mitigation. Further, the DEIR does not contain any details on the proposed signalization. Therefore, traffic signalization is not enforceable mitigation for GHG impacts.

The DEIR should be modified to specifically require that the applicant or its designee submit traffic signal plans for review and approval to the County and Caltrans and pay any needed fees. The DEIR should state that the Project is responsible for paying 100% of the applicable cost of the signal synchronization work, with assurance that the necessary funding will be available to fully implement this measure, prior to issuing traffic signal permits. Issuance of traffic signal permits shall be contingent on the applicant providing adequate

⁷⁵ Newhall DAEA, pp. 2-31/32, pdf 62-63: Mitigation Measure 2-12: Off-Site Electric Vehicle Chargers.

⁷⁶ Newhall DAEA, pp. 2-31/32.

⁷⁷ CARB, March 2017, Table 1-1, p. 1-21.

⁷⁸ Newland Sierra DEIR, p. 2.17-30 (CC-1.5).

evidence that the mitigation will be implemented as assumed in the GHG emission calculations.⁷⁹

1.1.9. Zero-Emission Buses

The DEIR is silent on zero-emission buses for local school and general transit, a feasible mitigation measure that must be required as mitigated GHG impacts are significant, requiring all feasible mitigation.

The Project site will include a 6-acre school site and its residents will attend nearby schools.⁸⁰ These schools are served by school buses. The EIR should require that Newland Sierra fund zero-emission school and other transit buses that serve unincorporated areas of San Diego County. The DEIR, for example, should require that the Project applicant or its designee provide the County with proof that funding has been provided for the purchase, operation and maintenance of electric school and other buses. The proof of funding shall be demonstrated incrementally, paced to keep up with occupancy and enrollment levels.⁸¹

Further, many transit bus fleets are currently operating zero-emission buses in California.⁸² Twelve major cities – including London, Paris, Los Angeles, and Cape Town – have recently committed to buying only zero-emission buses from 2025 and to making major areas free of fossil fuel emissions by 2030.⁸³ The Los Angeles County Metropolitan Transportation Authority has announced it will eliminate emissions from its 2,300 bus fleet by replacing its existing fleet with buses that run on electric batteries or other forms of zero-emission power.⁸⁴

The Newhall Ranch Resource Management and Development Plan, for example, includes an electric transit bus program. This program requires the applicant or its designee to provide Los Angeles County with proof that it has provided a subsidy of \$100,000 per bus for the replacement of up to 10 diesel or compressed natural gas transit buses with electric buses. This measure is feasible and enforceable because the applicant must provide the subsidy in advance of securing the building permits.⁸⁵

⁷⁹ Newhall DAEA, p. 2-29, pdf 60, Mitigation Measure 2-7: Traffic Signal Synchronization.

⁸⁰ Newland Sierra DEIR, pp. S.0-2, 1-2, 1-6, 1-23 to 1-24, 1-37, Table 1-10, Figure 1-33.

⁸¹ Newhall DAEA, p. 2-29, pdf 60, Mitigation Measure 2-8, Electric School Bus Program.

⁸² CARB, Advanced Clean Transit, May 2015, pp. 5, 6; available at <https://www.arb.ca.gov/msprog/bus/workshoppresentation.pdf>

⁸³ Alister Doyle, Twelve Big Cities to Buy Zero Emissions Buses, Extend Green Areas, Reuters, October 23, 2017; available at <https://www.reuters.com/article/us-climatechange-cities/twelve-big-cities-to-buy-zero-emissions-buses-extend-green-areas-idUSKBN1CS13I>

⁸⁴ Laura J. Nelson, L.A. Metro Wants to Spend \$138 Million on Electric Buses. The Goal: An Emission-free Fleet by 2030, Los Angeles Times, July 21, 2017; available at <http://www.latimes.com/local/lanow/la-me-ln-metro-electric-buses-20170721-story.html>

⁸⁵ Newhall DAEA, p. 2-30, pdf 61, Mitigation Measure 2-9: Electric Transit Bus Program.

1.1.10. Swimming Pool Heating

Swimming pools may be constructed on residential lots at a homeowner's discretion, either as part of the primary purchase or after the house has been constructed and sold. The Applicant has estimated that no more than half of the lowest-density lots (2 to 4 dwelling units per acre) and no more than one-quarter to one-third of the next lowest-density lots (4 to 8 dwelling units per acre) are likely to have pools installed. Further, pools will be installed in three community parks.⁸⁶

The GHG emission calculations do not include any emissions from pool heating nor any mitigation for these emissions. These emissions can be mitigated by requiring electric heating for swimming pools, provided by on-site solar panels. The Newhall Ranch Resource Management and Development Plan, for example, requires design plans that demonstrate that all swimming pools on the project site have been designed and constructed to use solar water heating or other technology with an equivalent level of energy efficiency.⁸⁷

1.1.11. Electric Vehicle and Other Subsidies

The Newland Sierra DEIR provides EV chargers, but does not require their use or provide any incentives for residents to purchase and use them. The Newhall EIR includes a mitigation measure that establishes a fund dedicated to providing subsidies for the purchase of EVs. The dedicated account must incrementally fund, for each project, a subsidy of \$1,000 per residence, on a first-come, first-served basis, for 50% of the total residences.⁸⁸ The developer of the Newhall Ranch subsidy program, for example, will provide more than \$21.5 million for residents and bus providers to buy electric vehicles, electric school and city buses and electric bikes as part of the bike-share program.⁸⁹ The Bilby Ridge DEIR provides incentives to future residents to purchase EnergyStar™ appliances (including clothes washers, dishwashers, fans, and refrigerators).

1.2. Construction GHG Mitigation

The Newland Sierra Project would be constructed in two phases over 10 years. Phase I includes roadway improvements, installation of on-site water tanks, and construction of five neighborhoods. Phase 2 includes Camino Mayor improvements, two additional residential neighborhoods, and the Town Center.

⁸⁶ Technical Memorandum from John Porcello, GSI Water Solutions, Inc., to Rita Brandin, Newland Sierra, LLC, Re: Water Conservation Demand Study for the Newland Sierra Specific Plan and EIR, December 20, 2016, p. 15 and Table 11.

⁸⁷ Newhall DAEA, p. 2-26, pdf 57: Mitigation Measure 2-3: Swimming Pool Heating.

⁸⁸ Newhall DAEA, p. 2-27, pdf 58: Mitigation Measure 2-4: Residential Electric Vehicle Chargers and Vehicle Subsidy.

⁸⁹ Newhall DAEA, p. 2-27, Mitigation Measure 2-4: Residential Electric Vehicle Chargers and Vehicle Subsidy; Jeff Collins, Working Toward a 'Net Zero' Community, Orange County Register, December 3, 2017; available at <https://www.ocregister.com/2017/12/03/working-toward-a-net-zero-community/>

The Newland DEIR estimated that construction of the Project would emit 93,323 MT CO₂E/yr, resulting in a potentially significant impact, labeled impact GHG-1.⁹⁰ The only mitigation required for these GHG emissions is M-GHG-1, which proposes to mitigate impacts from construction and vegetation removal emissions through an offset program that does not have any locational requirements or direct investment requirements.

This proposed offset program has all of the flaws previously discussed for the operational GHG offset program in Comment 1.1. Thus, the proposed construction offset program is inconsistent with CEQA and is not valid mitigation for the Project's construction GHG emission increases. CEQA mitigation must provide certainty that the reductions will occur, that the claimed reductions are enforceable, and that the mitigation measures do not create additional impacts.

Further, even assuming the offset program were valid CEQA mitigation, which it is not, the Newland Sierra DEIR significantly underestimated construction GHG emissions as discussed in my 8/14/17 comments. Thus, the offset program will not mitigate the significant increases in construction GHG emissions.

1.2.1. On-Site Mitigation Must Be Required for Construction Emissions

Other agencies have established on-site mitigation measures to reduce GHG emissions from construction. Most of these measures have been required as CEQA mitigation for construction impacts in other EIRs.^{91,92,93,94,95,96} These measures generally involve:

- reducing fuel use,
- enforcing idling time, including for delivery and construction vehicles (limited to 2 minutes),
- limiting and enforcing vehicle speed on unpaved roads to 15 mph,
- equipment maintenance checked by a certified visible emission evaluator,
- driver training,

⁹⁰ Newland Sierra DEIR, p. 2.7-34.

⁹¹ Chevron Refinery Modernization Project Final EIR, Revisions to Draft EIR Volumes 1 & 2, June 2014, pp. 4-25 to 4-28 (Chevron FEIR); available at https://s3.amazonaws.com/chevron/Final+EIR/Volume+3_Final+EIR.pdf

⁹² Peter Truitt, Potential for Reducing Greenhouse Gas Emissions in the Construction Sector, February 2009; available at <https://archive.epa.gov/sectors/web/pdf/construction-sector-report.pdf>

⁹³ The World Bank, Greenhouse Gas Emissions Mitigation in Road Construction and Rehabilitation, November 2010; available at http://siteresources.worldbank.org/INTEAPASTAE/Resources/ROADEO_User_Manual.pdf

⁹⁴ CAPCOA 2008, Appendix B, Table 16, pp. B-31 to B-32.

⁹⁵ SLAFC, December 2017, Table ES-1, p. ES-29.

⁹⁶ CARB, March 2017, Section 5.7.6.

- requiring construction vehicles to operate with the highest tier engines commercially available,
- using properly sized equipment,
- replacing or repowering older, less fuel-efficient equipment with newer models,
- using alternative fueled (e.g., biofuels, electric) engines for trucks and non-road equipment,
- using alternatives to diesel generators, such as dual-fuel generators that use a mix of natural gas or propane and diesel,
- using existing grid power for electric energy rather than operating temporary gasoline/ diesel powered generators,
- requiring diesel equipment fleets to be lower emitting than any current emission standard,
- reducing employee commuting,
- conserving electricity,
- recycling and reusing wastes from construction,
- selecting construction materials with lower environmental impacts,
- using labor intensive techniques for excavation,
- using high modulus asphalt concrete for roads,
- using warm and half-warm asphalt mixes,
- recycling/reusing at least 50% of construction waste or demolition materials (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard),
- using gravel roads and surface treatment instead of bituminous/cement concrete pavements,
- taking maintenance into account during design,
- using locally-sourced building materials with a high recycled material content to the greatest extent feasible, but at least 10%,
- minimizing tree removal,
- using fly ash in concrete, and
- ensuring recycling of steel.

The Chevron EIR further required that Chevron hire, at commercially reasonable rates and at Chevron's expense, a qualified third-party entity acceptable to the City of Richmond to quantify and verify in writing whether the reductions achieved from its construction mitigation plan adequately mitigated the project's potentially significant GHG impact. The report "shall be subject to City's reasonable approval." For any year in which construction emissions are not reduced below the GHG significance threshold, Chevron was required to reduce emissions from other equipment at the refinery or permanently retire or retrofit from diesel to electric power, one or more facility sources that emit more than 300 MT CO₂E/yr.⁹⁷ Similarly, the CARB Southern California Consolidation Project DEIR requires CARB to prepare a report that

⁹⁷ Chevron FEIR, p. 4-25.

quantifies the emissions and credits and provides supporting technical documentation, and to post the report on CARB's webpage.⁹⁸

Further, the Sacramento Metropolitan Air Quality Management District (SMAQMD) specifically lists the following feasible on-site construction GHG mitigation measures:⁹⁹

- Improve fuel efficiency from construction equipment:
 - Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 3 minutes (5 minute limit is required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site.
 - Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
 - Train equipment operators in proper use of equipment.
 - Use the proper size of equipment for the job.
 - Use equipment with new technologies (repowered engines, electric drive trains).
- Perform on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines).
- Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power.
- Use an ARB approved low carbon fuel for construction equipment. (*NOx emissions from the use of low carbon fuel must be reviewed and increases mitigated.*)
- Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.
- Reduce electricity use in the construction office by using compact fluorescent bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones.
- Recycle or salvage non-hazardous construction and demolition debris (goal of at least 75% by weight).

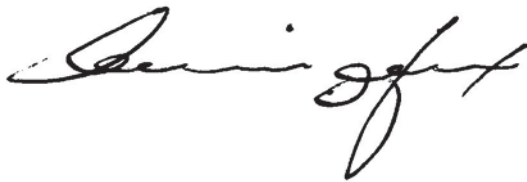
⁹⁸ CARB, March 2017, pp. 5.7-45/46.

⁹⁹ Sacramento Metropolitan Air Quality Management District (SMAQMD, Guidance for Construction GHG Emissions Reduction, CEQA Guide, December 2009, Revised September 2010, May 2016; available at <http://www.airquality.org/LandUseTransportation/Documents/Ch6ConstructionMitMeasuresFINAL5-2016.pdf>

- Use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, sidewalk and curb materials). Wood products utilized should be certified through a sustainable forestry program.
- Minimize the amount of concrete for paved surfaces or utilize a low carbon concrete option.
- Produce concrete on-site if determined to be less emissive than transporting ready mix.
- Use SmartWay certified trucks for deliveries and equipment transport.
- Develop a plan to efficiently use water for adequate dust control.

In addition, the DEIR should require the use of established criteria for the selection of sustainable on-site construction equipment.¹⁰⁰

Sincerely,

A handwritten signature in black ink, appearing to read "Phyllis Fox". The signature is fluid and cursive, with a large, stylized initial 'P'.

Phyllis Fox, Ph.D., PE

¹⁰⁰ M. Waris et al., Criteria for the Selection of Sustainable Onsite Construction Equipment, International Journal of Sustainable Built Environment, v. 3, issue 1, June 2014, pp. 96-110; available at <https://www.sciencedirect.com/science/article/pii/S221260901400034X>

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Dr. Fox has over 40 years of experience in the field of environmental engineering, including air pollution control (BACT, BART, MACT, LAER, RACT), greenhouse gas emissions and control, cost effectiveness analyses, water quality and water supply investigations, hydrology, hazardous waste investigations, environmental permitting, nuisance investigations (odor, noise), environmental impact reports, CEQA/NEPA documentation, risk assessments, and litigation support.

EDUCATION

Ph.D. Environmental/Civil Engineering, University of California, Berkeley, 1980.

M.S. Environmental/Civil Engineering, University of California, Berkeley, 1975.

B.S. Physics (with high honors), University of Florida, Gainesville, 1971.

REGISTRATION

Registered Professional Engineer: Arizona (2001-2014; #36701; retired), California (2002-present; CH 6058), Florida (2001-2016; #57886; retired), Georgia (2002-2014; #PE027643; retired), Washington (2002-2014; #38692; retired), Wisconsin (2005-2014; #37595-006; retired)
Board Certified Environmental Engineer, American Academy of Environmental Engineers, Certified in Air Pollution Control (DEE #01-20014), 2002-2014; retired)
Qualified Environmental Professional (QEP), Institute of Professional Environmental Practice (QEP #02-010007, 2001-2015: retired).

PROFESSIONAL HISTORY

Environmental Management, Principal, 1981-present

Lawrence Berkeley National Laboratory, Principal Investigator, 1977-1981

University of California, Berkeley, Program Manager, 1976-1977

Bechtel, Inc., Engineer, 1971-1976, 1964-1966

PROFESSIONAL AFFILIATIONS

American Chemical Society (1981-2010)

Phi Beta Kappa (1970-present)

Sigma Pi Sigma (1970-present)

Who's Who Environmental Registry, PH Publishing, Fort Collins, CO, 1992.

Who's Who in the World, Marquis Who's Who, Inc., Chicago, IL, 11th Ed., p. 371, 1993-present.

Who's Who of American Women, Marquis Who's Who, Inc., Chicago, IL, 13th Ed., p. 264, 1984-present.

Who's Who in Science and Engineering, Marquis Who's Who, Inc., New Providence, NJ, 5th Ed., p. 414, 1999-present.

Who's Who in America, Marquis Who's Who, Inc., 59th Ed., 2005.

Guide to Specialists on Toxic Substances, World Environment Center, New York, NY, p. 80, 1980.

National Research Council Committee on Irrigation-Induced Water Quality Problems (Selenium), Subcommittee on Quality Control/Quality Assurance (1985-1990).

National Research Council Committee on Surface Mining and Reclamation, Subcommittee on Oil Shale (1978-80)

REPRESENTATIVE EXPERIENCE

Performed environmental and engineering investigations, as outlined below, for a wide range of industrial and commercial facilities including: petroleum refineries and upgrades thereto; reformulated fuels projects; refinery upgrades to process heavy sour crudes, including tar sands and light sweet crudes from the Eagle Ford and Bakken Formations; petroleum, gasoline and ethanol distribution terminals; coal, coke, and ore/mineral export terminals; LNG export, import, and storage terminals; crude-by-rail projects; bioenergy facilities; shale oil plants; crude oil/condensate marine and rail terminals; coal gasification and liquefaction plants; oil and gas production, including conventional, thermally enhanced, hydraulic fracking, and acid stimulation techniques; underground storage tanks; pipelines; compressor stations; gasoline stations; landfills; railyards; hazardous waste treatment facilities; nuclear, hydroelectric, geothermal, wood, biomass, waste, tire-derived fuel, gas, oil, coke and coal-fired power plants; transmission lines; airports; hydrogen plants; petroleum coke calcining plants; coke plants; activated carbon manufacturing facilities; asphalt plants; cement plants; incinerators; flares; manufacturing facilities (e.g., semiconductors, electronic assembly, aerospace components, printed circuit boards, amusement park rides); lanthanide processing plants; ammonia plants; nitric acid plants; urea plants; food processing plants; wineries; almond hulling facilities; composting facilities; grain processing facilities; grain elevators; ethanol production facilities; soy bean oil extraction plants; biodiesel plants; paint formulation plants; wastewater treatment plants; marine terminals and ports; gas processing plants; steel mills; iron nugget production facilities; pig iron plant, based on blast furnace technology; direct reduced iron plant; acid regeneration facilities; railcar refinishing facility; battery manufacturing plants; pesticide manufacturing and repackaging facilities; pulp and paper mills; olefin plants; methanol plants; ethylene crackers; alumina plants, desalination plants; selective catalytic reduction (SCR) systems; selective noncatalytic reduction (SNCR) systems; halogen acid furnaces; contaminated property redevelopment projects (e.g., Mission Bay, Southern Pacific Railyards, Moscone Center expansion, San Diego Padres Ballpark); residential developments; commercial office parks, campuses, and shopping centers; server farms; transportation plans; and a wide range of mines including sand and gravel, hard rock, limestone, nacholite, coal, molybdenum, gold, zinc, and oil shale.

EXPERT WITNESS/LITIGATION SUPPORT

- For the California Attorney General, assist in determining compliance with probation terms in the matter of *People v. Chevron USA*.
- For plaintiffs, assist in developing Petitioners' proof brief for *National Parks Conservation Association et al v. U.S. EPA, Petition for Review of Final Administrative Action of the U.S. EPA*, In the U.S. Court of Appeals for the Third Circuit, Docket No. 14-3147.
- For plaintiffs, expert witness in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1997-2000) at the Cemex cement plant in Lyons, Colorado. Reviewed produced documents, prepared expert and rebuttal reports on PSD applicability based on NOx emission calculations for a collection of changes considered both individually and collectively. Deposed August 2011. *United States v. Cemex, Inc.*, In U.S. District Court for the District of Colorado (Civil Action No. 09-cv-00019-MSK-MEH). Case settled June 13, 2013.
- For plaintiffs, in civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1988 – 2000) at James De Young Units 3, 4, and 5. Reviewed produced documents, analyzed CEMS and EIA data, and prepared netting and BACT analyses for NOx, SO2, and PM10 (PSD case). Expert report February 24, 2010 and affidavit February 20, 2010. *Sierra Club v. City of Holland, et al.*, U.S. District Court, Western District of Michigan (Civil Action 1:08-cv-1183). Case settled. Consent Decree 1/19/14.
- For plaintiffs, in civil action alleging failure to obtain MACT permit, expert on potential to emit hydrogen chloride (HCl) from a new coal-fired boiler. Reviewed record, estimated HCl emissions, wrote expert report June 2010 and March 2013 (Cost to Install a Scrubber at the Lamar Repowering Project Pursuant to Case-by-Case MACT), deposed August 2010 and March 2013. *Wildearth Guardian et al. v. Lamar Utilities Board*, Civil Action No. 09-cv-02974, U.S. District Court, District of Colorado. Case settled August 2013.
- For plaintiffs, expert witness on permitting, emission calculations, and wastewater treatment for coal-to-gasoline plant. Reviewed produced documents. Assisted in preparation of comments on draft minor source permit. Wrote two affidavits on key issues in case. Presented direct and rebuttal testimony 10/27 - 10/28/10 on permit enforceability and failure to properly calculate potential to emit, including underestimate of flaring emissions and omission of VOC and CO emissions from wastewater treatment, cooling tower, tank roof landings, and malfunctions. *Sierra Club, Ohio Valley Environmental Coalition, Coal River Mountain Watch, West Virginia Highlands Conservancy v. John Benedict, Director, Division of Air Quality, West Virginia Department of Environmental Protection and TransGas Development System, LLC*, Appeal No. 10-01-AQB. Virginia Air Quality Board remanded the permit on March 28, 2011 ordering reconsideration of potential to emit calculations,

including: (1) support for assumed flare efficiency; (2) inclusion of startup, shutdown and malfunction emissions; and (3) inclusion of wastewater treatment emissions in potential to emit calculations.

- For plaintiffs, expert on BACT emission limits for gas-fired combined cycle power plant. Prepared declaration in support of CBE's Opposition to the United States' Motion for Entry of Proposed Amended Consent Decree. Assisted in settlement discussions. *U.S. EPA, Plaintiff, Communities for a Better Environment, Intervenor Plaintiff, v. Pacific Gas & Electric Company, et al.*, U.S. District Court, Northern District of California, San Francisco Division, Case No. C-09-4503 SI.
- Technical expert in confidential settlement discussions with large coal-fired utility on BACT control technology and emission limits for NO_x, SO₂, PM, PM_{2.5}, and CO for new natural gas fired combined cycle and simple cycle turbines with oil backup. (July 2010). Case settled.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1998-99) at Gallagher Units 1 and 3. Reviewed produced documents, prepared expert and rebuttal reports on historic and current-day BACT for SO₂, control costs, and excess emissions of SO₂. Deposed 11/18/09. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Settled 12/22/09.
- For plaintiffs, expert witness on MACT, BACT for NO_x, and enforceability in an administrative appeal of draft state air permit issued for four 300-MW pet-coke-fired CFBs. Reviewed produced documents and prepared prefiled testimony. Deposed 10/8/09 and 11/9/09. Testified 11/10/09. *Application of Las Brisas Energy Center, LLC for State Air Quality Permit*; before the State Office of Administrative Hearings, Texas. Permit remanded 3/29/10 as LBEC failed to meet burden of proof on a number of issues including MACT. Texas Court of Appeals dismissed an appeal to reinstate the permit. The Texas Commission on Environmental Quality and Las Brisas Energy Center, LLC sought to overturn the Court of Appeals decision but moved to have their appeal dismissed in August 2013.
- For defense, expert witness in unlawful detainer case involving a gasoline station, minimart, and residential property with contamination from leaking underground storage tanks. Reviewed agency files and inspected site. Presented expert testimony on July 6, 2009, on causes of, nature and extent of subsurface contamination. *A. Singh v. S. Assaedi*, in Contra Costa County Superior Court, CA. Settled August 2009.
- For plaintiffs, expert witness on netting and enforceability for refinery being upgraded to process tar sands crude. Reviewed produced documents. Prepared expert and rebuttal reports addressing use of emission factors for baseline, omitted sources including coker, flares, tank landings and cleaning, and enforceability. Deposed. *In the Matter of Objection to the Issuance of Significant Source Modification Permit No. 089-25484-00453 to BP Products*

North America Inc., Whiting Business Unit, Save the Dunes Council, Inc., Sierra Club., Inc., Hoosier Environmental Council et al., Petitioners, B. P. Products North American, Respondents/Permittee, before the Indiana Office of Environmental Adjudication. Case settled.

- For plaintiffs, expert witness on BACT, MACT, and enforceability in appeal of Title V permit issued to 600 MW coal-fired power plant burning Powder River Basin coal. Prepared technical comments on draft air permit. Reviewed record on appeal, drafted BACT, MACT, and enforceability pre-filed testimony. Drafted MACT and enforceability pre-filed rebuttal testimony. Deposed March 24, 2009. Testified June 10, 2009. *In Re: Southwestern Electric Power Company*, Arkansas Pollution Control and Ecology Commission, Consolidated Docket No. 08-006-P. Recommended Decision issued December 9, 2009 upholding issued permit. Commission adopted Recommended Decision January 22, 2010.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications (1989-1992) at Wabash Units 2, 3 and 5. Reviewed produced documents, prepared expert and rebuttal report on historic and current-day BACT for NO_x and SO₂, control costs, and excess emissions of NO_x, SO₂, and mercury. Deposed 10/21/08. *United States et al. v. Cinergy, et al.*, In U.S. District Court for the Southern District of Indiana, Indianapolis Division, Civil Action No. IP99-1693 C-M/S. Testified 2/3/09. Memorandum Opinion & Order 5-29-09 requiring shutdown of Wabash River Units 2, 3, 5 by September 30, 2009, run at baseline until shutdown, and permanently surrender SO₂ emission allowances.
- For plaintiffs, expert witness in liability phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for three historic modifications (1997-2001) at two portland cement plants involving three cement kilns. Reviewed produced documents, analyzed CEMS data covering subject period, prepared netting analysis for NO_x, SO₂ and CO, and prepared expert and rebuttal reports. *United States v. Cemex California Cement*, In U.S. District Court for the Central District of California, Eastern Division, Case No. ED CV 07-00223-GW (JCRx). Settled 1/15/09.
- For intervenors Clean Wisconsin and Citizens Utility Board, prepared data requests, reviewed discovery and expert report. Prepared prefiled direct, rebuttal and surrebuttal testimony on cost to extend life of existing Oak Creek Units 5-8 and cost to address future regulatory requirements to determine whether to control or shutdown one or more of the units. Oral testimony 2/5/08. Application for a Certificate of Authority to Install Wet Flue Gas Desulfurization and Selective Catalytic Reduction Facilities and Associated Equipment for Control of Sulfur Dioxide and Nitrogen Oxide Emissions at Oak Creek Power Plant Units 5, 6, 7 and 8, WPSC Docket No. 6630-CE-299.
- For plaintiffs, expert witness on alternatives analysis and BACT for NO_x, SO₂, total PM₁₀, and sulfuric acid mist in appeal of PSD permit issued to 1200 MW coal fired power plant burning Powder River Basin and/or Central Appalachian coal (Longleaf). Assisted in drafting technical comments on NO_x on draft permit. Prepared expert disclosure. Presented 8+ days

of direct and rebuttal expert testimony. Attended all 21 days of evidentiary hearing from 9/5/07 – 10/30/07 assisting in all aspects of hearing. *Friends of the Chatahooche and Sierra Club v. Dr. Carol Couch, Director, Environmental Protection Division of Natural Resources Department, Respondent, and Longleaf Energy Associates, Intervener*. ALJ Final Decision 1/11/08 denying petition. ALJ Order vacated & remanded for further proceedings, Fulton County Superior Court, 6/30/08. Court of Appeals of GA remanded the case with directions that the ALJ's final decision be vacated to consider the evidence under the correct standard of review, July 9, 2009. The ALJ issued an opinion April 2, 2010 in favor of the applicant. Final permit issued April 2010.

- For plaintiffs, expert witness on diesel exhaust in inverse condemnation case in which Port expanded maritime operations into residential neighborhoods, subjecting plaintiffs to noise, light, and diesel fumes. Measured real-time diesel particulate concentrations from marine vessels and tug boats on plaintiffs' property. Reviewed documents, depositions, DVDs, and photographs provided by counsel. Deposed. Testified October 24, 2006. *Ann Chargin, Richard Hackett, Carolyn Hackett, et al. v. Stockton Port District*, Superior Court of California, County of San Joaquin, Stockton Branch, No. CV021015. Judge ruled for plaintiffs.
- For plaintiffs, expert witness on NO_x emissions and BACT in case alleging failure to obtain necessary permits and install controls on gas-fired combined-cycle turbines. Prepared and reviewed (applicant analyses) of NO_x emissions, BACT analyses (water injection, SCR, ultra low NO_x burners), and cost-effectiveness analyses based on site visit, plant operating records, stack tests, CEMS data, and turbine and catalyst vendor design information. Participated in negotiations to scope out consent order. *United States v. Nevada Power*. Case settled June 2007, resulting in installation of dry low NO_x burners (5 ppm NO_x averaged over 1 hr) on four units and a separate solar array at a local business.
- For plaintiffs, expert witness in appeal of PSD permit issued to 850 MW coal fired boiler burning Powder River Basin coal (Iatan Unit 2) on BACT for particulate matter, sulfuric acid mist and opacity and emission calculations for alleged historic violations of PSD. Assisted in drafting technical comments, petition for review, discovery requests, and responses to discovery requests. Reviewed produced documents. Prepared expert report on BACT for particulate matter. Assisted with expert depositions. Deposed February 7, 8, 27, and 28, 2007. *In Re PSD Construction Permit Issued to Great Plains Energy, Kansas City Power & Light – Iatan Generating Station, Sierra Club v. Missouri Department of Natural Resources, Great Plains Energy, and Kansas City Power & Light*. Case settled March 27, 2007, providing offsets for over 6 million ton/yr of CO₂ and lower NO_x and SO₂ emission limits.
- For plaintiffs, expert witness in remedy phase of civil action relating to alleged violations of the Clean Air Act, Prevention of Significant Deterioration, for historic modifications of coal-fired boilers and associated equipment. Reviewed produced documents, prepared expert report on cost to retrofit 24 coal-fired power plants with scrubbers designed to remove 99% of the sulfur dioxide from flue gases. Prepared supplemental and expert report on cost

estimates and BACT for SO₂ for these 24 complaint units. Deposed 1/30/07 and 3/14/07. *United States and State of New York et al. v. American Electric Power*, In U.S. District Court for the Southern District of Ohio, Eastern Division, Consolidated Civil Action Nos. C2-99-1182 and C2-99-1250. Settlement announced 10/9/07.

- For plaintiffs, expert witness on BACT, enforceability, and alternatives analysis in appeal of PSD permit issued for a 270-MW pulverized coal fired boiler burning Powder River Basin coal (City Utilities Springfield Unit 2). Reviewed permitting file and assisted counsel draft petition and prepare and respond to interrogatories and document requests. Reviewed interrogatory responses and produced documents. Assisted with expert depositions. Deposed August 2005. Evidentiary hearings October 2005. *In the Matter of Linda Chipperfield and Sierra Club v. Missouri Department of Natural Resources*. Missouri Supreme Court denied review of adverse lower court rulings August 2007.
- For plaintiffs, expert witness in civil action relating to plume touchdowns at AEP's Gavin coal-fired power plant. Assisted counsel draft interrogatories and document requests. Reviewed responses to interrogatories and produced documents. Prepared expert report "Releases of Sulfuric Acid Mist from the Gavin Power Station." The report evaluates sulfuric acid mist releases to determine if AEP complied with the requirements of CERCLA Section 103(a) and EPCRA Section 304. This report also discusses the formation, chemistry, release characteristics, and abatement of sulfuric acid mist in support of the claim that these releases present an imminent and substantial endangerment to public health under Section 7002(a)(1)(B) of the Resource Conservation and Recovery Act ("RCRA"). *Citizens Against Pollution v. Ohio Power Company*, In the U.S. District Court for the Southern District of Ohio, Eastern Division, Civil Action No. 2-04-cv-371. Case settled 12-8-06.
- For petitioners, expert witness in contested case hearing on BACT, enforceability, and emission estimates for an air permit issued to a 500-MW supercritical Power River Basin coal-fired boiler (Weston Unit 4). Assisted counsel prepare comments on draft air permit and respond to and draft discovery. Reviewed produced file, deposed (7/05), and prepared expert report on BACT and enforceability. Evidentiary hearings September 2005. *In the Matter of an Air Pollution Control Construction Permit Issued to Wisconsin Public Service Corporation for the Construction and Operation of a 500 MW Pulverized Coal-fired Power Plant Known as Weston Unit 4 in Marathon County, Wisconsin*, Case No. IH-04-21. The Final Order, issued 2/10/06, lowered the NO_x BACT limit from 0.07 lb/MMBtu to 0.06 lb/MMBtu based on a 30-day average, added a BACT SO₂ control efficiency, and required a 0.0005% high efficiency drift eliminator as BACT for the cooling tower. The modified permit, including these provisions, was issued 3/28/07. Additional appeals in progress.
- For plaintiffs, adviser on technical issues related to Citizen Suit against U.S. EPA regarding failure to update New Source Performance Standards for petroleum refineries, 40 CFR 60, Subparts J, VV, and GGG. *Our Children's Earth Foundation and Sierra Club v. U.S. EPA et al.* Case settled July 2005. CD No. C 05-00094 CW, U.S. District Court, Northern District of

California – Oakland Division. Proposed revisions to standards of performance for petroleum refineries published 72 FR 27178 (5/14/07).

- For interveners, reviewed proposed Consent Decree settling Clean Air Act violations due to historic modifications of boilers and associated equipment at two coal-fired power plants. In response to stay order, reviewed the record, selected one representative activity at each of seven generating units, and analyzed to identify CAA violations. Identified NSPS and NSR violations for NO_x, SO₂, PM/PM₁₀, and sulfuric acid mist. Summarized results in an expert report. *United States of America, and Michael A. Cox, Attorney General of the State of Michigan, ex rel. Michigan Department of Environmental Quality, Plaintiffs, and Clean Wisconsin, Sierra Club, and Citizens' Utility Board, Intervenor, v. Wisconsin Electric Power Company, Defendant*, U.S. District Court for the Eastern District of Wisconsin, Civil Action No. 2:03-CV-00371-CNC. Order issued 10-1-07 denying petition.
- For a coalition of Nevada labor organizations (ACE), reviewed preliminary determination to issue a Class I Air Quality Operating Permit to Construct and supporting files for a 250-MW pulverized coal-fired boiler (Newmont). Prepared about 100 pages of technical analyses and comments on BACT, MACT, emission calculations, and enforceability. Assisted counsel draft petition and reply brief appealing PSD permit to U.S. EPA Environmental Appeals Board (EAB). Order denying review issued 12/21/05. *In re Newmont Nevada Energy Investment, LLC, TS Power Plant*, PSD Appeal No. 05-04 (EAB 2005).
- For petitioners and plaintiffs, reviewed and prepared comments on air quality and hazardous waste based on negative declaration for refinery ultra low sulfur diesel project located in SCAQMD. Reviewed responses to comments and prepared responses. Prepared declaration and presented oral testimony before SCAQMD Hearing Board on exempt sources (cooling towers) and calculation of potential to emit under NSR. Petition for writ of mandate filed March 2005. Case remanded by Court of Appeals to trial court to direct SCAQMD to re-evaluate the potential environmental significance of NO_x emissions resulting from the project in accordance with court's opinion. California Court of Appeals, Second Appellate Division, on December 18, 2007, affirmed in part (as to baseline) and denied in part. *Communities for a Better Environment v. South Coast Air Quality Management District and ConocoPhillips and Carlos Valdez et al v. South Coast Air Quality Management District and ConocoPhillips*. Certified for partial publication 1/16/08. Appellate Court opinion upheld by CA Supreme Court 3/15/10. (2010) 48 Cal.4th 310.
- For amici seeking to amend a proposed Consent Decree to settle alleged NSR violations at Chevron refineries, reviewed proposed settlement, related files, subject modifications, and emission calculations. Prepared declaration on emission reductions, identification of NSR and NSPS violations, and BACT/LAER for FCCUs, heaters and boilers, flares, and sulfur recovery plants. *U.S. et al. v. Chevron U.S.A.*, Northern District of California, Case No. C 03-04650. Memorandum and Order Entering Consent Decree issued June 2005. Case No. C 03-4650 CRB.

- For petitioners, prepared declaration on enforceability of periodic monitoring requirements, in response to EPA's revised interpretation of 40 CFR 70.6(c)(1). This revision limited additional monitoring required in Title V permits. 69 FR 3203 (Jan. 22, 2004). *Environmental Integrity Project et al. v. EPA* (U.S. Court of Appeals for the District of Columbia). Court ruled the Act requires all Title V permits to contain monitoring requirements to assure compliance. *Sierra Club v. EPA*, 536 F.3d 673 (D.C. Cir. 2008).
- For interveners in application for authority to construct a 500 MW supercritical coal-fired generating unit before the Wisconsin Public Service Commission, prepared pre-filed written direct and rebuttal testimony with oral cross examination and rebuttal on BACT and MACT (Weston 4). Prepared written comments on BACT, MACT, and enforceability on draft air permit for same facility.
- For property owners in Nevada, evaluated the environmental impacts of a 1,450-MW coal-fired power plant proposed in a rural area adjacent to the Black Rock Desert and Granite Range, including emission calculations, air quality modeling, comments on proposed use permit to collect preconstruction monitoring data, and coordination with agencies and other interested parties. Project cancelled.
- For environmental organizations, reviewed draft PSD permit for a 600-MW coal-fired power plant in West Virginia (Longview). Prepared comments on permit enforceability; coal washing; BACT for SO₂ and PM₁₀; Hg MACT; and MACT for HCl, HF, non-Hg metallic HAPs, and enforceability. Assist plaintiffs draft petition appealing air permit. Retained as expert to develop testimony on MACT, BACT, offsets, enforceability. Participate in settlement discussions. Case settled July 2004.
- For petitioners, reviewed record produced in discovery and prepared affidavit on emissions of carbon monoxide and volatile organic compounds during startup of GE 7FA combustion turbines to successfully establish plaintiff standing. *Sierra Club et al. v. Georgia Power Company* (Northern District of Georgia).
- For building trades, reviewed air quality permitting action for 1500-MW coal-fired power plant before the Kentucky Department for Environmental Protection (Thoroughbred).
- For petitioners, expert witness in administrative appeal of the PSD/Title V permit issued to a 1500-MW coal-fired power plant. Reviewed over 60,000 pages of produced documents, prepared discovery index, identified and assembled plaintiff exhibits. Deposed. Assisted counsel in drafting discovery requests, with over 30 depositions, witness cross examination, and brief drafting. Presented over 20 days of direct testimony, rebuttal and sur-rebuttal, with cross examination on BACT for NO_x, SO₂, and PM/PM₁₀; MACT for Hg and non-Hg metallic HAPs; emission estimates for purposes of Class I and II air modeling; risk assessment; and enforceability of permit limits. Evidentiary hearings from November 2003 to June 2004. *Sierra Club et al. v. Natural Resources & Environmental Protection Cabinet, Division of Air Quality and Thoroughbred Generating Company et al.* Hearing Officer Decision issued August 9, 2005 finding in favor of plaintiffs on counts as to risk, BACT

(IGCC/CFB, NO_x, SO₂, Hg, Be), single source, enforceability, and errors and omissions. Assist counsel draft exceptions. Cabinet Secretary issued Order April 11, 2006 denying Hearing Offer's report, except as to NO_x BACT, Hg, 99% SO₂ control and certain errors and omissions.

- For citizens group in Massachusetts, reviewed, commented on, and participated in permitting of pollution control retrofits of coal-fired power plant (Salem Harbor).
- Assisted citizens group and labor union challenge issuance of conditional use permit for a 317,000 ft² discount store in Honolulu without any environmental review. In support of a motion for preliminary injunction, prepared 7-page declaration addressing public health impacts of diesel exhaust from vehicles serving the Project. In preparation for trial, prepared 20-page preliminary expert report summarizing results of diesel exhaust and noise measurements at two big box retail stores in Honolulu, estimated diesel PM₁₀ concentrations for Project using ISCST, prepared a cancer health risk assessment based on these analyses, and evaluated noise impacts.
- Assisted environmental organizations to challenge the DOE Finding of No Significant Impact (FONSI) for the Baja California Power and Sempra Energy Resources Cross-Border Transmissions Lines in the U.S. and four associated power plants located in Mexico (DOE EA-1391). Prepared 20-page declaration in support of motion for summary judgment addressing emissions, including CO₂ and NH₃, offsets, BACT, cumulative air quality impacts, alternative cooling systems, and water use and water quality impacts. Plaintiff's motion for summary judgment granted in part. U.S. District Court, Southern District decision concluded that the Environmental Assessment and FONSI violated NEPA and the APA due to their inadequate analysis of the potential controversy surrounding the project, water impacts, impacts from NH₃ and CO₂, alternatives, and cumulative impacts. *Border Power Plant Working Group v. Department of Energy and Bureau of Land Management*, Case No. 02-CV-513-IEG (POR) (May 2, 2003).
- For Sacramento school, reviewed draft air permit issued for diesel generator located across from playfield. Prepared comments on emission estimates, enforceability, BACT, and health impacts of diesel exhaust. Case settled. BUG trap installed on the diesel generator.
- Assisted unions in appeal of Title V permit issued by BAAQMD to carbon plant that manufactured coke. Reviewed District files, identified historic modifications that should have triggered PSD review, and prepared technical comments on Title V permit. Reviewed responses to comments and assisted counsel draft appeal to BAAQMD hearing board, opening brief, motion to strike, and rebuttal brief. Case settled.
- Assisted California Central Coast city obtain controls on a proposed new city that would straddle the Ventura-Los Angeles County boundary. Reviewed several environmental impact reports, prepared an air quality analysis, a diesel exhaust health risk assessment, and detailed review comments. Governor intervened and State dedicated the land for conservation purposes April 2004.
- Assisted Central California city to obtain controls on large alluvial sand quarry and asphalt plant proposing a modernization. Prepared comments on Negative Declaration on air quality,

public health, noise, and traffic. Evaluated process flow diagrams and engineering reports to determine whether proposed changes increased plant capacity or substantially modified plant operations. Prepared comments on application for categorical exemption from CEQA. Presented testimony to County Board of Supervisors. Developed controls to mitigate impacts. Assisted counsel draft Petition for Writ. Case settled June 2002. Substantial improvements in plant operations were obtained including cap on throughput, dust control measures, asphalt plant loadout enclosure, and restrictions on truck routes.

- Assisted oil companies on the California Central Coast in defending class action citizen's lawsuit alleging health effects due to emissions from gas processing plant and leaking underground storage tanks. Reviewed regulatory and other files and advised counsel on merits of case. Case settled November 2001.
- Assisted oil company on the California Central Coast in defending property damage claims arising out of a historic oil spill. Reviewed site investigation reports, pump tests, leachability studies, and health risk assessments, participated in design of additional site characterization studies to assess health impacts, and advised counsel on merits of case. Prepare health risk assessment.
- Assisted unions in appeal of Initial Study/Negative Declaration ("IS/ND") for an MTBE phaseout project at a Bay Area refinery. Reviewed IS/ND and supporting agency permitting files and prepared technical comments on air quality, groundwater, and public health impacts. Reviewed responses to comments and final IS/ND and ATC permits and assisted counsel to draft petitions and briefs appealing decision to Air District Hearing Board. Presented sworn direct and rebuttal testimony with cross examination on groundwater impacts of ethanol spills on hydrocarbon contamination at refinery. Hearing Board ruled 5 to 0 in favor of appellants, remanding ATC to district to prepare an EIR.
- Assisted Florida cities in challenging the use of diesel and proposed BACT determinations in prevention of significant deterioration (PSD) permits issued to two 510-MW simple cycle peaking electric generating facilities and one 1,080-MW simple cycle/combined cycle facility. Reviewed permit applications, draft permits, and FDEP engineering evaluations, assisted counsel in drafting petitions and responding to discovery. Participated in settlement discussions. Cases settled or applications withdrawn.
- Assisted large California city in federal lawsuit alleging peaker power plant was violating its federal permit. Reviewed permit file and applicant's engineering and cost feasibility study to reduce emissions through retrofit controls. Advised counsel on feasible and cost-effective NOx, SOx, and PM10 controls for several 1960s diesel-fired Pratt and Whitney peaker turbines. Case settled.
- Assisted coalition of Georgia environmental groups in evaluating BACT determinations and permit conditions in PSD permits issued to several large natural gas-fired simple cycle and combined-cycle power plants. Prepared technical comments on draft PSD permits on BACT, enforceability of limits, and toxic emissions. Reviewed responses to comments, advised

counsel on merits of cases, participated in settlement discussions, presented oral and written testimony in adjudicatory hearings, and provided technical assistance as required. Cases settled or won at trial.

- Assisted construction unions in review of air quality permitting actions before the Indiana Department of Environmental Management ("IDEM") for several natural gas-fired simple cycle peaker and combined cycle power plants.
- Assisted coalition of towns and environmental groups in challenging air permits issued to 523 MW dual fuel (natural gas and distillate) combined-cycle power plant in Connecticut. Prepared technical comments on draft permits and 60 pages of written testimony addressing emission estimates, startup/shutdown issues, BACT/LAER analyses, and toxic air emissions. Presented testimony in adjudicatory administrative hearings before the Connecticut Department of Environmental Protection in June 2001 and December 2001.
- Assisted various coalitions of unions, citizens groups, cities, public agencies, and developers in licensing and permitting of over 110 coal, gas, oil, biomass, and pet coke-fired power plants generating over 75,000 MW of electricity. These included base-load, combined cycle, simple cycle, and peaker power plants in Alaska, Arizona, Arkansas, California, Colorado, Georgia, Florida, Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, Oklahoma, Oregon, Texas, West Virginia, Wisconsin, and elsewhere. Prepared analyses of and comments on applications for certification, preliminary and final staff assessments, and various air, water, wastewater, and solid waste permits issued by local agencies. Presented written and oral testimony before various administrative bodies on hazards of ammonia use and transportation, health effects of air emissions, contaminated property issues, BACT/LAER issues related to SCR and SCONO_x, criteria and toxic pollutant emission estimates, MACT analyses, air quality modeling, water supply and water quality issues, and methods to reduce water use, including dry cooling, parallel dry-wet cooling, hybrid cooling, and zero liquid discharge systems.
- Assisted unions, cities, and neighborhood associations in challenging an EIR issued for the proposed expansion of the Oakland Airport. Reviewed two draft EIRs and prepared a health risk assessment and extensive technical comments on air quality and public health impacts. The California Court of Appeals, First Appellate District, ruled in favor of appellants and plaintiffs, concluding that the EIR "2) erred in using outdated information in assessing the emission of toxic air contaminants (TACs) from jet aircraft; 3) failed to support its decision not to evaluate the health risks associated with the emission of TACs with meaningful analysis," thus accepting my technical arguments and requiring the Port to prepare a new EIR. See *Berkeley Keep Jets Over the Bay Committee, City of San Leandro, and City of Alameda et al. v. Board of Port Commissioners* (August 30, 2001) 111 Cal.Rptr.2d 598.
- Assisted lessor of former gas station with leaking underground storage tanks and TCE contamination from adjacent property. Lessor held option to purchase, which was forfeited based on misrepresentation by remediation contractor as to nature and extent of

contamination. Remediation contractor purchased property. Reviewed regulatory agency files and advised counsel on merits of case. Case not filed.

- Advised counsel on merits of several pending actions, including a Proposition 65 case involving groundwater contamination at an explosives manufacturing firm and two former gas stations with leaking underground storage tanks.
- Assisted defendant foundry in Oakland in a lawsuit brought by neighbors alleging property contamination, nuisance, trespass, smoke, and health effects from foundry operation. Inspected and sampled plaintiff's property. Advised counsel on merits of case. Case settled.
- Assisted business owner facing eminent domain eviction. Prepared technical comments on a negative declaration for soil contamination and public health risks from air emissions from a proposed redevelopment project in San Francisco in support of a CEQA lawsuit. Case settled.
- Assisted neighborhood association representing residents living downwind of a Berkeley asphalt plant in separate nuisance and CEQA lawsuits. Prepared technical comments on air quality, odor, and noise impacts, presented testimony at commission and council meetings, participated in community workshops, and participated in settlement discussions. Cases settled. Asphalt plant was upgraded to include air emission and noise controls, including vapor collection system at truck loading station, enclosures for noisy equipment, and improved housekeeping.
- Assisted a Fortune 500 residential home builder in claims alleging health effects from faulty installation of gas appliances. Conducted indoor air quality study, advised counsel on merits of case, and participated in discussions with plaintiffs. Case settled.
- Assisted property owners in Silicon Valley in lawsuit to recover remediation costs from insurer for large TCE plume originating from a manufacturing facility. Conducted investigations to demonstrate sudden and accidental release of TCE, including groundwater modeling, development of method to date spill, preparation of chemical inventory, investigation of historical waste disposal practices and standards, and on-site sewer and storm drainage inspections and sampling. Prepared declaration in opposition to motion for summary judgment. Case settled.
- Assisted residents in east Oakland downwind of a former battery plant in class action lawsuit alleging property contamination from lead emissions. Conducted historical research and dry deposition modeling that substantiated claim. Participated in mediation at JAMS. Case settled.
- Assisted property owners in West Oakland who purchased a former gas station that had leaking underground storage tanks and groundwater contamination. Reviewed agency files and advised counsel on merits of case. Prepared declaration in opposition to summary

judgment. Prepared cost estimate to remediate site. Participated in settlement discussions. Case settled.

- Consultant to counsel representing plaintiffs in two Clean Water Act lawsuits involving selenium discharges into San Francisco Bay from refineries. Reviewed files and advised counsel on merits of case. Prepared interrogatory and discovery questions, assisted in deposing opposing experts, and reviewed and interpreted treatability and other technical studies. Judge ruled in favor of plaintiffs.
- Assisted oil company in a complaint filed by a resident of a small California beach community alleging that discharges of tank farm rinse water into the sanitary sewer system caused hydrogen sulfide gas to infiltrate residence, sending occupants to hospital. Inspected accident site, interviewed parties to the event, and reviewed extensive agency files related to incident. Used chemical analysis, field simulations, mass balance calculations, sewer hydraulic simulations with SWMM44, atmospheric dispersion modeling with SCREEN3, odor analyses, and risk assessment calculations to demonstrate that the incident was caused by a faulty drain trap and inadequate slope of sewer lateral on resident's property. Prepared a detailed technical report summarizing these studies. Case settled.
- Assisted large West Coast city in suit alleging that leaking underground storage tanks on city property had damaged the waterproofing on downgradient building, causing leaks in an underground parking structure. Reviewed subsurface hydrogeologic investigations and evaluated studies conducted by others documenting leakage from underground diesel and gasoline tanks. Inspected, tested, and evaluated waterproofing on subsurface parking structure. Waterproofing was substandard. Case settled.
- Assisted residents downwind of gravel mine and asphalt plant in Siskiyou County, California, in suit to obtain CEQA review of air permitting action. Prepared two declarations analyzing air quality and public health impacts. Judge ruled in favor of plaintiffs, closing mine and asphalt plant.
- Assisted defendant oil company on the California Central Coast in class action lawsuit alleging property damage and health effects from subsurface petroleum contamination. Reviewed documents, prepared risk calculations, and advised counsel on merits of case. Participated in settlement discussions. Case settled.
- Assisted defendant oil company in class action lawsuit alleging health impacts from remediation of petroleum contaminated site on California Central Coast. Reviewed documents, designed and conducted monitoring program, and participated in settlement discussions. Case settled.
- Consultant to attorneys representing irrigation districts and municipal water districts to evaluate a potential challenge of USFWS actions under CVPIA section 3406(b)(2). Reviewed agency files and collected and analyzed hydrology, water quality, and fishery data. Advised counsel on merits of case. Case not filed.

- Assisted residents downwind of a Carson refinery in class action lawsuit involving soil and groundwater contamination, nuisance, property damage, and health effects from air emissions. Reviewed files and provided advise on contaminated soil and groundwater, toxic emissions, and health risks. Prepared declaration on refinery fugitive emissions. Prepared deposition questions and reviewed deposition transcripts on air quality, soil contamination, odors, and health impacts. Case settled.
- Assisted residents downwind of a Contra Costa refinery who were affected by an accidental release of naphtha. Characterized spilled naphtha, estimated emissions, and modeled ambient concentrations of hydrocarbons and sulfur compounds. Deposed. Presented testimony in binding arbitration at JAMS. Judge found in favor of plaintiffs.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects from several large accidents as well as routine operations. Reviewed files and prepared analyses of environmental impacts. Prepared declarations, deposed, and presented testimony before jury in one trial and judge in second. Case settled.
- Assisted business owner claiming damages from dust, noise, and vibration during a sewer construction project in San Francisco. Reviewed agency files and PM10 monitoring data and advised counsel on merits of case. Case settled.
- Assisted residents downwind of Contra Costa County refinery in class action lawsuit alleging property damage, nuisance, and health effects. Prepared declaration in opposition to summary judgment, deposed, and presented expert testimony on accidental releases, odor, and nuisance before jury. Case thrown out by judge, but reversed on appeal and not retried.
- Presented testimony in small claims court on behalf of residents claiming health effects from hydrogen sulfide from flaring emissions triggered by a power outage at a Contra Costa County refinery. Analyzed meteorological and air quality data and evaluated potential health risks of exposure to low concentrations of hydrogen sulfide. Judge awarded damages to plaintiffs.
- Assisted construction unions in challenging PSD permit for an Indiana steel mill. Prepared technical comments on draft PSD permit, drafted 70-page appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analysis for electric arc furnace and reheat furnace and faulty permit conditions, among others, and drafted briefs responding to four parties. EPA Region V and the EPA General Counsel intervened as amici, supporting petitioners. EAB ruled in favor of petitioners, remanding permit to IDEM on three key issues, including BACT for the reheat furnace and lead emissions from the EAF. Drafted motion to reconsider three issues. Prepared 69 pages of technical comments on revised draft PSD permit. Drafted second EAB appeal addressing lead emissions from the EAF and BACT for reheat furnace based on European experience with SCR/SNCR. Case settled. Permit was substantially improved. See *In re: Steel Dynamics, Inc.*, PSD Appeal Nos. 99-4 & 99-5 (EAB June 22, 2000).

- Assisted defendant urea manufacturer in Alaska in negotiations with USEPA to seek relief from penalties for alleged violations of the Clean Air Act. Reviewed and evaluated regulatory files and monitoring data, prepared technical analysis demonstrating that permit limits were not violated, and participated in negotiations with EPA to dismiss action. Fines were substantially reduced and case closed.
- Assisted construction unions in challenging PSD permitting action for an Indiana grain mill. Prepared technical comments on draft PSD permit and assisted counsel draft appeal of agency permit action to the Environmental Appeals Board challenging permit based on faulty BACT analyses for heaters and boilers and faulty permit conditions, among others. Case settled.
- As part of a consent decree settling a CEQA lawsuit, assisted neighbors of a large west coast port in negotiations with port authority to secure mitigation for air quality impacts. Prepared technical comments on mobile source air quality impacts and mitigation and negotiated a \$9 million CEQA mitigation package. Represented neighbors on technical advisory committee established by port to implement the air quality mitigation program. Program successfully implemented.
- Assisted construction unions in challenging permitting action for a California hazardous waste incinerator. Prepared technical comments on draft permit, assisted counsel prepare appeal of EPA permit to the Environmental Appeals Board. Participated in settlement discussions on technical issues with applicant and EPA Region 9. Case settled.
- Assisted environmental group in challenging DTSC Negative Declaration on a hazardous waste treatment facility. Prepared technical comments on risk of upset, water, and health risks. Writ of mandamus issued.
- Assisted several neighborhood associations and cities impacted by quarries, asphalt plants, and cement plants in Alameda, Shasta, Sonoma, and Mendocino counties in obtaining mitigations for dust, air quality, public health, traffic, and noise impacts from facility operations and proposed expansions.
- For over 100 industrial facilities, commercial/campus, and redevelopment projects, developed the record in preparation for CEQA and NEPA lawsuits. Prepared technical comments on hazardous materials, solid wastes, public utilities, noise, worker safety, air quality, public health, water resources, water quality, traffic, and risk of upset sections of EIRs, EISs, FONSI, initial studies, and negative declarations. Assisted counsel in drafting petitions and briefs and prepared declarations.
- For several large commercial development projects and airports, assisted applicant and counsel prepare defensible CEQA documents, respond to comments, and identify and evaluate "all feasible" mitigation to avoid CEQA challenges. This work included developing mitigation programs to reduce traffic-related air quality impacts based on energy conservation programs, solar, low-emission vehicles, alternative fuels, exhaust treatments, and transportation management associations.

SITE INVESTIGATION/REMEDIATION/CLOSURE

- Technical manager and principal engineer for characterization, remediation, and closure of waste management units at former Colorado oil shale plant. Constituents of concern included BTEX, As, 1,1,1-TCA, and TPH. Completed groundwater monitoring programs, site assessments, work plans, and closure plans for seven process water holding ponds, a refinery sewer system, and processed shale disposal area. Managed design and construction of groundwater treatment system and removal actions and obtained clean closure.
- Principal engineer for characterization, remediation, and closure of process water ponds at a former lanthanide processing plant in Colorado. Designed and implemented groundwater monitoring program and site assessments and prepared closure plan.
- Advised the city of Sacramento on redevelopment of two former railyards. Reviewed work plans, site investigations, risk assessment, RAPS, RI/FSs, and CEQA documents. Participated in the development of mitigation strategies to protect construction and utility workers and the public during remediation, redevelopment, and use of the site, including buffer zones, subslab venting, rail berm containment structure, and an environmental oversight plan.
- Provided technical support for the investigation of a former sanitary landfill that was redeveloped as single family homes. Reviewed and/or prepared portions of numerous documents, including health risk assessments, preliminary endangerment assessments, site investigation reports, work plans, and RI/FSs. Historical research to identify historic waste disposal practices to prepare a preliminary endangerment assessment. Acquired, reviewed, and analyzed the files of 18 federal, state, and local agencies, three sets of construction field notes, analyzed 21 aerial photographs and interviewed 14 individuals associated with operation of former landfill. Assisted counsel in defending lawsuit brought by residents alleging health impacts and diminution of property value due to residual contamination. Prepared summary reports.
- Technical oversight of characterization and remediation of a nitrate plume at an explosives manufacturing facility in Lincoln, CA. Provided interface between owners and consultants. Reviewed site assessments, work plans, closure plans, and RI/FSs.
- Consultant to owner of large western molybdenum mine proposed for NPL listing. Participated in negotiations to scope out consent order and develop scope of work. Participated in studies to determine premining groundwater background to evaluate applicability of water quality standards. Served on technical committees to develop alternatives to mitigate impacts and close the facility, including resloping and grading, various thickness and types of covers, and reclamation. This work included developing and evaluating methods to control surface runoff and erosion, mitigate impacts of acid rock

drainage on surface and ground waters, and stabilize nine waste rock piles containing 328 million tons of pyrite-rich, mixed volcanic waste rock (andesites, rhyolite, tuff). Evaluated stability of waste rock piles. Represented client in hearings and meetings with state and federal oversight agencies.

REGULATORY (PARTIAL LIST)

- In December 2017, prepared comments on a DEIR for a bioenergy facility in San Bernardino County.
- In September and November 2017, prepared comments on revised Negative Declaration for Delicato Winery in San Joaquin County, California.
- In October and November 2017, prepared comments on North City Project Pure Water San Diego Program DEIR/DEIS to reclaim wastewater for municipal use.
- In August 2017, reviewed DEIR on a new residential community in eastern San Diego County and researched and wrote 60 pages of comments on air quality, greenhouse gas emissions, and health impacts.
- In August 2017, reviewed responses to comments on Part 70 operating permit and researched and wrote comments on metallic HAP issues.
- In July 2017, reviewed the FEIS for an expansion of the Port of Gulfport and researched and wrote 10 pages of comments on air quality and public health.
- In June 2017, reviewed and prepared technical report on an Application for a synthetic minor source construction permit for a new Refinery in North Dakota.
- In June 2017, reviewed responses to NPCA and other comments on the BP Cherry Point Refinery modifications and assisted counsel in evaluating issues to appeal, including GHG BACT, coker heater SCR cost effectiveness analysis, and SO₂ BACT.
- In June 2017, reviewed Part 70 Operating Permit Renewal/Modification for the Noranda Alumina LC/Gramercy Holdings I, LLC alumina processing plant, St. James, Louisiana, and prepared comments on HAP emissions from bauxite feedstock.
- In May and June 2017, reviewed FEIR on Tesoro Integration Project and prepared responses to comments on the DEIR.
- In May 2017, prepared comments on tank VOC and HAP emissions from Tesoro Integration Project, based on real time monitoring at the Tesoro and other refineries in the SCAQMD.
- In April 2017, prepared comments on Negative Declaration for Delicato Winery in San Joaquin County, California.

- In March 2017, reviewed Negative Declaration for Ellmore geothermal facility in Imperial County, California and prepared summary of issues.
- In March 2017, prepared response to Phillips 66 Company's Appeal of the San Luis Obispo County Planning Commission's Decision Denying the Rail Spur Extension Project Proposed for the Santa Maria Refinery.
- In February 2017, prepared comments on Kalama draft Title V permit for 10,000 MT/day methanol production and marine export facility in Kalama, Washington.
- In January 2017, researched and wrote 51 pages of comments on proposed Title V and PSD permits for the St. James Methanol Plant, St. James Louisiana, on BACT and enforceability of permit conditions.
- In December 2016, prepared comments on draft Title V Permit for Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana, responding to EPA Order addressing enforceability issues.
- In November 2016, prepared comments on Initial Study/Mitigated Negative Declaration for the AES Battery Energy Storage Facility, Long Beach, CA.
- In November 2016, prepared comments on Campo Verde Battery Energy Storage System Draft Environmental Impact Report.
- In October 2016, prepared comments on Title V Permit for NuStar Terminal Operations Partnership L.P, Stockton, CA.
- In October 2016, prepared expert report, Technical Assessment of Achieving the 40 CFR Part 423 Zero Discharge Standard for Bottom Ash Transport Water at the Belle River Power Plant, East China, Michigan. Reported resulted in a 2 year reduction in compliance date for elimination of bottom ash transport water. 1/30/17 DEQ Letter.
- In September 2016, prepared comments on Proposed Title V Permit and Environmental Assessment Statement, Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana.
- In September 2016, prepared response to "Further Rebuttal in Support of Appeal of Planning Commission Resolution No. 16-1, Denying Use Permit Application 12PLN-00063 and Declining to Certify Final Environmental Impact Report for the Valero Benicia Crude-by-Rail Project.
- In August 2016, reviewed and prepared comments on manuscript: Hutton et al., Freshwater Flows to the San Francisco Bay-Delta Estuary over Nine Decades: Trends Evaluation.
- In August/September 2016, prepared comments on Mitigated Negative Declaration for the Chevron Long Wharf Maintenance and Efficiency Project.

- In July 2016, prepared comments on the Ventura County APCD Preliminary Determination of Compliance and the California Energy Commission Revised Preliminary Staff Assessment for the Puente Power Project.
- In June 2016, prepared comments on an Ordinance (1) Amending the Oakland Municipal Code to Prohibit the Storage and Handling of Coal and Coke at Bulk Material Facilities or Terminals Throughout the City of Oakland and (2) Adopting CEQA Exemption Findings and supporting technical reports. Council approved Ordinance on an 8 to 0 vote on June 27, 2016.
- In May 2016, prepared comments on Draft Title V Permit and Draft Environmental Impact Report for the Tesoro Los Angeles Refinery Integration and Compliance Project.
- In March 2016, prepared comments on Valero's Appeal of Planning Commission's Denial of Valero Crude-by-Rail Project
- In February 2016, prepared comments on Final Environmental Impact Report, Santa Maria Rail Spur Project.
- In February 2016, prepared comments on Final Environmental Impact Report, Valero Benicia Crude by Rail Project.
- In January 2016, prepared comments on Draft Programmatic Environmental Impact Report for the Southern California Association of Government's (SCAG) 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy.
- In November 2015, prepared comments on Final Environmental Impact Report for Revisions to the Kern County Zoning Ordinance – 2015(C) (Focused on Oil and Gas Local Permitting), November 2015.
- In October 2015, prepared comments on Revised Draft Environmental Report, Valero Benicia Crude by Rail Project.
- In September 2015, prepared report, "Environmental, Health and Safety Impacts of the Proposed Oakland Bulk and Oversized Terminal, and presented oral testimony on September 21, 2015 before Oakland City Council on behalf of the Sierra Club.
- In September 2015, prepared comments on revisions to two chapters of EPA's Air Pollution Control Cost Manual: Docket ID No. EPA-HQ-OAR-2015-0341.
- In June 2015, prepared comments on DEIR for the CalAm Monterey Peninsula Water Supply Project.
- In April 2015, prepared comments on proposed Title V Operating Permit Revision and Prevention of Significant Deterioration Permit for Arizona Public Service's Ocotillo Power Plant Modernization Project (5 GE LMS100 105-MW simple cycle turbines operated as peakers), in Tempe, Arizona; Final permit appealed to EAB.

- In March 2015, prepared “Comments on Proposed Title V Air Permit, Yuhuang Chemical Inc. Methanol Plant, St. James, Louisiana”. Client filed petition objecting to the permit. EPA granted majority of issues. In the Matter of Yuhuang Chemical Inc. Methanol Plant, St. James Parish, Louisiana, Permit No. 2560-00295-V0, Issued by the Louisiana Department of Environmental Quality, Petition No. VI-2015-03, Order Responding to the Petitioners’ Request for Objection to the Issuance of a Title V Operating Permit, September 1, 2016.
- In February 2015, prepared compilation of BACT cost effectiveness values in support of comments on draft PSD Permit for Bonanza Power Project.
- In January 2015, prepared cost effectiveness analysis for SCR for a 500-MW coal fire power plant, to address unpermitted upgrades in 2000.
- In January 2015, prepared comments on Revised Final Environmental Impact Report for the Phillips 66 Propane Recovery Project. *Communities for a Better Environment et al. v. Contra Costa County et al. Contra Costa County (Superior Court, Contra Costa County, Case No. MSN15-0301, December 1, 2016).*
- In December 2014, prepared “Report on Bakersfield Crude Terminal Permits to Operate.” In response, the U.S. EPA cited the Terminal for 10 violations of the Clean Air Act. The Fifth Appellate District Court upheld the finding in this report in CBE et al v. San Joaquin Valley Unified Air Pollution Control District and Bakersfield Crude Terminal LLC et al, Super. Ct. No. 284013, June 23, 2017.
- In December 2014, prepared comments on Revised Draft Environmental Impact Report for the Phillips 66 Propane Recovery Project.
- In November 2014, prepared comments on Revised Draft Environmental Impact Report for Phillips 66 Rail Spur Extension Project and Crude Unloading Project, Santa Maria, CA to allow the import of tar sands crudes.
- In November 2014, prepared comments on Draft Environmental Impact Report for Phillips 66 Ultra Low Sulfur Diesel Project, responding to the California Supreme Court Decision, *Communities for a Better Environment v. South Coast Air Quality Management Dist. (2010) 48 Cal.4th 310.*
- In November 2014, prepared comments on Draft Environmental Impact Report for the Tesoro Avon Marine Oil Terminal Lease Consideration.
- In October 2014, prepared: “Report on Hydrogen Cyanide Emissions from Fluid Catalytic Cracking Units”, pursuant to the Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards, 79 FR 36880.
- In October 2014, prepared technical comments on Final Environmental Impact Reports for Alon Bakersfield Crude Flexibility Project to build a rail terminal to allow the import/export

of tar sands and Bakken crude oils and to upgrade an existing refinery to allow it to process a wide range of crudes.

- In October 2014, prepared technical comments on the Title V Permit Renewal and three De Minimus Significant Revisions for the Tesoro Logistics Marine Terminal in the SCAQMD.
- In September 2014, prepared technical comments on the Draft Environmental Impact Report for the Valero Crude by Rail Project.
- In August 2014, for EPA Region 6, prepared technical report on costing methods for upgrades to existing scrubbers at coal-fired power plants.
- In July 2014, prepared technical comments on Draft Final Environmental Impact Reports for Alon Bakersfield Crude Flexibility Project to build a rail terminal to allow the import/export of tar sands and Bakken crude oils and to upgrade an existing refinery to allow it to process a wide range of crudes.
- In June 2014, prepared technical report on Initial Study and Draft Negative Declaration for the Tesoro Logistics Storage Tank Replacement and Modification Project.
- In May 2014, prepared technical comments on Intent to Approve a new refinery and petroleum transloading operation in Utah.
- In March and April 2014, prepared declarations on air permits issued for two crude-by-rail terminals in California, modified to switch from importing ethanol to importing Bakken crude oils by rail and transferring to tanker cars. Permits were issued without undergoing CEQA review. One permit was upheld by the San Francisco Superior Court as statute of limitations had run. The Sacramento Air Quality Management District withdrew the second one due to failure to require BACT and conduct CEQA review.
- In March 2014, prepared technical report on Negative Declaration for a proposed modification of the air permit for a bulk petroleum and storage terminal to allow the import of tar sands and Bakken crude oil by rail and its export by barge, under the New York State Environmental Quality Review Act (SEQRA).
- In February 2014, prepared technical report on proposed modification of air permit for midwest refinery upgrade/expansion to process tar sands crudes.
- In January 2014, prepared cost estimates to capture, transport, and use CO₂ in enhanced oil recovery, from the Freeport LNG project based on both Selexol and Amine systems.
- In January 2014, prepared technical report on Draft Environmental Impact Report for Phillips 66 Rail Spur Extension Project, Santa Maria, CA. Comments addressed project description (piecemealing, crude slate), risk of upset analyses, mitigation measures, alternative analyses and cumulative impacts.

- In November 2013, prepared technical report on the Phillips 66 Propane Recovery Project, Rodeo, CA. Comments addressed project description (piecemealing, crude slate) and air quality impacts.
- In September 2013, prepared technical report on the Draft Authority to Construct Permit for the Casa Diablo IV Geothermal Development Project Environmental Impact Report and Declaration in Support of Appeal and Petition for Stay, U.S. Department of the Interior, Board of Land Appeals, Appeal of Decision Record for the Casa Diablo IV Geothermal Development Project.
- In September 2013, prepared technical report on Effluent Limitation Guidelines for Best Available Technology Economically Available (BAT) for Bottom Ash Transport Waters from Coal-Fired Power Plants in the Steam Electric Power Generating Point Source Category.
- In July 2013, prepared technical report on Initial Study/Mitigated Negative Declaration for the Valero Crude by Rail Project, Benicia, California, Use Permit Application 12PLN-00063.
- In July 2013, prepared technical report on fugitive particulate matter emissions from coal train staging at the proposed Coyote Island Terminal, Oregon, for draft Permit No. 25-0015-ST-01.
- In July 2013, prepared technical comments on air quality impacts of the Finger Lakes LPG Storage Facility as reported in various Environmental Impact Statements.
- In July 2013, prepared technical comments on proposed Greenhouse Gas PSD Permit for the Celanese Clear Lake Plant, including cost analysis of CO₂ capture, transport, and sequestration.
- In June/July 2013, prepared technical comments on proposed Draft PSD Preconstruction Permit for Greenhouse Gas Emission for the ExxonMobil Chemical Company Baytown Olefins Plant, including cost analysis of CO₂ capture, transport, and sequestration.
- In June 2013, prepared technical report on a Mitigated Negative Declaration for a new rail terminal at the Valero Benicia Refinery to import increased amounts of "North American" crudes. Comments addressed air quality impacts of refining increased amounts of tar sands crudes.
- In June 2013, prepared technical report on Draft Environmental Impact Report for the California Ethanol and Power Imperial Valley 1 Project.
- In May 2013, prepared comments on draft PSD permit for major expansion of midwest refinery to process 100% tar sands crudes, including a complex netting analysis involving debottlenecking, piecemealing, and BACT analyses.

- In April 2013, prepared technical report on the Draft Supplemental Environmental Impact Statement (DSEIS) for the Keystone XL Pipeline on air quality impacts from refining increased amount of tar sands crudes at Refineries in PADD 3.
- In October 2012, prepared technical report on the Environmental Review for the Coyote Island Terminal Dock at the Port of Morrow on fugitive particulate matter emissions.
- In October 2012-October 2014, review and evaluate Flint Hills West Application for an expansion/modification for increased (Texas, Eagle Ford Shale) crude processing and related modification, including netting and BACT analysis. Assist in settlement discussions.
- In February 2012, prepared comments on BART analysis in PA Regional Haze SIP, 77 FR 3984 (Jan. 26, 2012). On Sept. 29, 2015, a federal appeals court overturned the U.S. EPA's approval of this plan, based in part on my comments, concluding "...we will vacate the 2014 Final Rule to the extent it approved Pennsylvania's source-specific BART analysis and remand to the EPA for further proceedings consistent with this Opinion." Nat'l Parks Conservation Assoc. v. EPA, 3d Cir., No. 14-3147, 9/19/15.
- Prepared cost analyses and comments on New York's proposed BART determinations for NOx, SO2, and PM and EPA's proposed approval of BART determinations for Danskammer Generating Station under New York Regional Haze State Implementation Plan and Federal Implementation Plan, 77 FR 51915 (August 28, 2012).
- Prepared cost analyses and comments on NOx BART determinations for Regional Haze State Implementation Plan for State of Nevada, 77 FR 23191 (April 18, 2012) and 77 FR 25660 (May 1, 2012).
- Prepared analyses of and comments on New Source Performance Standards for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 FR 22392 (April 13, 2012).
- Prepared comments on CASPR-BART emission equivalency and NOx and PM BART determinations in EPA proposed approval of State Implementation Plan for Pennsylvania Regional Haze Implementation Plan, 77 FR 3984 (January 26, 2012).
- Prepared comments and statistical analyses on hazardous air pollutants (HAPs) emission controls, monitoring, compliance methods, and the use of surrogates for acid gases, organic HAPs, and metallic HAPs for proposed National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units, 76 FR 24976 (May 3, 2011).
- Prepared cost analyses and comments on NOx BART determinations and emission reductions for proposed Federal Implementation Plan for Four Corners Power Plant, 75 FR 64221 (October 19, 2010).

- Prepared cost analyses and comments on NO_x BART determinations for Colstrip Units 1- 4 for Montana State Implementation Plan and Regional Haze Federal Implementation Plan, 77 FR 23988 (April 20, 2010).
- For EPA Region 8, prepared report: Revised BART Cost Effectiveness Analysis for Tail-End Selective Catalytic Reduction at the Basin Electric Power Cooperative Leland Olds Station Unit 2 Final Report, March 2011, in support of 76 FR 58570 (Sept. 21, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Selective Catalytic Reduction at the Public Service Company of New Mexico San Juan Generating Station, November 2010, in support of 76 FR 52388 (Aug. 22, 2011).
- For EPA Region 6, prepared report: Revised BART Cost-Effectiveness Analysis for Flue Gas Desulfurization at Coal-Fired Electric Generating Units in Oklahoma: Sooner Units 1 & 2, Muskogee Units 4 & 5, Northeastern Units 3 & 4, October 2010, in support of 76 FR 16168 (March 26, 2011). My work was upheld in: *State of Oklahoma v. EPA*, App. Case 12-9526 (10th Cir. July 19, 2013).
- Identified errors in N₂O emission factors in the Mandatory Greenhouse Gas Reporting Rule, 40 CFR 98, and prepared technical analysis to support Petition for Rulemaking to Correct Emissions Factors in the Mandatory Greenhouse Gas Reporting Rule, filed with EPA on 10/28/10.
- Assisted interested parties develop input for and prepare comments on the Information Collection Request for Petroleum Refinery Sector NSPS and NESHAP Residual Risk and Technology Review, 75 FR 60107 (9/29/10).
- Technical reviewer of EPA's "Emission Estimation Protocol for Petroleum Refineries," posted for public comments on CHIEF on 12/23/09, prepared in response to the City of Houston's petition under the Data Quality Act (March 2010).
- Prepared comments on SCR cost effectiveness for EPA's Advanced Notice of Proposed Rulemaking, Assessment of Anticipated Visibility Improvements at Surrounding Class I Areas and Cost Effectiveness of Best Available Retrofit Technology for Four Corners Power Plant and Navajo Generating Station, 74 FR 44313 (August 28, 2009).
- Prepared comments on Proposed Rule for Standards of Performance for Coal Preparation and Processing Plants, 74 FR 25304 (May 27, 2009).
- Prepared comments on draft PSD permit for major expansion of midwest refinery to process up to 100% tar sands crudes. Participated in development of monitoring and controls to mitigate impacts and in negotiating a Consent Decree to settle claims in 2008.
- Reviewed and assisted interested parties prepare comments on proposed Kentucky air toxic regulations at 401 KAR 64:005, 64:010, 64:020, and 64:030 (June 2007).

- Prepared comments on proposed Standards of Performance for Electric Utility Steam Generating Units and Small Industrial-Commercial-Industrial Steam Generating Units, 70 FR 9706 (February 28, 2005).
- Prepared comments on Louisville Air Pollution Control District proposed Strategic Toxic Air Reduction regulations.
- Prepared comments and analysis of BAAQMD Regulation, Rule 11, Flare Monitoring at Petroleum Refineries.
- Prepared comments on Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electricity Utility Steam Generating Units (MACT standards for coal-fired power plants).
- Prepared Authority to Construct Permit for remediation of a large petroleum-contaminated site on the California Central Coast. Negotiated conditions with agencies and secured permits.
- Prepared Authority to Construct Permit for remediation of a former oil field on the California Central Coast. Participated in negotiations with agencies and secured permits.
- Prepared and/or reviewed hundreds of environmental permits, including NPDES, UIC, Stormwater, Authority to Construct, Prevention of Significant Deterioration, Nonattainment New Source Review, Title V, and RCRA, among others.
- Participated in the development of the CARB document, *Guidance for Power Plant Siting and Best Available Control Technology*, including attending public workshops and filing technical comments.
- Performed data analyses in support of adoption of emergency power restoration standards by the California Public Utilities Commission for “major” power outages, where major is an outage that simultaneously affects 10% of the customer base.
- Drafted portions of the Good Neighbor Ordinance to grant Contra Costa County greater authority over safety of local industry, particularly chemical plants and refineries.
- Participated in drafting BAAQMD Regulation 8, Rule 28, Pressure Relief Devices, including participation in public workshops, review of staff reports, draft rules and other technical materials, preparation of technical comments on staff proposals, research on availability and costs of methods to control PRV releases, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and cost of low-leak technology, and negotiations with staff.

- Participated in amending BAAQMD Regulation 8, Rule 25, Pumps and Compressors, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak and seal-less technology, and negotiations with staff.
- Participated in amending BAAQMD Regulation 8, Rule 5, Storage of Organic Liquids, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of controlling tank emissions, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 18, Valves and Connectors at Petroleum Refinery Complexes, including participation in public workshops, review of staff reports, proposed rules and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 22, Valves and Flanges at Chemical Plants, etc, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability and costs of low-leak technology, and presentation of testimony before the Board.
- Participated in amending BAAQMD Regulation 8, Rule 25, Pump and Compressor Seals, including participation in public workshops, review of staff reports, proposed rules, and other supporting technical material, preparation of technical comments on staff proposals, research on availability of low-leak technology, and presentation of testimony before the Board.
- Participated in the development of the BAAQMD Regulation 2, Rule 5, Toxics, including participation in public workshops, review of staff proposals, and preparation of technical comments.
- Participated in the development of SCAQMD Rule 1402, Control of Toxic Air Contaminants from Existing Sources, and proposed amendments to Rule 1401, New Source Review of Toxic Air Contaminants, in 1993, including review of staff proposals and preparation of technical comments on same.
- Participated in the development of the Sunnyvale Ordinance to Regulate the Storage, Use and Handling of Toxic Gas, which was designed to provide engineering controls for gases that are not otherwise regulated by the Uniform Fire Code.
- Participated in the drafting of the Statewide Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries, including participation in workshops, review of draft plans, preparation of technical comments on draft plans, and presentation of testimony before the SWRCB.

- Participated in developing Se permit effluent limitations for the five Bay Area refineries, including review of staff proposals, statistical analyses of Se effluent data, review of literature on aquatic toxicity of Se, preparation of technical comments on several staff proposals, and presentation of testimony before the Bay Area RWQCB.
- Represented the California Department of Water Resources in the 1991 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on a striped bass model developed by the California Department of Fish and Game.
- Represented the State Water Contractors in the 1987 Bay-Delta Hearings before the State Water Resources Control Board, presenting sworn expert testimony with cross examination and rebuttal on natural flows, historical salinity trends in San Francisco Bay, Delta outflow, and hydrodynamics of the South Bay.
- Represented interveners in the licensing of over 20 natural-gas-fired power plants and one coal gasification plant at the California Energy Commission and elsewhere. Reviewed and prepared technical comments on applications for certification, preliminary staff assessments, final staff assessments, preliminary determinations of compliance, final determinations of compliance, and prevention of significant deterioration permits in the areas of air quality, water supply, water quality, biology, public health, worker safety, transportation, site contamination, cooling systems, and hazardous materials. Presented written and oral testimony in evidentiary hearings with cross examination and rebuttal. Participated in technical workshops.
- Represented several parties in the proposed merger of San Diego Gas & Electric and Southern California Edison. Prepared independent technical analyses on health risks, air quality, and water quality. Presented written and oral testimony before the Public Utilities Commission administrative law judge with cross examination and rebuttal.
- Represented a PRP in negotiations with local health and other agencies to establish impact of subsurface contamination on overlying residential properties. Reviewed health studies prepared by agency consultants and worked with agencies and their consultants to evaluate health risks.

WATER QUALITY/RESOURCES

- Directed and participated in research on environmental impacts of energy development in the Colorado River Basin, including contamination of surface and subsurface waters and modeling of flow and chemical transport through fractured aquifers.
- Played a major role in Northern California water resource planning studies since the early 1970s. Prepared portions of the Basin Plans for the Sacramento, San Joaquin, and Delta basins including sections on water supply, water quality, beneficial uses, waste load

allocation, and agricultural drainage. Developed water quality models for the Sacramento and San Joaquin Rivers.

- Conducted hundreds of studies over the past 40 years on Delta water supplies and the impacts of exports from the Delta on water quality and biological resources of the Central Valley, Sacramento-San Joaquin Delta, and San Francisco Bay. Typical examples include:
 1. Evaluate historical trends in salinity, temperature, and flow in San Francisco Bay and upstream rivers to determine impacts of water exports on the estuary;
 2. Evaluate the role of exports and natural factors on the food web by exploring the relationship between salinity and primary productivity in San Francisco Bay, upstream rivers, and ocean;
 3. Evaluate the effects of exports, other in-Delta, and upstream factors on the abundance of salmon and striped bass;
 4. Review and critique agency fishery models that link water exports with the abundance of striped bass and salmon;
 5. Develop a model based on GLMs to estimate the relative impact of exports, water facility operating variables, tidal phase, salinity, temperature, and other variables on the survival of salmon smolts as they migrate through the Delta;
 6. Reconstruct the natural hydrology of the Central Valley using water balances, vegetation mapping, reservoir operation models to simulate flood basins, precipitation records, tree ring research, and historical research;
 7. Evaluate the relationship between biological indicators of estuary health and down-estuary position of a salinity surrogate (X2);
 8. Use real-time fisheries monitoring data to quantify impact of exports on fish migration;
 9. Refine/develop statistical theory of autocorrelation and use to assess strength of relationships between biological and flow variables;
 10. Collect, compile, and analyze water quality and toxicity data for surface waters in the Central Valley to assess the role of water quality in fishery declines;
 11. Assess mitigation measures, including habitat restoration and changes in water project operation, to minimize fishery impacts;
 12. Evaluate the impact of unscreened agricultural water diversions on abundance of larval fish;
 13. Prepare and present testimony on the impacts of water resources development on Bay hydrodynamics, salinity, and temperature in water rights hearings;

14. Evaluate the impact of boat wakes on shallow water habitat, including interpretation of historical aerial photographs;
 15. Evaluate the hydrodynamic and water quality impacts of converting Delta islands into reservoirs;
 16. Use a hydrodynamic model to simulate the distribution of larval fish in a tidally influenced estuary;
 17. Identify and evaluate non-export factors that may have contributed to fishery declines, including predation, shifts in oceanic conditions, aquatic toxicity from pesticides and mining wastes, salinity intrusion from channel dredging, loss of riparian and marsh habitat, sedimentation from upstream land alternations, and changes in dissolved oxygen, flow, and temperature below dams.
- Developed, directed, and participated in a broad-based research program on environmental issues and control technology for energy industries including petroleum, oil shale, coal mining, and coal slurry transport. Research included evaluation of air and water pollution, development of novel, low-cost technology to treat and dispose of wastes, and development and application of geohydrologic models to evaluate subsurface contamination from in-situ retorting. The program consisted of government and industry contracts and employed 45 technical and administrative personnel.
 - Coordinated an industry task force established to investigate the occurrence, causes, and solutions for corrosion/erosion and mechanical/engineering failures in the waterside systems (e.g., condensers, steam generation equipment) of power plants. Corrosion/erosion failures caused by water and steam contamination that were investigated included waterside corrosion caused by poor microbiological treatment of cooling water, steam-side corrosion caused by ammonia-oxygen attack of copper alloys, stress-corrosion cracking of copper alloys in the air cooling sections of condensers, tube sheet leaks, oxygen in-leakage through condensers, volatilization of silica in boilers and carry over and deposition on turbine blades, and iron corrosion on boiler tube walls. Mechanical/engineering failures investigated included: steam impingement attack on the steam side of condenser tubes, tube-to-tube-sheet joint leakage, flow-induced vibration, structural design problems, and mechanical failures due to stresses induced by shutdown, startup and cycling duty, among others. Worked with electric utility plant owners/operators, condenser and boiler vendors, and architect/engineers to collect data to document the occurrence of and causes for these problems, prepared reports summarizing the investigations, and presented the results and participated on a committee of industry experts tasked with identifying solutions to prevent condenser failures.
 - Evaluated the cost effectiveness and technical feasibility of using dry cooling and parallel dry-wet cooling to reduce water demands of several large natural-gas fired power plants in California and Arizona.

- Designed and prepared cost estimates for several dry cooling systems (e.g., fin fan heat exchangers) used in chemical plants and refineries.
- Designed, evaluated, and costed several zero liquid discharge systems for power plants.
- Evaluated the impact of agricultural and mining practices on surface water quality of Central Valley streams. Represented municipal water agencies on several federal and state advisory committees tasked with gathering and assessing relevant technical information, developing work plans, and providing oversight of technical work to investigate toxicity issues in the watershed.

AIR QUALITY/PUBLIC HEALTH

- Prepared or reviewed the air quality and public health sections of hundreds of EIRs and EISs on a wide range of industrial, commercial and residential projects.
- Prepared or reviewed hundreds of NSR and PSD permits for a wide range of industrial facilities.
- Designed, implemented, and directed a 2-year-long community air quality monitoring program to assure that residents downwind of a petroleum-contaminated site were not impacted during remediation of petroleum-contaminated soils. The program included real-time monitoring of particulates, diesel exhaust, and BTEX and time integrated monitoring for over 100 chemicals.
- Designed, implemented, and directed a 5-year long source, industrial hygiene, and ambient monitoring program to characterize air emissions, employee exposure, and downwind environmental impacts of a first-generation shale oil plant. The program included stack monitoring of heaters, boilers, incinerators, sulfur recovery units, rock crushers, API separator vents, and wastewater pond fugitives for arsenic, cadmium, chlorine, chromium, mercury, 15 organic indicators (e.g., quinoline, pyrrole, benzo(a)pyrene, thiophene, benzene), sulfur gases, hydrogen cyanide, and ammonia. In many cases, new methods had to be developed or existing methods modified to accommodate the complex matrices of shale plant gases.
- Conducted investigations on the impact of diesel exhaust from truck traffic from a wide range of facilities including mines, large retail centers, light industrial uses, and sports facilities. Conducted traffic surveys, continuously monitored diesel exhaust using an aethalometer, and prepared health risk assessments using resulting data.
- Conducted indoor air quality investigations to assess exposure to natural gas leaks, pesticides, molds and fungi, soil gas from subsurface contamination, and outgassing of carpets, drapes, furniture and construction materials. Prepared health risk assessments using collected data.
- Prepared health risk assessments, emission inventories, air quality analyses, and assisted in the permitting of over 70 1 to 2 MW emergency diesel generators.

- Prepare over 100 health risk assessments, endangerment assessments, and other health-based studies for a wide range of industrial facilities.
- Developed methods to monitor trace elements in gas streams, including a continuous real-time monitor based on the Zeeman atomic absorption spectrometer, to continuously measure mercury and other elements.
- Performed nuisance investigations (odor, noise, dust, smoke, indoor air quality, soil contamination) for businesses, industrial facilities, and residences located proximate to and downwind of pollution sources.

PUBLICATIONS AND PRESENTATIONS (Partial List - Representative Publications)

J.P. Fox, P.H. Hutton, D.J. Howes, A.J. Draper, and L. Sears, Reconstructing the Natural Hydrology of the San Francisco Bay-Delta Watershed, *Hydrology and Earth System Sciences*, Special Issue: Predictions under Change: Water, Earth, and Biota in the Anthropocene, v. 19, pp. 4257-4274, 2015. <http://www.hydrol-earth-syst-sci.net/19/4257/2015/hess-19-4257-2015.pdf>. See also: Estimates of Natural and Unimpaired Flows for the Central Valley of California: Water Years 1922-2014 at: <https://msb.water.ca.gov/documents/86728/a702a57f-ae7a-41a3-8bff-722e144059d6>.

D. Howes, P. Fox, and P. Hutton, Evapotranspiration from Natural Vegetation in the Central Valley of California: Monthly Grass Reference Based Vegetation Coefficients and the Dual Crop Coefficient Approach, *Journal of Hydrologic Engineering*, v.20, no. 10, October 2015.

Phyllis Fox and Lindsey Sears, *Natural Vegetation in the Central Valley of California*, June 2014, Prepared for State Water Contractors and San Luis & Delta-Mendota Water Authority, 311 pg.

J.P. Fox, T.P. Rose, and T.L. Sawyer, Isotope Hydrology of a Spring-fed Waterfall in Fractured Volcanic Rock, 2007.

C.E. Lambert, E.D. Winegar, and Phyllis Fox, Ambient and Human Sources of Hydrogen Sulfide: An Explosive Topic, Air & Waste Management Association, June 2000, Salt Lake City, UT.

San Luis Obispo County Air Pollution Control District and San Luis Obispo County Public Health Department, *Community Monitoring Program*, February 8, 1999.

The Bay Institute, *From the Sierra to the Sea. The Ecological History of the San Francisco Bay-Delta Watershed*, 1998.

J. Phyllis Fox, *Well Interference Effects of HDPP's Proposed Wellfield in the Victor Valley Water District*, Prepared for the California Unions for Reliable Energy (CURE), October 12, 1998.

J. Phyllis Fox, *Air Quality Impacts of Using CPVC Pipe in Indoor Residential Potable Water Systems*, Report Prepared for California Pipe Trades Council, California Firefighters Association, and other trade associations, August 29, 1998.

J. Phyllis Fox and others, *Authority to Construct Avila Beach Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, June 1998.

J. Phyllis Fox and others, *Authority to Construct Former Guadalupe Oil Field Remediation Project*, Prepared for Unocal Corporation and submitted to San Luis Obispo Air Pollution Control District, May 1998.

J. Phyllis Fox and Robert Sears, *Health Risk Assessment for the Metropolitan Oakland International Airport Proposed Airport Development Program*, Prepared for Plumbers & Steamfitters U.A. Local 342, December 15, 1997.

Levine-Fricke-Recon (Phyllis Fox and others), *Preliminary Endangerment Assessment Work Plan for the Study Area Operable Unit, Former Solano County Sanitary Landfill, Benicia, California*, Prepared for Granite Management Co. for submittal to DTSC, September 26, 1997.

Phyllis Fox and Jeff Miller, "Fathead Minnow Mortality in the Sacramento River," *IEP Newsletter*, v. 9, n. 3, 1996.

Jud Monroe, Phyllis Fox, Karen Levy, Robert Nuzum, Randy Bailey, Rod Fujita, and Charles Hanson, *Habitat Restoration in Aquatic Ecosystems. A Review of the Scientific Literature Related to the Principles of Habitat Restoration*, Part Two, Metropolitan Water District of Southern California (MWD) Report, 1996.

Phyllis Fox and Elaine Archibald, *Aquatic Toxicity and Pesticides in Surface Waters of the Central Valley*, California Urban Water Agencies (CUWA) Report, September 1997.

Phyllis Fox and Alison Britton, *Evaluation of the Relationship Between Biological Indicators and the Position of X2*, CUWA Report, 1994.

Phyllis Fox and Alison Britton, *Predictive Ability of the Striped Bass Model*, WRINT DWR-206, 1992.

J. Phyllis Fox, *An Historical Overview of Environmental Conditions at the North Canyon Area of the Former Solano County Sanitary Landfill*, Report Prepared for Solano County Department of Environmental Management, 1991.

J. Phyllis Fox, *An Historical Overview of Environmental Conditions at the East Canyon Area of the Former Solano County Sanitary Landfill*, Report Prepared for Solano County Department of Environmental Management, 1991.

Phyllis Fox, *Trip 2 Report, Environmental Monitoring Plan, Parachute Creek Shale Oil Program*, Unocal Report, 1991.

- J. P. Fox and others, "Long-Term Annual and Seasonal Trends in Surface Salinity of San Francisco Bay," *Journal of Hydrology*, v. 122, p. 93-117, 1991.
- J. P. Fox and others, "Reply to Discussion by D.R. Helsel and E.D. Andrews on Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 27, no. 2, 1991.
- J. P. Fox and others, "Reply to Discussion by Philip B. Williams on Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 27, no. 2, 1991.
- J. P. Fox and others, "Trends in Freshwater Inflow to San Francisco Bay from the Sacramento-San Joaquin Delta," *Water Resources Bulletin*, v. 26, no. 1, 1990.
- J. P. Fox, "Water Development Increases Freshwater Flow to San Francisco Bay," *SCWC Update*, v. 4, no. 2, 1988.
- J. P. Fox, *Freshwater Inflow to San Francisco Bay Under Natural Conditions*, State Water Contracts, Exhibit 262, 58 pp., 1987.
- J. P. Fox, "The Distribution of Mercury During Simulated In-Situ Oil Shale Retorting," *Environmental Science and Technology*, v. 19, no. 4, pp. 316-322, 1985.
- J. P. Fox, "El Mercurio en el Medio Ambiente: Aspectos Referentes al Peru," (Mercury in the Environment: Factors Relevant to Peru) Proceedings of Simposio Los Pesticidas y el Medio Ambiente," ONERN-CONCYTEC, Lima, Peru, April 25-27, 1984. (Also presented at Instituto Tecnologico Pesquero and Instituto del Mar del Peru.)
- J. P. Fox, "Mercury, Fish, and the Peruvian Diet," *Boletin de Investigacion*, Instituto Tecnologico Pesquero, Lima, Peru, v. 2, no. 1, pp. 97-116, 1984.
- J. P. Fox, P. Persoff, A. Newton, and R. N. Heistand, "The Mobility of Organic Compounds in a Codisposal System," *Proceedings of the Seventeenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1984.
- P. Persoff and J. P. Fox, "Evaluation of Control Technology for Modified In-Situ Oil Shale Retorts," *Proceedings of the Sixteenth Oil Shale Symposium*, Colorado School of Mines Press, Golden, CO, 1983.
- J. P. Fox, *Leaching of Oil Shale Solid Wastes: A Critical Review*, University of Colorado Report, 245 pp., July 1983.
- J. P. Fox, *Source Monitoring for Unregulated Pollutants from the White River Oil Shale Project*, VTN Consolidated Report, June 1983.
- A. S. Newton, J. P. Fox, H. Villarreal, R. Raval, and W. Walker II, *Organic Compounds in Coal Slurry Pipeline Waters*, Lawrence Berkeley Laboratory Report LBL-15121, 46 pp., Sept. 1982.

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