

DOCKETED

Docket Number:	21-SPPE-01
Project Title:	CA3 Backup Generating Facility-Vantage
TN #:	242755
Document Title:	VDC's Rebuttal Testimony - CA3BGF
Description:	N/A
Filer:	Scott Galati
Organization:	DayZenLLC
Submitter Role:	Applicant Representative
Submission Date:	4/22/2022 3:17:02 PM
Docketed Date:	4/22/2022

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:

Application For Small Power Plant
Exemption for the
CA3 BACKUP GENERATING FACILITY

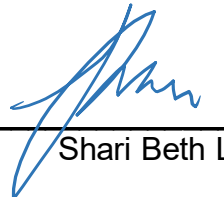
DOCKET NO. 21-SPPE-01

**DECLARATION OF SHARI BETH
LIBICKI**

I, Shari Beth Libicki, declare as follows:

1. I am presently employed as a Director in Ramboll's Sustainability and Air Quality Service Lines.
2. A copy of my professional qualifications and experience is included with this Rebuttal Testimony and is incorporated by reference in this Declaration.
3. I prepared the attached testimony relating to Air Quality and Public Health for the Application for Small Power Plant Exemption for the CA3 Backup Generating Facility (California Energy Commission Docket Number 21-SPPE-01).
4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.
5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed at San Francisco, CA on April 22, 2022.



Shari Beth Libicki

STATE OF CALIFORNIA

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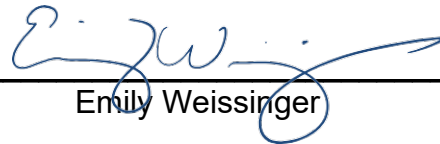
DOCKET NO. 21-SPPE-01

**DECLARATION OF EMILY
WEISSINGER**

I, Emily Weissinger, declare as follows:

1. I am presently employed as a Senior Managing Consultant with Ramboll.
2. A copy of my professional qualifications and experience is included with this Rebuttal Testimony and is incorporated by reference in this Declaration.
3. I prepared the attached testimony relating to Air Quality and Public Health for the Application for Small Power Plant Exemption for the CA3 Backup Generating Facility (California Energy Commission Docket Number 21-SPPE-01).
4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.
5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed at Raleigh, North Carolina on April 22, 2022.



Emily Weissinger

**VANTAGE DATA CENTERS
CA3 BACKUP GENERATING FACILITY
21-SPPE-01
AIR QUALITY AND PUBLIC HEALTH
REBUTTAL TESTIMONY**

I. Name: Shari Beth Libicki
Emily Weissinger

II. Purpose:

Our testimony addresses the Committee Question contained in the Notice of Prehearing Conference/Evidentiary Hearing dated April 20, 2022 relating to the health risk assessment performed for the CA3 Backup Generating Facility (21-SPPE-01)

III. Qualifications:

Shari Beth Libicki: I am presently employed as a Director in Ramboll's Sustainability and Air Quality Service Lines and I have been at Ramboll for nearly 33 years. I have a Doctorate Degree in Chemical Engineering from Stanford University and I have 33 years of experience in conducting greenhouse gas, energy, air quality and public health analyses within California and other western states.

I have been engaged by Vantage Data Centers to prepare the Bay Area Air Quality Management District Authority to Construct applications and the air quality and public health analyses for development of the CA3 Backup Generating Facility. I prepared the Air Quality section of the Application For Small Power Plant Exemption and Air Quality Technical Reports, as well as the post-filing information, data responses, and supplemental filings.

Emily Weissinger: I am presently employed as a Senior Managing Consultant in Ramboll's Air Quality Service Line and I have been at Ramboll for 12 years. I have a Master's Degree in Civil, Environmental, and Sustainable Engineering from Arizona State University and I have 12 years of experience in conducting greenhouse gas, energy, air quality and public health analyses within California and other western states.

I have been engaged by Vantage Data Centers to prepare the Bay Area Air Quality Management District Authority to Construct applications and the air quality and public health analyses for development of the CA3 Backup Generating Facility. I prepared the Air Quality section of the Application For Small Power Plant Exemption and Air Quality Technical

Reports, as well as the post-filing information, data responses, and supplemental filings.

Detailed descriptions of our qualifications are presented in the resume which is included in Attachment A to this Rebuttal Testimony package.

To the best of our knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are our own. We make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, we will be sponsoring the exhibits listed on Vantage Data Centers' Proposed Exhibit List which is attached to its PreHearing Conference Statement.

V. Opinion and Conclusions

The Committee requested the parties respond to the following question.

On pages 4.3-52 through 4.3-55 of the FEIR, the cumulative Health Risk Assessment (HRA) identifies four areas in which the impacts from cumulative sources exceed the Bay Area Air Quality Management District's thresholds of significance: (1) cancer risk at the maximally exposed individual sensitive receptor (MEISR); (2) cancer risk at the maximally exposed individual resident (MEIR); (3) annual particulate matter (PM2.5) concentrations at the MEISR; and (4) annual PM2.5 concentrations at the maximally exposed individual worker (MEIW).²¹ Staff states that "the cumulative impacts are the summation of each category (cancer risks, PM 2.5 concentrations) from all the sources to each receptor, and the exceedances in cancer risk (Table 4.3-12) and PM2.5 concentration (Table 4.3-14) are because the background values (i.e., sources of surrounding highways, major streets, and railways) are already very high or even have already exceeded the thresholds." Staff further states that the incremental contributions from the project are "not cumulatively considerable" and therefore the project does not cause cumulatively considerable impacts.

Please explain in greater detail for each exceedance why the incremental effects of the project are not "cumulatively considerable" when viewed in connection with the effects of

past projects, the effects of other current projects, and the effects of probable future projects. Include a discussion of CEQA case law that is relevant to this issue.

Our response is as follows:

Background

Pages 4.3-52 through 4.3-55 of the Final Environmental Impact Report (FEIR) present the results of the cumulative Health Risk Assessments (HRAs) conducted by the applicant and by California Energy Commission (CEC) staff. The cumulative HRA from the applicant was conducted in response to Data Requests 25 and 26, which requested that the applicant investigate sources of toxic air contaminants (TACs) within a 2,000-foot radius of the proposed project. That analysis focused on the Maximally Exposed Individual Sensitive Receptor (MEISR), which was a residential receptor located directly south of the southernmost corner of the property, adjacent to the Caltrain railroad line. In the Data Request responses, the applicant explained that the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) Guidelines and Tools were developed to analyze the impacts from sources within a 1,000-foot radius of a project and as a result, the risk and hazard impacts from sources that are further than 1,000 feet from the MEISR are overestimates. Further, the applicant noted that the nearby railroad line greatly elevated the health risk impacts at the MEISR.

CEC staff conducted an independent cumulative HRA that assessed the proposed project's impact in combination with sources of TACs within a 1,000-foot radius (consistent with BAAQMD CEQA Guidelines). For that analysis, CEC staff focused on impacts at the following maximally exposed receptor types: Maximally Exposed Individual Resident (MEIR), Maximally Exposed Individual Worker (MEIW), Maximally Exposed Daycare Receptor (MEDR), Maximally Exposed School Receptor (MESR), and Maximally Exposed Recreational Receptor (MERR). It's important to note that the MEIR in the CEC's analysis is the same residential receptor that was evaluated as the MEISR in the applicant's analysis. Furthermore, although CEC staff chose to investigate multiple receptor types, BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards* defines the CEQA thresholds for cumulative health risk impacts in the context of the "maximum likely exposed individual (resident)."¹

¹ See page 6. Available at: <https://www.baaqmd.gov/~media/files/planning-and-research/ceqa/baaqmd-modeling-approach.pdf>. Accessed: April 2022.

Cumulative Cancer Risk

As the Committee has noted, the cumulative HRA in the FEIR identifies that the cancer risk at the MEISR and MEIR would exceed the BAAQMD's threshold of significance of 100 in a million cancer risk, with values of 133 and 112 in a million, respectively. As noted above, the primary difference between these two analyses is the radius used in the evaluation of contributing sources of TACs; the value of 133 in a million was estimated using a 2,000-foot radius, whereas the value of 112 in a million was estimated using a 1,000-foot radius, which is consistent with BAAQMD's CEQA Guidelines. In fact, if one were to extrapolate the distance multipliers in BAAQMD's tool out to the actual distances between the receptors and the sources beyond 1,000 feet, the computed cancer risk from those sources is negligible. Another difference between the two analyses is that the applicant's analysis assumed a 100% load scenario for the project (which resulted in a cancer risk of 9.9 in a million at the MEISR), whereas CEC staff assumed a more realistic worst-case scenario of 25% load (which resulted in a cancer risk of 8.73 in a million at the MEIR). For both analyses, more than 50% of the cumulative cancer risk is driven by the adjacent Caltrain railroad line, which is in the process of being electrified under the Caltrain Modernization Program (CalMod) and is projected to be available for passenger service in 2024.² Once electrified, the improved system will reduce criteria air pollutant emissions by up to 97 percent.³ The cancer risk from the proposed project is exclusively from diesel particulate matter (DPM) released from the emergency generators. Both HRAs use DPM emission rates assuming the generators are combusting petroleum diesel. The scientific literature indicates that DPM emissions from renewable diesel, which CEC mitigation measure **GHG-2** is requiring, are lower than DPM emissions from petroleum diesel, which would also lower the cumulative risks. If one incorporated only the effects of the CalMod project into the cumulative HRA analyses, the cancer risk estimate at both the MEISR and MEIR would fall beneath the 100 in a million cancer risk threshold for cumulative impacts, indicating that the incremental effects of the project are not cumulatively considerable.

Annual PM_{2.5} Concentration

The Committee also noted that the cumulative HRA in the FEIR identifies that the annual PM_{2.5} concentration at the MEISR and MEIW would exceed the BAAQMD's threshold of significance of 0.8 µg/m³, with values of 1.3 and 1.01 µg/m³, respectively. As discussed previously, the applicant's MEISR evaluates the same

² See: <https://calmod.org/>. Accessed: April 2022.

³ See:

<https://www.caltrain.com/Assets/Planning/Sustainability/Caltrain+Sustainability+Summary+Report.pdf>. Accessed: April 2022.

receptor as CEC staff's MEIR, with the main distinguishing factor between the two HRA analyses being the radius used in evaluating contributing sources of TACs. Similar to the cancer risk, we anticipate that the PM_{2.5} concentration from sources beyond 1,000 is substantially overstated. Table 4.3-14 of the FEIR shows that the annual PM_{2.5} concentration for the MEIR would be below BAAQMD's threshold of significance at 0.58 µg/m³, indicating that the incremental effects of the proposed project at the maximally exposed individual residential receptor are not cumulatively considerable. In addition, the analysis remains conservative as the PM_{2.5} contributions from the nearby Caltrain railroad line would diminish under the CalMod project. Furthermore, the project's commitment to using renewable diesel under CEC mitigation measure **GHG-2** has the potential to further reduce the project's own PM_{2.5} contribution as research⁴ has shown that renewable diesel-fueled engines result in reduced mass-based particulate matter emissions over petroleum diesel-fueled engines. For the MEIW, the actual exposure to the worker receptor is far less than 1.01 µg/m³. Accounting for the time that the worker is present at that location, the true exposure is less than one-third the value, or under 0.3 µg/m³ and as a result, the incremental effects of the proposed project at the MEIW are not cumulatively considerable.

⁴ Singh, Devendra et al. 2018. Comprehensive review of combustion, performance and emissions characteristics of a compression ignition engine fuels with hydroprocessed renewable diesel. *Renewable and Sustainable Energy Reviews*. 81: 2947-2954.

ATTACHMENT A
RESUMES

SHARI BETH LIBICKI, PHD

Principal

Dr. Shari Beth Libicki has over 30 years of chemical fate and transport experience, as applied to managing greenhouse gas (GHG) emissions and estimating air emissions and dispersion from refineries, chemical processes, landfills, quarries and new developments. She is an expert on GHG evaluations for California Environmental Quality Act (CEQA) documents. She has conducted extensive air quality regulatory assessments for New Source Review/Prevention of Significant Deterioration (NSR/PRD) permitting. She has directed community monitoring programs under California's AB 617. Shari has lectured widely on evaluating climate change impacts for new developments and estimating chemical exposure for risk assessments. She currently serves as an Adjunct Professor in the Department of Chemical Engineering at Stanford University.



EDUCATION

PhD, Chemical Engineering, Stanford University, 1985
MS, Chemical Engineering, Stanford University, 1981
BSE, Chemical Engineering, University of Michigan, 1979

EXPERIENCE HIGHLIGHTS

Expert Support

- Served as an expert witness for a series of mass torts where plaintiffs alleged harm resulting from emissions from a flaring event at a refinery in Texas. There was nearly a decade of information from ambient air monitors sited in and around the refinery. In addition, there was monitoring information on emissions from the flare during the flaring event. We conducted detailed air dispersion modeling to assess the statistical distribution of exposure among hundreds of named plaintiffs. Issues centered around using discrete monitoring data and air dispersion modeling to evaluate impacts in the neighborhood.
- Assisted a chemical manufacturing plant evaluate neighborhood concentrations of ethylene oxide using a monitoring network and a windspeed/wind direction analysis to better understand source allocations. Worked with the facility to minimize ethylene oxide emissions and further reduce neighborhood concentrations.
- Served as an expert witness for several cases where plaintiffs alleged harm as a result of living near a waterway into which oil was released as a result of excessive rainfall at a refinery. Issues in the case included an evaluation of the cause of the

CONTACT INFORMATION

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release, emissions estimation, dispersion modeling, and an analysis of an extensive set of ambient air quality data.

- Reconstructed plumes from explosions using NOAA radar data from a refinery and chemical plant. The plume reconstruction allowed us to pinpoint the exact location of the plume as a function of time and informed the potential exposures by plaintiffs the plume.
- Evaluated the location of a plume after a fire at a refinery which resulted in a shelter in place order. The plume was reconstructed using a wide variety of evidence, including photographs, movies, and sophisticated air quality modeling.
- Served as an expert witness for a case where exposure to dust and diesel particulate from a quarry was alleged. The plaintiffs put microsensors on their houses to measure dust and posted the data on a public website. We were able to use the publicly available data to show that the dust in the neighborhood was not correlated with mining activities or blasting events. In addition, we estimated the emissions and dispersion of diesel particulate to show that the diesel particulate from mining operations was below a level of significance.
- Served as an expert witness in defense of claims of property diminution from fugitive dust emissions from an adjacent coke production facility. The work was conducted using nearby monitors that recorded PM₁₀ concentrations before and after the establishment of the production facility. A meteorological analysis was also conducted that evaluated whether wind direction impacted measured PM₁₀ concentrations. The case was further complicated by the presence of rail lines that transported large amounts of coal fines.
- Provided expert support in a case requiring reconstruction of emissions over a 70-year period from a specialty chemical manufacturer. Emissions estimation involved reconstructing historical processes and process controls and combining them with annual production records. The emissions estimates were used to assist in case settlement.
- Served as an expert witness in defense of a remediated wood treatment facility where historical dust emissions were alleged to have contaminated the neighborhood. The analysis included an evaluation of the various factors that would impact dust contamination including vegetation, rainfall, vehicle count, and meteorology.
- Provided technical support to attorneys on a litigation case where an accidental release of a particulate and liquid material from a refinery was alleged to have caused harm to thousands of plaintiffs. This included an engineering evaluation of the release quantity, meteorological data analysis, and an evaluation of dispersion and deposition of aerosols in complex and intervening terrain.
- Served as an expert witness evaluating PCB airborne emissions from process emissions and soil contamination from a PCB-producing facility. This included PCB manufacturing process reconstruction since the beginning of PCB manufacturing, as well as an estimate of the amount of PCB emitted from fugitive dust from vehicles traveling over contaminated roads, and dust track-out.
- Served as an expert witness supporting the permitting efforts of a large landfill in Texas. Permit contestants alleged that the landfill gas collection system was improperly designed and was incapable of collecting landfill gas consistent with the requirements. The case included the use of surface methane measurements, odor complaint history, and well measurements to show that the landfill gas system was operating as designed.
- Provided expert assistance in estimating airborne emissions and onshore impacts from an offshore oil leak. Evaluation included reviewing monitoring data, data on emissions, meteorology, and the potential for dissolution and degradation.
- Served as an expert witness in a case where exposure to arsenic from the burning of CCA-treated wood was alleged. The case surrounding the potential for a lineman to be exposed to arsenic from CCA-treated utility poles due to utility pole fires.
- Served as an expert witness evaluating impacts from airborne emissions associated with an oil spill into a river. The oil flowed downriver, and odors from the spill were noticed along the river. Ambient air monitoring data was available from soon after the spill occurred. Issues associated

with this case included evaluating air monitoring data, and estimating volatilization, dispersion and chemical speciation of the emissions.

- Served as an expert witness in a litigation case where a release of mercaptans from a refinery was alleged to cause harm to students in a nearby school. The work involved analysis of samples to evaluate the composition of the released materials, an analysis of the release quantities, and the dispersion of those emissions.
- Provided impartial technical assistance to both the plaintiffs and defense in a toxic tort case involving aerosolized air emissions from a large acid manufacturing facility in Arkansas. Particular issues in the case surrounded the potential for particulate formation under certain meteorological conditions; evaluation of control technology, and overall evaluation of emissions from the facility.
- Provided expert assistance on a litigation case where subsurface methane gas from a rogue landfill was alleged to damage property values in a housing development. Developed methods to evaluate trace chemicals and extent of gas migration.
- Provided independent technical assistance to the court's mediator on landfill gas migration and control issues for a landfill toxic tort litigation involving a very large landfill (several square miles) in the Eastern United States.

Monitoring

- Project director for a community monitoring program in Richmond, California under California's AB 617. Richmond is an environmental justice community with large industrial sources, including a refinery and an acid plant, as well as heavily travelled freeways in its midst. The monitoring program included over 70 particulate and nitrogen dioxide monitors sited through a community outreach program. The monitoring was combined with a sophisticated modeling program incorporating real-time meteorology and traffic to yield hyper-localized air quality information including source attribution information.
- For a leading environmental non-governmental organization, prepared a white paper on the different types of inexpensive monitors that may be used to monitor emissions around oil and gas operations. We evaluated the scientific literature for monitor accuracy, stability and the potential for cross sensitivity to pollutants, and provided information on commercially available monitors, and also evaluated pre-commercialized monitoring options to determine what may be on the market in the short to medium term.
- Assisted in the design of a refinery monitoring plan in California. The monitoring was required as the result of a settlement with the host city as a result of a fire several years earlier. The refinery monitoring plan was intended to allow the community, on a real-time basis, to evaluate whether there were releases from the refinery, and included Fourier Transform Infra-Red (FTIR) monitors on the fence line, along with fixed monitors for a variety of criteria pollutants and toxic air contaminants. Our input was primarily designed to make the data more useful to the community and refiner.
- Directed a yearlong ambient air-monitoring program to measure particulate matter and diesel particulate matter (DPM) at the boundary of a large landfill in Los Angeles and a nearby school. The results of the monitoring program were analyzed temporally and as a function of meteorology. The results of the program showed that nearby freeways provided an overwhelming fraction of the measured DPM.
- Designed a complex fourteen-station ambient air monitoring network around a co-disposal landfill to measure the concentrations of 19 toxic chemicals in both gaseous and particulate phase for risk assessment purposes and negotiated approval with local, state and federal regulators.
- Analyzed the results of a complex multi-year total suspended particulate monitoring program to understand the sources of arsenic in the ambient air, and to evaluate the health risks of the arsenic levels that could be related to nearby facility emissions.
- Designed and conducted the compliance ambient air monitoring program for a large hazardous waste facility. The ongoing program collects whole air and total suspended particulate samples at five stationary sites. Prepared risk assessment based on the program, and quarterly reports for

review by the local air district and the California Environmental Protection Agency's (EPA)'s Department of Toxic Substances and Control (DTSC).

- Designed, negotiated and managed a novel cost-effective ambient air monitoring program that yielded real-time information on the health impacts of a site remediation. This study is the basis of a well-received paper.

Land Use Entitlement

- Project director for Phillips 66 Rodeo Renewed Environmental Impact Report project, which will result in the largest renewable fuels refinery in the United States. Ramboll prepared technical sections for review by the lead agency, including air quality, greenhouse gases, hazards and noise. Key issues included transportation, and the construction of new processing units at the refinery.
- Project director for the Chevron Renewal Project Revised Environmental Impact Report to allow a large capital project to proceed at the Chevron Richmond Refinery. The Revised EIR fulfilled the requirements of a court decision with specific focus on the Climate Change and Air Quality sections of the EIR. The revision of the Climate Change section described mitigation measures and quantification of the efficacy of those mitigation measures. The Air Quality section included a comprehensive estimate of emissions from the refinery under a range of operating scenarios and addressed a range of process alternatives in the refinery.
- Prepared comprehensive air quality analysis for two large municipal solid waste landfills in Southern California. Evaluation included impact of exhaust from non-road heavy equipment, dust from waste operations, and emissions from landfill gas escaping the collection system, and flares and turbines used to destroy the landfill gas. Projects included public testimony on results of analysis.
- Analyzed the impacts of potential accident scenarios prior to the construction of several new industrial facilities. The results of the analyses were used to make recommendations as to how to improve the safety and minimize the risks to the surrounding community.
- Project director for the development of the California Air Pollution Control Officer's Association (CAPCOA) manual on quantifying mitigation for a wide variety of carbon reduction measures that can be used for residential and commercial development.
- Project director for CalEEMod®, a new software package to estimate GHG, air toxics and criteria pollutant emissions from new development projects in California.
- Evaluated climate change impacts of dozens of new projects under CEQA and National Environmental Policy Act (NEPA). Specific types of projects include large, multi-use developments, landfill expansions, and transportation hubs.
- Provided innovative air quality services for entitlement activities, including evaluating the impacts of freeways on air quality, the estimation of emissions from complex industrial facilities, and the impact on public health of those emissions. Provided testimony at public hearings in support of technical analyses.

Permitting and Enforcement

- Provided nationwide compliance assistance to six iron and steel mini-mills. Work conducted includes: preparation of Title V permit applications and supporting emissions estimates; preparation of PSD permits and associated emissions and dispersion modeling; evaluation of RACT controls for mini-mills.
- Managed PSD permit applications for two aluminum smelting facilities. This work included preparation of the emissions inventories, managing the Class I and Class II modeling effort, conducting the best available control technology (BACT) analysis, and preparing the technical document. She also negotiated permit conditions with the agencies, and assisted with cross-border discussions with other impacted agencies.
- Assisted a large landfill in Southern California respond to a series of Notices of Violation surrounding odor issues. Ramboll conducted computational fluid dynamic (CFD) modeling study to evaluate the sources of odors at the landfill, as well as to predict where odors might occur in the neighborhood and under what conditions. Ramboll also conducted a surrogate sampling study

where it was found that ethanol was a surrogate for odors. Finally, Ramboll assisted in the negotiations which allowed the landfill to continue operations.

- Managed the preparation of an application for an Authority to Construct for a state-of-the-art hazardous waste treatment storage and disposal facility, which included a risk assessment for the project, and successfully negotiated permit conditions with state and local agencies. Currently working with facility and regulators to implement permit conditions.
- Worked as a technical advisor to the Imperial County Air Pollution Control District (ICAPCD) for the permitting of a rail-haul landfill. This landfill is proposed to be the largest landfill in the United States, and had monitoring, modeling, and enforceability issues associated with the permit. Of particular interest was a phased permitting approach that allowed the landfill operator to take advantage of newer technologies that could reduce emissions of criteria pollutants over time.
- Prepared and submitted several Federal Operating Permit Applications under Title V of the Clean Air Act for industrial facilities. Currently working on ongoing negotiation for permits.

Other

- Evaluated the transport of perfluorooctanoic acid (PFOA) in the air and in the ocean as a part of a large multiphase study being carried out by DuPont. The study resulted in a poster presentation at the American Geophysical Union and centered on how the chemical properties of PFOA impact its transport.
- Evaluated the potential contribution of airborne dioxin releases from a refinery to deposit within a defined boundary and contribute to measured dioxin concentrations in wastewater. Analysis included estimation of dioxin releases from a variety of units, including flares; selection of units most likely to contribute to dioxin deposition; selection of deposition modeling technique; and analysis of results.
- Managed the consequence analysis for several Risk Management and Prevention Programs (RMPP). Projects included scenarios with acids, toxic gases, and chemical reactions. Analysis involved using standard analytical tools as well as some state of the art tools.
- Prepared carbon footprints for facilities in a variety of industries, including landfills, large and small manufacturing operations, commercial developments, and municipal services; assisted in development of GHG minimization programs.
- Provided support to a large shipping company in evaluating the effectiveness of its emissions reduction programs; oversaw design of an automated database system to track fuel use and emissions reductions from a variety of innovative programs to improve reporting and streamline the program.
- Evaluated the potential of deposited arsenic-based pesticide to contaminate adjacent property. Transport pathways examined included wind-blown dust, surface water transport, and vehicle trackout.
- Conducted preliminary evaluation of whether patterns of measured lead in soil supported contention that lead resulted from airborne emissions from a lead emitting stack located at the site. Concluded that insufficient data was available for analysis.
- Designed a protocol for estimating the quantities of specific hazardous chemicals disposed of in California by region and waste type, and worked with the Department of Health Services to verify protocol.
- Gave lecture series on the harmonization of the State and Federal Risk Management Programs in California, and how to best implement the unified program.
- Prepared and negotiated a settlement proposal with regulators for a large facility which included new methods for calculation of organic emissions, additional controls on processes, and monitoring requirements.
- Gave an invited lecture series to senior environmental professionals in Mexico on the technical basis of the estimation of the impacts of sudden releases of toxic and flammable materials, in the wake of the Guadalajara explosions. Managed technical support team for large toxic tort litigation

that involved estimating current and historical emissions from several large facilities, comparing and choosing appropriate meteorological data for the analysis dispersion modeling, mapping of impacts with respect to plaintiffs, and comparison with air quality guidelines and toxicological end points.

- Analyzed the particulate emissions from a basic chemicals processing plant containing over 90 separate sources, conducting a dispersion and culpability analysis, and evaluating the effectiveness of proposed and implemented source controls.

Prior to joining Ramboll, Shari held the following positions:

- Physical Sciences Officer, Bureau of Oceans and Environmental and Scientific Affairs, US Department of State
 - Developed and implemented a successful negotiation strategy for cooperative scientific projects with Japan and the Soviet Union.
 - Worked with Japan's Science and Technology Agency to initiate a Japanese funding organization for innovative international biotechnological studies.
- Staff Scientist, Alza Corporation
 - Led teams that created, designed, tested, and patented controlled release transdermal and osmotic pump drug delivery systems.
 - Studied the correlation between drug physical chemical data and dermal transport and absorption.
 - Designed and implemented systems to provide effective membrane thickness control in the manufacture of miniature osmotic pumps.
- Lecturer, Department of Chemical Engineering, Stanford University
 - Taught courses in Chemical Engineering Laboratory and Technical Speaking and Writing.

AWARDS AND HONORS

American Association for the Advancement of Sciences Diplomacy Fellow, 1987-1988

United States Department of State Meritorious Honor Award, March 1989

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Member, American Institute of Chemical Engineers

Member, Air & Waste Management Association

PATENTS

H.F. Sanders, Y.L. Cheng, D.J. Ensore, S.B. Libicki. Transdermal Drug Composition with Dual Permeation Enhancers. Patent Number: 4,820,720. April 11, 1989.

R.M. Gale, D.J. Ensore, D.E. Nedberge, M. Nelson, Y.L. Cheng, S.B. Libicki. Transdermal Administration of Progesterone, Estradiol Esters, and Mixtures Thereof. Patent Number: 4,788,062. November 29, 1988.

PUBLICATIONS & PRESENTATIONS

Libicki, S.B. 2019. "Using Dispersion Modeling and Monitoring as a Basis of Estimating Emissions from Refineries." Presented at the Refinery and Chemical Symposium. November.

Bandoro, J. T. Olevski, K. Richman, D. Hill, M. Dvorak, J. Luongo, S. B. Libicki, C. Emery, G. Yarwood. 2019. "Ramboll Shair: Integrating real-time sensor measurements and regional/local-scale models in Richmond, California." Presented at the Community Modeling and Analysis System. October.

Vijayaraghavan, K., S.B. Libicki, R. Beardsley, J. Jung, S. Ojha. 2018. "Modelling of Atmospheric Mercury Deposition in India." Published in "Urban Air Quality Monitoring, Modelling and Human Exposure Assessment." Springer Publishing.

- Nambiar, M. and S.B. Libicki. 2018. "Residential Indoor Particulate Matter Monitoring: A Comparative Study of Two Low-Cost Sensor Technologies". Presented at Air & Waste Management Association Annual Conference. Hartford. CT. June.
- Klug, S.E., K.L. Krieger, D.W. Weaver, M.T. Keinath, S.B. Libicki. 2012. "Quantifying Filtration Impacts on Indoor Exposure to Particulates." Presented at Air & Waste Management Association Conference and Exposition. June 19, 2012.
- Bowie, T.; S.B. Libicki, K.L. Davis, C. Emery. 2011. "Strategies for Designing an Odor Monitoring Program for Municipal Solid Waste Landfills." Presented at Air & Waste Management Association Conference and Exposition. June 22, 2011.
- Keinath, M.T. and S.B. Libicki. 2010. "Preventing GHG Leakage: Benchmarking Emissions to Design a Fair Cap and Trade System under AB32." Presented at the 2010 California Construction and Industrial Materials Association (CalCIMA) Education Conference. San Diego, CA. September.
- Van de Griend, R., R.W. Andersen, S.B. Libicki, J. Ilisco, U. Senturk. 2009. Arsenic In Glass Highway Marking Beads. A&WMA's 102nd Annual Conference & Exhibition, Detroit, MI. June.
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- Libicki, S.B. and R. van de Griend. 1994. Practical Compliance Strategies for Laboratory and Production: Ensuring Compliance from the Ground Up. Bio International '94. Toronto. May.

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EMILY A WEISSINGER

Senior Managing Consultant

Emily Weissinger’s work focuses on air quality engineering and regulatory compliance. She has expertise in permitting and compliance, emissions estimation, regulatory interpretation, state implementation plan development, indoor and ambient air quality sampling, air dispersion modeling, health risk assessments, and greenhouse gas reporting and compliance. In addition, she has experience with stormwater and wastewater permitting and compliance, California Environmental Policy Act (CEQA) and National Environmental Policy Act (NEPA) compliance and documentation, and technical support in matters involving litigation.



EDUCATION

2014-2015

MSE, Civil, Environmental, & Sustainable Engineering

Arizona State University, Tempe, AZ

2004-2009

BSE, Civil and Environmental Engineering

Princeton University, Princeton, NJ

COURSES/CERTIFICATIONS

Professional Engineer, Arizona

LEED Accredited Professional

40-hour OSHA HAZWOPER

EXPERIENCE HIGHLIGHTS

Corporate Air Quality Permitting and Compliance Assistance

Has provided corporate air quality compliance assistance to clients across a multitude of commercial and industrial sectors including mining, oil and gas, data centers, and manufacturing. Services provided have included permitting, compliance reviews, emissions estimation, indoor and ambient air quality sampling, and annual emission inventory and toxic release inventory reporting.

Air Quality and Health Risk Assessments

Has assisted in the development of multiple air quality and health risk assessments for commercial developments and large-scale infrastructure projects. Individual responsibilities have included quantifying emissions, human exposure, and health risks through the use of various emission factor models as well as Microsoft Access, ArcGIS, HARP2, and AERMOD.

CONTACT INFORMATION

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Greenhouse Gas Reporting and Compliance

Has provided technical support related to greenhouse gas emissions estimation, compliance, and reporting, including the development of greenhouse gas monitoring plans and the annual reporting of emissions through the United States Environmental Protection Agency's Electronic Greenhouse Gas Reporting Tool. Has also contributed to the development of climate action plans for industry and local government.

State Implementation Plan and Emission Inventory Development

Has assisted multiple air agencies in the development of state implementation plans for National Ambient Air Quality Standards (NAAQS), a requirement under the Clean Air Act. Individual responsibilities have included inventory development, data processing, regulatory analyses, control measure analysis, inter-agency consultation, public outreach, and comprehensive report writing.

Fugitive Dust Control

Has provided strategic assistance to numerous industries for the control of fugitive dust sources. This work has included authoring fugitive dust control plans, developing and testing innovative dust control measures, and performing comprehensive reviews of dust-related air quality regulations to facilitate strategic planning.

Carbon Market Assistance

Has provided strategic greenhouse gas cap and trade compliance assistance to multiple industries seeking to understand and comply with the existing California cap and trade regulation, as well as plan for potential future regulations. This has included reviewing current and proposed regulations and distilling key information for company executives, providing bid advisory services for clients participating in cap and trade auctions, and overseeing calculations related to third-party verification of greenhouse gas offsets for use in California's cap and trade program.

Sustainable Design and Operation

Has provided technical support to multiple industries seeking greater sustainability in their operations. This has included developing the documentation and calculations necessary for the successful LEED certification of new construction, as well as auditing energy, water, and waste profiles of existing operations and providing recommendations for improvement.

Stormwater and Wastewater Compliance

Has assisted various industrial facilities in meeting their stormwater and wastewater compliance obligations. Individual tasks have included permit renewals, stormwater sampling, facility inspections, annual and semi-annual reporting, as well as stormwater pollution prevention plan (SWPPP) development and updates.