



Christina J. Schwerdtfeger, Ph.D. Coto Consulting, Inc.

AREAS OF EXPERTISE

- GHG Compliance and Verification
- 3rd Party Verification - Sustainability Reports
- EHS Auditing
- ISO 14001 and OHSAS 18001 Certification
- Strong Program and Management Skills
- Multi-Media Compliance Experience
- Regulatory Agency Negotiations
- Teamwork with Multiple Stakeholders
- Strong Writing and Speaking Skills

EDUCATION

Rutgers University: BA, Chemistry, 1983
University of Southern California: PhD, Chemistry, 1987

REGISTRATIONS AND CERTIFICATIONS

Lead EMS Auditor for ISO 14001:2015, RABQSA Certificate No. 121210
Lead SMS Auditor for OHSAS 18001
GHG Lead Verifier, California Air Resources Board (ARB) Executive Order H-15-125
GHG Lead Offset Verifier, ARB, Executive Order H2-12-139

EMPLOYMENT HISTORY

Member of Technical Staff, Hughes Aircraft Company, 1987-1989
Environmental Specialist, Northrop Grumman, 1990-1991
Radian International, Senior Scientist, 1991-1999
Regional Project Delivery Manager, CH2M HILL, 1999-2006
Program Manager, EM-Assist, 2006-2007
Federal Services Manager, E2 ManageTech, 2007-2009
President, Coto Consulting Inc., 2009-present

REPRESENTATIVE EXPERIENCE

Christina Schwerdtfeger has 30 years experience as an environmental, health and safety (EHS) professional in multi-media compliance and sustainability. Christina is accredited by RABQSA as a Lead Auditor for ISO 14001:2004 and ISO 14001:2105 and has performed audits in accordance with the OHSAS 18001 standard. She is also a greenhouse gas (GHG) lead verifier who is accredited by the California Air Resources Board.

Her strengths include: auditing, regulatory compliance, strategic planning, sustainability, pollution prevention, agency negotiations, regulatory interpretations and exemptions, and program management.

Program Management Examples:

- For Marine Corps Base (MCB) Camp Pendleton, Dr. Schwerdtfeger served as Program Manager for a \$3 million IDIQ contract to support the Comprehensive Environmental Training and Education Program (CETEP).
- For Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, Dr. Schwerdtfeger served as Program Manager to help the Environmental Management System (EMS) Coordinator and CETEP Coordinator put procedures and tools in place to meet requirements from Headquarters



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Marine Corps (HQMC). This contract was funded at \$400,000 and took 18 months to complete all tasks.

- While employed at CH2M HILL, Dr. Schwerdtfeger served as the Regional Project Delivery Manager (PDM) and Vice President for 4 years. She managed a regional staff of 30 project managers and had profit and loss responsibility for her business unit. She prepared the annual business plans and reported a variety of financial metrics monthly, quarterly and annually to the Senior Vice President.

3rd Party Verification Services

- Dr. Schwerdtfeger received accreditation from the California Air Resources Board (ARB) under Executive Order H-12-163 as a GHG lead verifier to provide verification services as a specialist for oil & gas emissions, process emissions and transactions. She is also accredited by ARB as a lead verifier for carbon offsets projects and is a specialist for the livestock, urban forests and ozone depleting substance protocols.
- Performed 3rd party greenhouse gas verifications for over 50 facilities: power plants, refineries, natural gas compressor stations, drinking water supplier, pharmaceutical company, telecommunications company, dairy product manufacturer, chemical manufacturers, and news media company. These included: San Diego Gas & Electric, Pacificorp, NV Energy, Johnson & Johnson, San Diego Union Tribune, Seattle Public Utilities, Agri-Mark, International Flavor & Fragrance, Sunshine Makers Inc., Commonwealth Property Management, Xcel Energy and Southern California Gas Company.
- Provided 3rd party verification to companies that publish Sustainability Reports in the public domain using GRI, GRESB or CDP protocols. These included: 3M, International Flavor & Fragrance, Sunshine Makers Inc., Sempra and Commonwealth Property Management.

Climate Change Project Examples:

- For ExxonMobil and XTO Energy, Dr. Schwerdtfeger assisted with the creation of data collection systems and tools for over 30,000 onshore oil and natural gas production and processing facilities to support reporting to EPA under Subpart W of the GHG mandatory reporting rule. Her role has been to: provide senior level and quality assurance review of the data collection forms and equations; prepare GHG Management Plans; interpret new regulations for CARB and interface with agency personnel; prepare written requests for postponement; provide recommendations to upgrade equipment and operating procedures; and review GHG inventory prior to submittal on Cal e-GGRT.
- For Hexacomb Corporation, Dr. Schwerdtfeger completed a greenhouse gas (GHG) assessment to verify that the facility fell below the 25,000 metric ton threshold for reporting under Assembly Bill (AB) 32. Dr. Schwerdtfeger calculated carbon emissions from stationary combustion sources and indirect electricity usage using emission factors and protocols established by the California Climate Action Registry and regulations proposed by the California Air Resources Board (CARB).
- For Marine Corps Installations West (MCIWEST), Dr. Schwerdtfeger prepared a comprehensive GHG inventory and strategic plan. The objective was to create a stream-lined technical approach for quantifying GHG emissions and determine whether reporting is required under AB 32, EPA's MRR and EO 13514. This project also identified applicable early action measures, future GHG reductions and previous GHG reductions. Created a GHG Inventory Management Plan for the Las Pulgas Landfill. Dr. Schwerdtfeger co-presented her findings on this project with MCIWEST personnel at the 2009 Federal Environmental Symposium. This study included eight bases in the Southwest United States:



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- MCAS Yuma (including Main Base, Cannon Complex and Camp Billy Machen)
 - MCB Camp Pendleton
 - MCAS Camp Pendleton
 - MCLB Barstow
 - MCAGCC Twentynine Palms
 - MCAS Miramar
 - MCRD San Diego
 - MCMWTC Bridgeport
- For EPA's laboratories in Research Triangle Park, Dr. Schwerdtfeger evaluated the use of laboratory chemicals, research gases and refrigerants with high global warming potential. Quantified the use of each chemical for reporting under EO 13514.
 - For MCIWEST, developed a management strategy and plan for the use and management of high GWP refrigerants and SF₆ at eight bases to comply with new regulations in California and at the federal level. Developed a training module to assist HVAC&R personnel with understanding the requirements in layman's terms. Oversaw field work to inventory equipment in the field. Served as a subject matter expert (SME) for the creation of an in-house web-based recordkeeping tool.
 - For Jerry Leigh Apparel (JLA), quantified and reported Scope 1 and 2 GHG emissions for submittal to the Carbon Disclosure Project to assist with meeting the requirements of Walmart's Supplier Sustainability Program. Calculated GHG intensities going back to 2008 in order to assess overall performance and identify GHG reductions. In 2012, the GHG baseline was recalculated due to the addition of a large operation in Mexico.
 - For DOI's Office of Environmental Policy and Compliance (OEPC), evaluated the GHG emissions from fugitive sources including landfills, refrigeration systems, SF₆ and wastewater treatment from nine bureaus and wrote portions of the GHG Inventory Management Plan for:
 - Bureau of Indian Affairs
 - Bureau of Land Management
 - Bureau of Ocean Energy Management, Regulation and Enforcement
 - US Fish & Wildlife Service
 - National Business Center
 - National Park Service
 - Office of Surface Mining, Reclamation and Enforcement
 - Bureau of Reclamation
 - US Geological Survey
 - For Plains All American Pipeline, Dr. Schwerdtfeger served as a team member to assess the GHG impacts of a new pipeline and AST construction project. Dr. Schwerdtfeger identified the GHG assumptions and oversaw the completion of the detailed calculations. She also performed an analysis to determine the current regulatory requirements and upcoming actions from the Governor's Office of Planning and Research (OPR) under Senate Bill 97 pertaining to the California Environmental Quality Act (CEQA) and establishing GHG significance levels.
 - Under attorney-client privilege, Dr. Schwerdtfeger identified several options to offset the carbon emissions from a large new construction project in the Southern California area. She evaluated the cost, technical feasibility, public relations impact and risks of each option. Detailed analyses were



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completed for: an urban tree planting program, photovoltaic systems, and purchase of carbon offsets through a broker.

- Served as the third party senior reviewer on the San Pedro Waterfront project to review GHG estimates, assumptions and mitigation measures in the Draft Environmental Impact Report (DEIR). This project is being proposed by the Port of Los Angeles to improve the public waterfront and open space areas, expand the cruise ship facilities and operations, expand commercial development and improve local transportation and parking. The construction is expected to take 7 years.
- Served as the regulatory analyst for a confidential company to participate in CARB workshops on GHG reductions and AB32 implementation. Dr. Schwerdtfeger listens to the regulatory proposals and opinions, feedback and questions from other participants, summarizes the regulatory actions and technical issues, and develops a summary report to identify potential impacts to the client's operations and future plans.
- Hosted and led online webinars to assist current and potential customers to understand the impact of climate change on their operations. Typical webinar titles were: "Calculating Your Carbon Footprint: Relief is on the Way!" and "Carbon Trading – What are the Potential Impacts to my Firm?"
- For MCI West, Dr. Schwerdtfeger evaluated the impact of EPA's proposed rule for mandatory reporting of GHGs on eight bases. This effort includes recalculating GHG emissions from an earlier GHG inventory, calculating methane emissions from landfills using the IPCC model, identifying and analyzing differences between the state and federal programs, and developing a compliance strategy.
- For the Los Angeles/Orange County Environmental Training Center (ETC), Dr. Schwerdtfeger developed and presented in a 4-hour course entitled *GHG Compliance: Reality vs. Myth* in 2009. After the success of this initial course, ETC was awarded a grant through the chancellor's office to develop an expanded version of the course which is titled *GHG Reporting: Reality vs. Myth*. The course was offered in 2012 and 2013.
- From 2010-2015, continuing to provide regulatory support, analysis and interpretation to MCIWEST to assess the impact of new regulations on activities at eight bases. Studies were completed and results were summarized in technical memoranda on the following topics:
 - Applicability Determination for Mandatory Reporting of GHGs to ARB for 10,000 MT Threshold
 - Applicability of New SF₆ Rules to MCIWEST
 - Refrigerant Unit Inventory and Assessment Report for MCIWEST
 - Evaluation of Boilers for Mandatory Reporting for Calendar Year (CY) 2011
 - Evaluation of Microturbines and Their Impact on GHG Reporting

Sustainability Project Examples

- Dr. Schwerdtfeger has provided third party assurance to clients who publish sustainability reports or sustainability data in accordance with voluntary reporting mechanisms such as:
 - Company website
 - Global Reporting Initiative (GRI)
 - Carbon Disclosure Project (CDP)
 - Global Real Estate Sustainability Benchmark (GRESB)



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Assurance efforts have been in conformance with AA1000AS and ISO 14065 and typically include environmental and safety KPIs such as: GHG emissions, water consumption, water discharges, waste disposal, recycling, air emissions, fines/NOVs, releases, injury and illness rates, etc.

Clients have included:

- International Flavors and Fragrance
 - Minnesota Mining and Manufacturing Company (3M)
 - Sempra
 - Sunshine Makers, Inc.
 - Jamestown, LP
 - General Growth Properties, Inc.
 - Parkway Properties, Inc.
 - Commonwealth Property Management
 - Mars Inc. – Victorville, CA
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- Developed a customized 4-hour course for a confidential client called “Sustainability and the ESH Strategic Direction”. This included a lecture, interactive exercises and customized examples to match the client’s operations and sustainability program.
 - For Jerry Leigh Apparel, quantified sustainability metrics for reporting to Walmart’s Supplier Sustainability Program: Scope 1 and 2 GHG emissions, water use and solid waste diversion. Prepared and submitted corporate responses and strategy to CDP website.
 - For MCB Camp Pendleton, Dr. Schwerdtfeger served as PM to evaluate the base’s progress towards the DOD’s Measures of Merit. (This was the DOD’s policy for its first sustainability program that contained numerical goals.) The key performance indices (KPIs) addressed: hazardous waste generation, release of toxic chemicals, disposal and recycling of non-hazardous waste, and acquisition of alternatively fueled vehicles. Dr. Schwerdtfeger collected data to quantify and assess the ongoing practices at the base. She demonstrated for the first time that the base was exceeding the waste reduction goals mandated by the DOD. MCB Camp Pendleton has received numerous awards from the Secretary of Defense for its environmental stewardship.
 - As the first step in Northrop Corporation’s sustainability program, Dr. Schwerdtfeger developed a comprehensive waste management program which advocated a proactive 90% reduction of hazardous waste and toxic air emissions within 6 years. She created a policy statement and corporate-wide goals which were signed by the CEO and approved by the Board of Directors. Within 6 years, Northrop had exceeded its goals and received numerous state and federal awards for its innovation and environmental stewardship.
 - The second step in Northrop Corporation’s sustainability program was to institute paper recycling measures for the corporate office and track non-hazardous waste recycling efforts in California. Dr. Schwerdtfeger worked with the public relations department to create a colorful coffee mug with the logo, “Northrop is Proud to Recycle, Reuse and Reduce”. She also developed an employee communication plan with a series of articles and pictures in the *Northrop News* featuring the CEO, herself and other employees involved in these sustainable business practices.
 - For MCIWEST, completed a Gap Analysis for Executive Orders (EO’s) 13423: Strengthening Federal Environmental, Energy and Transportation Management. This is the federal government’s current policy that was issued in 2007 that contains metrics on sustainability. The EO covers: use of



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alternative vehicles, petroleum conservation, use of alternative fuels, energy efficiency, GHGs, renewable power, building performance, water conservation, procurement of environmentally-sound goods, electronics management (recycling and Energy Star), environmental mgmt systems. This assessment was expanded to include EO 13514: Federal Leadership in Environmental, Energy, and Economic Performance.

- Completed an inter-industry benchmark survey to determine the use of information systems in tracking and reporting sustainability metrics. Created a web-based survey and collected results on-line from companies over a two-month period. The respondents were responsible for over 44,000 sites in the United States and Canada, with annual revenues ranging from \$231 million to \$179 billion. Forty-eight percent of the respondents were on the Fortune 1000 list of companies. Based on the results of this study, Dr. Schwerdtfeger published "A Benchmark Study of Current Practices and Tools for Sustainability" in *Environmental Management*, a publication of the Air & Waste Management Association in October 2008.
- Created a 6-week online course for University of California Irvine called "Sustainability Reporting: Drivers, Protocols and Quantitative Methods" which was taught annually from 2009 to 2011.

Environmental Management Systems

- Currently serving as the Senior Certified EMS Manager for County of Los Angeles Metropolitan Transportation Authority (LA Metro) on the 4-year Sustainability Program and Support (SPAS) Contract as a subcontractor to Cumming Construction Management, Inc. Dr. Schwerdtfeger's strengths include: understanding both sides of EMS -- development, implementation and maintenance of the EMS vs. certification and auditing. Dr. Schwerdtfeger is especially knowledgeable about ISO 14001 and helped LA Metro to modify its EMS to remain certified in accordance with ISO 14001:2015.
- Conducted over 50 EMS audits throughout the United States to support client's initial or continued certification under ISO 14001.
- Prepared and taught modules on EMS certification and auditing in classes taught at University of California Irvine and Evergreen Safety Council.
- For MCIWEST, oversaw the creation of over 100 environmental standard operating procedures to support their EMS program and an internal conformance deadline with the Department of the Navy.
- For Eastern Municipal Water District (EMWD), Dr. Schwerdtfeger deconstructed 200 air quality permits for input into the environmental management information system (EMIS). EMWD wished to assign specific action items and deadlines to individuals in order to maintain compliance with over 1,800 discrete requirements in these permits.
- For MCIWEST, compiled objectives and targets for eight bases by evaluating applicable Executive Orders, internal policies from numerous federal departments, and regulatory requirements. The objectives and targets were loaded onto the Sustainability Management System.

Occupational Health & Safety (OSH) Audits

- As a contractor working for Lloyd's Register Quality Assurance, Dr. Schwerdtfeger completed numerous occupational safety and health (OSH) audits in accordance with the OHSAS 18001:2007 standard.



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- As a contractor working for Lloyd's Register Quality Assurance, Dr. Schwerdtfeger completed numerous occupational safety and health (OSH) audits in accordance with Coca Cola's internal KORE audit protocol at Coca-Cola bottling and syrup facilities and non-strategic co-packers in the United States. These detailed audits covered risk assessment, evaluation of regulatory and legal compliance, training, operational controls, and inspection and maintenance activities. OSH topics which were evaluated included: machine guarding, lift trucks, material handling, management of hazardous materials, personal protective equipment, fall protection, respiratory protection, hot work, electrical safety, fire protection, control of energized equipment, hearing conservation, first-aid, compressed gases, fleet vehicles, traffic control, and corrective actions.

Audits also required collection and evaluation of each facility's annual number of OSHA recordable injuries and the OSHA injury rate and for comparison to the US national average rate of 5.3. Audits also evaluated the accident investigation and corrective action program for effectiveness at each facility. EOSH performance was determined as well, which requires tracking of: number of employees, hours worked, fatalities, lost time incidents, lost days, medical treatment cases, notices of violations, fines/penalties/restitution, and annual goal for lost time incidents.

- As a contractor working for Lloyd's Register Quality Assurance, Dr. Schwerdtfeger served as a team member on integrated audits of environmental, safety and quality management systems. In conjunction with other auditors on the team, she reviewed and assessed the self-governance elements such as management reviews, internal audits, corrective and preventive action. Prepared written reports and wrote findings in accordance with applicable ISO standards.
- As a contractor working for Lloyd's Register Quality Assurance, Dr. Schwerdtfeger performed ISO 14001 audits which required evaluation of USEPA and state environmental regulations which have a strong OSH and risk prevention component during the EMS evaluations of a confidential vineyard and Coca-Cola facilities:
 - California Accidental Release Prevention Program (Cal-ARP) for ammonia refrigeration systems
 - Risk Management Program per USEPA for ammonia refrigeration systems
 - Process Safety Management (PSM)

Occupational Health & Safety (OSH) Projects

- For Westech, Dr. Schwerdtfeger evaluated new regulatory requirements by OSHA and provided recommendations for hazard communication per the Global Harmonization System as related to a Safety Data Sheet and the facility's Hazard Communication Plan.
- For Air Force Plant 70 in Sacramento, Dr. Schwerdtfeger evaluated the chemical and health hazards from a demolition activity adjacent to a tank and piping that contained nitrogen tetroxide. This rocket fuel propellant had been used in a rocket test stand, which was undergoing demolition. The Air Force needed to vacate the site and remove all concrete and chemical contaminants from the soil. Dr. Schwerdtfeger worked with the construction crew and industrial hygiene staff to develop a mutually agreeable approach for demolition which protected workers from potential leaks of this chemical, which could have been imminently dangerous to health and safety.
- For CH2M HILL Constructors Inc., ensured that appropriate H&S training was provided to personnel who were involved in construction; evaluated risks and completion of Health & Safety Plans (HSPs) for numerous Air Force clients; and coordinated with Corporate Health & Safety Managers.



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- For CH2M HILL Constructors Inc., while serving as Project Delivery Manager (PDM) and Vice President at this major environmental engineering company, Dr. Schwerdtfeger assisted with implementation of the Behavior Based Loss Prevention System (BBLPS) which included: required completion of job hazard analyses (JHAs), loss prevention observations (LPOs) and near-loss investigations (NLIs). I was responsible for organizing the classroom portion of the BBLPS training and ensuring that all construction employees had completed the online learning modules and quizzes.
- For Hughes Aircraft Company, analyzed industrial hygiene samples (i.e., charcoal tubes, vapor badges and impinger solutions) in the Manufacturing Process Laboratory to assess employees' exposure to hazardous chemicals versus acceptable levels established by NIOSH. Worked jointly with personnel in the Safety Health and Environmental Affairs (SHEA) Department to complete these assessments. Organized 40-hour HAZWOPER training for maintenance personnel; participated in fire extinguisher training and review of emergency response procedures; participant in emergency evacuation of building and coordination with local fire department personnel.
- For Chevron El Segundo Refinery, evaluated annual changes to California's Office of Environmental Health Hazard Assessment (OEHHA) list of Proposition 65 chemicals (per the Safe Drinking Water and Toxic Enforcement Act of 1986). Dr. Schwerdtfeger reviewed the list of chemicals for Chevron El Segundo Refinery, calculated the quantities of chemicals released to water and air and identified cancer risk levels to determine whether written notifications were required to employees or neighbors to warn about potential exposures to carcinogens.
- For Northrop Corporation, Dr. Schwerdtfeger assisted with the development of a corporate-wide program to implement Air Toxics Hot Spots (AB 2588) consistently throughout all California facilities. She helped develop to identify the regulated chemicals, calculate the quantities released, and prepared the air toxics emission inventory plans (ATEIPs) for submittal to regulators.
- For MCIWEST, Dr. Schwerdtfeger assisted with the implementation of Presidential Executive Order (EO) 13514 (Federal Leadership in Environmental, Energy, and Economic Performance) for eight military bases located within Marine Corps Installations West including:
 - Reduce and minimize the quantity and toxicity and hazardous chemicals acquired, used or disposed
 - Report in accordance with the Emergency Planning and Community Right-to-Know Act of 1986
 - Measure performance versus targets and objectives
 - Prepared the Draft Base Order for Assistant Chief of Staff, Environmental Security with the intention of obtaining signature by the Commanding General to implement EO 13514
- For MCIWEST, evaluated the US Supreme Court's "Endangerment Finding" issued in December 2009 for greenhouse gases that they threaten public health and welfare of current and future generations vs. impacts on MCIWEST's operations.
- For Hexacomb Corporation, Dr. Schwerdtfeger serves as PM for air quality permitting and regulatory support. Dr. Schwerdtfeger testified in front of the SCAQMD Hearing Board on two occasions for Hexacomb, obtained six permits, developed voluntary operating limits for hazardous air pollutants (HAPs), and prepared the annual emission reports (AERs) since 1999. Hexacomb continues to rely on her as a key member of their team with knowledge of their operations and history with SCAQMD. One of the key projects in 2003 was estimating the emission of hazardous air pollutants, conducting air dispersion modeling for a health risk assessment, and including the results in the permit applications in conformance with Rule 1401. Key parameters calculated were: the acute and chronic



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health hazard indices (HHIs), maximally exposed individual at a workplace (MEIW), and individual lifetime cancer risks for the residential receptor. These were compared to reference exposure levels (RELs). The HRA was updated and included in recent permit applications in 2013 and 2014.

- For Naval Facilities Engineering Command Southwest Division, Dr. Schwerdtfeger prepared health & safety plans (HSPs) prior to initiating field work for task orders to be completed at Navy and Marine Corps installations. HSPs were a contractual requirement before any type of environmental project could be initiated. HSPs included an identification of on-site activities, potential risks, required PPE, first-aid and emergency procedures, location of nearest medical facilities and other relevant information.

Construction Projects:

- Dr. Schwerdtfeger served as the Southwest Regional Project Delivery Manager for CH2M HILL Constructors Inc. and oversaw 30 project managers and multiple construction contracts provided by: Air Force Center for Environmental Excellence, Pacific Gas and Electric, and Los Angeles County Metropolitan Transportation Authority. Construction projects included:
 - Clean construction projects at Station JM (numerous Air Force buildings)
 - Decontamination & demolition of a rocket test facility at Air Force Plant 70 in Sacramento, CA
 - Decontamination and demolition of base housing at MCAS Tustin, CA.
 - Runway lighting upgrade at Air Force Plant 42 in Palmdale, CA
 - Decontamination of the Bus Rapid Transitway for LA Metro in San Fernando Valley, CA
 - EMS audits of Aggregate Industries (Las Vegas, Fargo and Denver) including cement plants and construction sites.

Air Quality Project Examples:

- For a confidential client, Dr. Schwerdtfeger researched air quality rules and regulations promulgated by SCAQMD and CARB for locomotives, rail yards and movement of goods. Her findings were incorporated into the client's final report to identify current and upcoming emission control requirements for NO_x and diesel particulates, as well an implementation and compliance schedule.
- For Hexacomb, Dr. Schwerdtfeger served as PM for air quality permitting and regulatory support. Dr. Schwerdtfeger testified in front of the SCAQMD Hearing Board on two occasions for Hexacomb, obtained six permits, developed voluntary operating limits for hazardous air pollutants (HAPs), and prepared the annual emission reports (AERs) since 1999. Hexacomb continues to rely on her as a key member of their team with knowledge of their operations and history with SCAQMD.
- For Marine Corps Air Station (MCAS) Yuma, Dr. Schwerdtfeger served as PM for air quality support. This included inventorying all stationary and fugitive emission sources, preparing an air quality permit, conducting a hazardous material inventory, and preparing the EPCRA 312 and 313 submittals. Dr. Schwerdtfeger was able to obtain a NESHAP Permit Shield and avoid Title V by proposing and obtaining voluntary operating limits for MCAS Yuma. Dr. Schwerdtfeger also obtained an exemption from ADEQ for 400 non-road engines by providing regulatory precedents from other states and a technical justification to support changing the regulatory status of tactical ground support equipment.
- For Northrop Corporation, Dr. Schwerdtfeger assisted with the development of a corporate-wide program to implement Air Toxic Hot Spots (AB 2588) consistently throughout all California facilities. She helped develop the air toxics emission inventory plans (ATEIPs).



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- For Plains All American pipeline, Dr. Schwerdtfeger participated in webcasts by CARB for rule-making on Reducing Emissions from Diesel-Fueled Auxiliary Engines on at-Berth Ocean-Going Vessels and summarized the impacts for her client and legal counsel.
- For Hughes Aircraft Company, Dr. Schwerdtfeger completed the EPCRA 313 submittals for the Toxic Release Inventory at the Torrance facility.
- For Northrop Corporation, Dr. Schwerdtfeger assisted with the development of a corporate-wide program to implement Air Toxic Hot Spots (AB 2588) consistently throughout all California facilities. She helped develop the air toxics emission inventory plans (ATEIPs).
- For a large airline, Dr. Schwerdtfeger completed an application to register one and cancel several portable engines used as ground support equipment. She also served as the PM on the annual emission inventory report for this client.
- Served as the regulatory analyst for a confidential company to participate in CARB workshops on proposed air quality regulations. Dr. Schwerdtfeger listened to the regulatory proposals and opinions, feedback and questions from other participants, summarized the regulatory actions and technical issues, and developed a summary report to identify potential impacts to the client's operations and future plans.
- For Naval Facilities Engineering Command Southwest Division, Dr. Schwerdtfeger served as PM for eighteen (18) ozone depleting substance (ODS) surveys and elimination plans over a 6-year period. The Navy and Marine Corps installations were under an aggressive schedule to comply with requirements from the Secretary of the Navy to eliminate Class I ODSs by December 31, 1999. She surveyed thousands of heating, ventilation, air conditioning and refrigeration (HVAC&R) and total flooding fire suppressions systems to determine the use of Class I and II ODSs in tactical and non-tactical operations. She also evaluated the use of ODSs in aerosol sprays, paints, coating and degreasing chemicals under a fugitive source category called "miscellaneous material use".
- For Plains All American Pipeline, Dr. Schwerdtfeger reviewed emission estimates and calculations for a Draft Environmental Impact Report (DEIR) being prepared by the Port of Los Angeles for the construction of Pier 400. This new facility will increase the amount of petroleum products available to local refineries in Southern California.
- For a confidential client, Dr. Schwerdtfeger reviewed regulations and identified applicable requirements and constraints for operations under consideration: hot-ironing of ship engines; locomotives and switchyards; short-term emission reduction credits (STERCs); and feedstream analysis for possible use as fuels in a MSW incinerator. Each regulatory analysis was summarized and delivered as a short technical memorandum.
- Served as the Subject Matter Expert (SME) for development of two computer-based training (CBT) courses at MCI West – Air Quality Course and Refrigeration Management Course.
- Providing confidential support to a manufacturer in Southern California to expand their manufacturing operations, modify their permits with the local air pollution control district, and address criteria pollutants which had not been identified in previous permitting efforts.

Hazardous Waste/RCRA Project Examples:

- For Chevron, Dr. Schwerdtfeger served as PM for the Part B permit for the landfarm post-closure project. She oversaw a team that prepared this enormous permit application in less than 90 days to meet a Correction Action Order issued by DTSC. Subsequently, this project required the evaluation of



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over 20 years of soil, groundwater and soil-pore liquid monitoring data to identify statistically significant evidence of a release (SSER) per Title 22 of the California Code of Regulations.

- For Edwards Air Force Base (AFB), Dr. Schwerdtfeger prepared a Part B permit application to expand the operations at the Conforming Storage Facility. Edwards AFB used this building to collect and store hazardous wastes for up to one year. Dr. Schwerdtfeger completed all parts of the permit application, which was approved by DTSC. Edwards AFB was able to double its storage area as a result of this effort. There were no comments from DTSC and the permit was approved with no change on a fast-track basis.
- For Air Force Plant 70 in Sacramento, Dr. Schwerdtfeger evaluated the chemical and health hazards from a demolition activity adjacent to a tank and piping that contained nitrogen tetroxide. This rocket fuel propellant had been used in a rocket test stand, which was undergoing demolition. The Air Force needed to vacate the site and remove all concrete and chemical contaminants from the soil. Dr. Schwerdtfeger worked with the construction crew and industrial hygiene staff to develop a mutually agreeable approach for demolition which protected workers from potential leaks of this chemical, which could have been imminently dangerous to health and safety.
- For Hughes Aircraft Company, Dr. Schwerdtfeger served as the On-site Hazardous Waste (HW) Coordinator for the Torrance facility. Dr. Schwerdtfeger managed all aspects of the HW Yard and coordinated with various TSDFs for disposal. Dr. Schwerdtfeger was able to bring the facility into compliance with federal and state requirements very quickly.

Site Investigation/Remediation Project Examples:

- For the Bank of America, Dr. Schwerdtfeger oversaw the development of a closure plan and closure cost estimate to decommission, decontaminate and dismantle the Golden West Refinery property as part of an acquisition strategy.
- For the Atchison, Topeka and Santa Fe (ATSF) Railway, Dr. Schwerdtfeger served as the Project Chemist on the cleanup of lead in the Arroyo Seco Park in Los Angeles. Dr. Schwerdtfeger recommended sampling methods, evaluated the analytical data, performed correlation analyses and identified areas for excavation to the PM and client.
- For the County of Los Angeles, Metropolitan Transportation Authority (MTA), Dr. Schwerdtfeger served as the Project Chemist on the Bus Rapid Transitway (BRT) construction project. This project required the evaluation of hundreds of analytical results for lead and arsenic along a 14-mile corridor being proposed as the new BRT. Dr. Schwerdtfeger identified hotspots requiring immediate excavation and negotiated with DTSC to establish cleanup goals under an aggressive deadline and to counteract adverse publicity about MTA in *The Los Angeles Times*.
- For the Grossmont Unified School District, Dr. Schwerdtfeger served as the project chemist to assist with a complicated soil gas issue with 1,3-butadiene on four school properties undergoing construction. She provided technical information to the project team about the analysis and detection of this chemical which is not normally found in soil or groundwater. Participated in discussions between the client, DTSC and the analytical laboratories to agree upon acceptable analytical methodologies and detection limits.

Water and Wastewater Project Examples:

- For Hughes Aircraft Company, analyzed sludge and wastewater samples prior to discharge to local publically owned treatment works (POTW)



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- Oversaw junior staff and served as peer reviewer to evaluate drinking water quality and treatment requirements for Lockheed Martin's Palmdale facility
- Oversaw a subcontractor at Marine Corps Recruit Depot who was performing an assessment of the potable water system for compliance with California laws and regulations.
- For Dow, Dr. Schwerdtfeger served as PM to obtain a NPDES permit for the discharge of treated rainwater to the Pacific Ocean. Dow needed a permit from the Los Angeles Regional Water Quality Control Board for operational changes to reduce their costs.
- For Chevron El Segundo Refinery, determined compliance with Proposition 65 and public notification requirements for discharges from the wastewater treatment plant into the Pacific Ocean via the facility's outfall pipe.

Emergency Planning Project Examples:

- For MCB Camp Pendleton, Dr. Schwerdtfeger served as PM for the Integrated Contingency plan (ICP) and Spill Prevention and Countermeasures Control (SPCC) Plan. This was a landmark effort to consolidate and streamline various plans and emergency procedures into a single document. MCB Camp Pendleton needed a comprehensive survey of all ASTs and USTs containing POLs plus certification by a professional engineer. The ICP followed EPA guidance and was a comprehensive document that eliminated numerous stand-alone plans. The ICP included elements of Kinder Morgan's emergency response plan, since this pipeline runs through the Camp Pendleton property, as well as copies of Mutual Aid Agreements with local cities.
- For MCB Camp Pendleton, Dr. Schwerdtfeger served as the PM to develop several web-based tools: Business Plan Management System (BPMS) and GIS/Facility Information Management (FIM) System. These tools allow USMC personnel to create and store over 180 business plans in a single location in a standard format. The GIS/FIM tool contains 26 GIS layers which pertain to environmental issues or operations and allowed for easy mapping of impacted areas.

Attorney and Litigation Support Project Examples:

- Testified in front of the SCAQMD Hearing Board on two occasions in support of Hexacomb Corporation's requests for variances and assisted the legal team (Latham & Watkins and Jenner & Block) with defense and settlement negotiations related to a notice of violation.
- Provided technical support to Ameron with regard to a legal dispute over residual contamination at a property formerly leased by Ameron. Developed a timeline and maps from existing documents to prove contradictions in the plaintiff's claims.
- Provided technical support to legal counsel (Brownstein Hyatt Farber Schreck LLP) in a toxic tort case for a confidential client. Researched available data and potential sources of chemical exposure to assist with the creation of a timeline and GIS map related to the plaintiff's whereabouts. Also reviewed the client's health risk assessment and air toxics emissions inventory report (ATEIR) to identify areas of concern and assess the validity of the facility's assumptions, technical approach and calculations.
- Provided third party expertise for the identification, characterization and disposal of 20,000 ultra-capacitors (UCs) and other hazardous wastes during a bankruptcy proceeding. Assisted a potential purchaser and their legal counsel (Sheppard Mullin Richter & Hampton, LLP) to evaluate the potential environmental liability and associated cost of acquiring the assets of a company that developed, manufactured and distributed heavy-duty battery hybrid drive systems and energy storage systems.



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- Participated in rule-making sessions with the California Air Resources Board related to greenhouse gases and shore power for ocean-going vessels (“cold ironing”) to identify impacts to a petroleum client’s operations. Prepared written summaries for the client and legal counsel (Weston, Benshoof, Rochefort, Rubalcava, MacCuish LLP).
- Provided technical support to a shipping company and their legal counsel (DeOrchis & Partners) during an appeals process to recover damages paid as a result of shipping and delivering cargo from the United States to a European destination that was contaminated with hydrofluoric acid.
- Upon request by legal counsel, provided technical support to a confidential refrigerant distributor about compliance with new California regulations concerning high global warming potential refrigerants. Several years prior, the owner had been convicted of illegally importing refrigerants in another state. The owner needed legal and technical assistance to avoid any compliance or legal problems while operating in the State of California.

Auditing Project Examples:

- For LRQA, Dr. Schwerdtfeger is conducting EMS assessments for clients located in the United States to assist with their initial and/or continued certification under ISO 14001. She conducted over 50 audits in 2013 -2015.
- For a global beverage company, Dr. Schwerdtfeger conducted over thirty 2nd party compliance audits at facilities in the United States and Canada. These audits use the client’s auditing protocols and reporting tools which cover all aspects of their operations which have environmental impacts.
- For Chevron, Dr. Schwerdtfeger was the Project Manager on a multiple year program where approximately 100 TSDFs were evaluated to determine their financial stability, operational procedures and the potential for on-site contamination. She performed audits herself and oversaw junior staff to determine Chevron’s risk associated with the long-term use of treatment, storage and disposal facilities (TSDFs).
- Dr. Schwerdtfeger audited several facilities in Southern California for Ameron to determine their compliance with federal, state and local environmental regulations. These sites manufacture concrete pipes and streetlight poles.
- Hill Pet Nutrition requested a multi-media compliance audit to assist the EHS Manager with identifying areas of improvement.
- For an asphalt refinery in California, Dr. Schwerdtfeger served a team member for a detailed compliance audit that EPA Region IX required as part of a settlement agreement with the facility operator. She was responsible for the following audit domains: air, EPCRA and GHGs. Each finding was categorized and substantiated with photos or other documentation.
- For Lockheed Martin, Dr. Schwerdtfeger served as the PM for an “exit audit” from the 20-acre Kearny Mesa facility in San Diego which had been leased for 2 years. Dr. Schwerdtfeger was able to show that Lockheed Martin had not damaged or contaminated the property during the lease period.
- For Northrop, served as PM on a pre-lease assessment of a sealant/coating repackaging warehouse facility in Southern California. Northrop’s Electronics Systems Division wished to lease the facility and identify any potential liabilities left behind by the previous occupant.
- For Northrop, served as PM on a pre-lease assessment of 10 buildings at the Redstone Arsenal in Alabama for the Electronics Systems Division. Northrop intended to lease these buildings and needed to document previous activities and any potential liabilities from previous tenants. Of particular



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concern was the presence of explosives and energetic residuals from the previous tenant's rocket manufacturing process.

Training Project Examples:

- For MCB Camp Pendleton, Dr. Schwerdtfeger served as the Business Process Analyst for the integration of the Learning Management Portal (LMP) and Environmental Management Portal. She suggested functional changes to the client and programmers to add dashboard capability and graphical displays to illustrate the performance of the base against its targets and objectives.
- For MCAGCC Twentynine Palms, Dr. Schwerdtfeger prepared a base order for the Natural Resources and Environmental Affairs (NREA) Department and the Commanding General (CG) which outlined the roles, responsibilities, policy and requirements for the Comprehensive Environmental Training and Education Program (CETEP). Less than one month after submittal, it was signed by the CG and implemented at the base.
- For General Electric Aircraft Engines (GEAE), Dr. Schwerdtfeger served as the trainer for the introductory course on hazardous waste management.
- While serving as Project Delivery Manager at CH2M HILL, Dr. Schwerdtfeger provided regular training sessions to staff on a variety of project management topics. At least annually, she provided an intensive longer course on project financials and estimating and forecasting techniques.
- For BNSF Railway, performed a functional and user needs analysis to identify a new learning management system (LMS) for implementation. Reviewed BNSF's legacy software tools being used to manage its current training program and six commercial off-the-shelf (COTS) LMSs. Provided recommendations and cost estimates for selecting and implementing a single LMS for the entire company.
- Developed a 6-week online course for UC Irvine's Continuing Education Program called "Sustainability Reporting – Drivers, Protocols and Quantitative Methods" which was taught annually from 2009 to 2011. This is an elective course in the Sustainability Leadership Certificate Program.
- Developed and taught a 1-hour guest lecture for the Paul Merage School of Business at UC Irvine called "Sustainability and Supply Chain Management".
- Developed and delivered a 4-hour course called "*GHG Compliance: Reality vs. Myth*" for the Los Angeles / Orange County Environmental Training Center in 2009.
- Developed and taught a 4-hour course for a confidential Fortune 100 client called "Sustainability and the ESH Strategic Direction". This included lectures, interactive exercises and customized examples to match the client's operations and sustainability program.
- Developed and taught a 5-hour course for MBAs and Executive MBAs called *Key Concepts and Tools for Decision-makers*. Course was delivered at the Claremont Graduate University. Peter F. Drucker & Masatoshi Ito Graduate School of Management.
- Developed a 2-hr online course for Future Perfect called "GHG Verification – Best Practices and Basic Principles".
- Developed a ½ day course for Saddleback College's Community Education Department called "Save Money by Greening Your Business or Home" for delivery in Spring 2012.



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- Developed a 2-day course for the Los Angeles / Orange County Environmental Training Center called “GHG Fundamentals: Reality vs. Myth” which was taught twice in 2012 under a grant from the Chancellor of the California Community College’s Responsive Training Fund (RTF) Program. Course was subsequently condensed to a 1-day course for delivery in Fiscal Year 2013.
- Served as an instructor for ISOS Group, which is a certified trainer for the Global Resources Initiative’s Sustainability Reporting Course, for courses provided in San Diego and New York City.
- Provided two 1-hour videotaped lectures to UC Irvine on the topics of sustainability reporting to support their open courseware initiative and plans to provide professional development units (PDUs) to LEED-AP certified professionals through their training accreditation with the US Green Building Council.
- Developed a new 8-hour course called “Environmental Awareness Training” for Evergreen Safety Council that was taught in February 2013.

Peer Review / Advisory Roles:

- National Science Foundation, 2005. Served as reviewer of grant proposals for the Division of Chemistry’s Discovery Corps Program.
- Port of Los Angeles. Served as the third party senior reviewer on the San Pedro Waterfront project to review GHG estimates, assumptions and mitigation measures in the Draft Environmental Impact Report (DEIR). 2009.
- Served as a peer reviewer for ERG to review applications submitted to USEPA’s Small Business Innovation Research (SBIR) program in the area of Greenhouse Gases. 2011.
- Advisory Committee Member. Environmental Management Certificate Program. University of California Extension Program. 2010 to present.
- Global Reporting Initiative. GHG Emissions Working Group. G4 Development Team. 2012.
- Advisory Committee Member. Sustainability Management Certificate Program. University of California Extension Program. 2013 to present.

PRESENTATIONS/PROCEEDINGS

1. Oliphant, R. and Schwerdtfeger, C. “Solvent Substitution for Electrical Equipment Cleaning” published as Chapter 5 in *Pollution Prevention Applications for Solvent Use* (EPRI, February 1995).
2. Oliphant, R. and Schwerdtfeger, C. “Rags: California Site” published as Chapter 6 in *Pollution Prevention Applications for Noncombustion Waste* (EPRI, January 1995).
3. Oliphant, R. and Schwerdtfeger, C. “Empty Containers” published as Chapter 6 in *Pollution Prevention Applications for Noncombustion Waste* (EPRI, January 1995).
4. Schwerdtfeger, C and McHenry, J. “The Permitting and Regulatory Nightmares of Using EPA Method 24 to Determine the VOC Content of Water-Based Coatings and Adhesives.” *Proceedings of the 93rd Annual Conference and Exhibition of the Air & Waste Management Association*. June 2000.
5. Schwerdtfeger, C. and Phillips, E. “An Emergency Response and Regulatory Compliance Tool for a Large Military Base in California.” *Proceedings of the Fourth Tri-Service Environmental Technology Symposium*. June 2001.



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- Schwerdtfeger, C. "How to Select Permit Conditions to Ensure Maximum Operational Flexibility: A Case Study at a Cardboard Manufacturing Facility." *Proceedings of the 96th Annual Conference and Exhibition of the Air & Waste Management Association*. May 2003.
- Schwerdtfeger, C., DeCosta, T., and Martinez, M. "A Recycling Exemption for Oil/Water Separator Waste at a Large Military Base in California." *Proceedings of the 96th Annual Conference and Exhibition of the Air & Waste Management Association*. May 2003.
- Schwerdtfeger, C. and Schroeder, J. "A Benchmark Study of Current Practices and Tools for Sustainability." *Environmental Management, a publication of the Air & Waste Management Association*. October 2008.
- Schwerdtfeger, C. and DeCosta, T. "The First Greenhouse Gas Assessment at Eight Bases Within Marine Corps Installations West". *2009 Federal Environmental Symposium*. June 2009.
- GHG Risks, Reporting and Stakeholders*. Southern California Joint Meeting of The Auditing Roundtable, The Institute of Internal Auditors & American Public Transportation Association. November 2009.
- Preparing for GHG Verification*. 2010 Winter Meeting & Technology Expo. The Auditing Roundtable. January 2010.
- An Inefficient and Costly Patchwork Quilt of GHG Reporting*. Energy, Utility & Environment Conference (EUEC). January 2011.
- Greenhouse Gas Reporting: Reality vs. Myth*. Partnership for Environmental Technology and Education (PETE) Conference. August 7, 2012.
- The Rapidly Changing World of GHGs*. Industrial Environmental Coalition of Orange County. November 15, 2012.

GUEST LECTURES/TRAINING SESSIONS

- Working as a Bench Chemist at Hughes Aircraft Company*. University of California Irvine, Industrial Chemistry Class. May 1998.
- Professional Opportunities for Chemists in an Environmental Consulting Firm*. University of Southern California, The Trojan Chemistry Club. October 1992.
- RCRA Generator Training for GEAE Employees*, General Electric Aircraft Engines. Palmdale, CA. July 1995.
- Environmental Concerns and Reasons for Technology Changes*. University of Southern California. Society of Women Engineers. 1996.
- Project Delivery Bootcamp*. CH2M HILL, presented annually 1999-2006.
- PM Training Session #1: Setup and Status of Projects*. EM-Assist. January 2007.
- Small Business Perspective: Recommendations to Improve Contracts and Contracting*. Marine Corps Installations West. Conservation Expo. March 2007.
- Sustainability/Green Careers - Panel Member*. University of California Irvine Extension. April 2009.
- Sustainability Reporting – Drivers, Protocols and Quantitative Methods (a 6-week online course)*. University of California Irvine Extension Program. Taught annually from 2009 - 2011.



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10. *GHG Compliance: Reality vs. Myth*. Los Angeles/Orange County Environmental Training Center. October 2009.
11. *Sustainability and Supply Chain Management*. University of California, Paul Merage School of Business. November 2009.
12. *Sustainability and the ESH Strategic Direction*. Confidential Fortune 100 Client. February 2010.
13. *Helping You Navigate GHG Compliance Issues at Various Regulatory Levels*. Los Angeles/Orange County Environmental Training Center. March 2010.
14. *Greenhouse Gases – Key Concepts and Tools for Decision-makers*. Claremont Graduate University. Peter F. Drucker & Masatoshi Ito Graduate School of Management. March 2010.
15. *Expert Host for Roundtable Discussion on Education*. Women in Green Forum. September 2010.
16. *2011 Career Fest. Speaker for “GREEN Spotlight”*. University of California Irvine. February 2011.
17. *Multi-media Environmental Compliance (a 6-week online course)*. University of California Irvine Extension Program. Taught during Fall 2011.
18. *GHG Reporting: Reality vs. Myth*. Los Angeles/Orange County Environmental Training Center. January, March and October 2012.
19. *Greening Your Business*. 2012 Southern California Gas Company Business Expo. March 2012.
20. *GHG Reporting: Reality vs. Myth*. Central California Environmental Training Center. November 2012.
21. *Environmental Awareness Training*, Evergreen Safety Council, February 2013.
22. *31 Years After Douglass...*, Douglass Project for Rutgers Women in Math, Science, and Engineering, Rutgers University, April 2014.
23. *Environmental Regulations: Realty vs. Myth*, Interfaith Eco-Network of Georgetown, May 2016.

AWARDS

- Project Manager of the Year (Southern California). Radian International. December 1996.
- Project Manager of the Year (Southern California). Radian International. January 1999.
- Award for Excellent Mentoring and Coaching of Junior Staff. CH2M HILL. February 2001.
- Business Achievement Award for Consulting & Engineering (C&E) Firms: New Practice Areas: Climate Change and Sustainability. Environmental Business Journal. January 2010.
- Business Achievement Award for Consulting & Engineering (C&E) Firms: Climate Change Practice. Climate Change Business Journal. January 2010.
- Business Achievement Award for Consulting & Engineering (C&E) Firms: New Practice Areas: Climate Change and Sustainability. Environmental Business Journal. January 2011.
- Finalist for Outreach and Education. International Green Industry Hall of Fame. March 2011.
- Lifetime Achievement Award for Outreach and Education. International Green Industry Hall of Fame. March 2012.
- 2016 Influential Business Woman Award: Sustainable Environment - GHG Consultancy Firm - California. Acquisitions International Magazine. June 2016.

AFFILIATIONS

Interfaith Eco-Network of Georgetown



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Registrar Accreditation Board by Quality Society of Australasia (RABQSA) [renamed "Exemplar Global"]

REGISTRATIONS AND ACCREDITATION DETAILS

Lead EMS Auditor for ISO 14001, RABQSA Certificate No.121210

GHG Lead Verifier, California Air Resources Board (ARB) Executive Order H-15-125

- Oil & Gas Systems Specialist
- Process Emissions Specialist
- Transactions Specialist

GHG Lead Offset Verifier, ARB, Executive Order (H2-12-139)

- Livestock Project Specialist
- Ozone Depleting Substance Project Specialist
- Urban Forest Project Specialist



COMPLETED TRAINING AND COURSEWORK

Environmental Courses				
Course Title	Course Provider	Completion Date	No. of Credits	Type of Credit
Corporate Value Chain (Scope 3) Accounting and Reporting Standard	GHG Management Institute	10/2016	20	CEU
Hazardous Waste Generator Improvement Rule	Environmental Resource Center	4/2016	1	CEU
EPA's New Exclusions for Solvent Recycling and Hazardous Secondary Materials	Environmental Resource Center	4/2016	1	CEU
Annex SL and ISO 14001:2015 e-learning Course	Lloyd's Register	1/2016	9	CPD
ISO 14001:2015 Transition Assessment	Exemplar Global	1/2016	7	CPD
Re-accreditation Training for GHG Verifiers	CARB	5/2015	NA	Exam
Hazardous Waste and Universal Waste Compliance Basic Training	Dufour Seminars & Training	11/2014	4	CEUs
Waste Management ⁱ	Coca-Cola	2/2013	1	PDU
Waste Water Operations ⁱⁱ	Coca-Cola	3/2013	2	PDU
Source Water Protection	Coca-Cola	2/2013	1	PDU
Accreditation Training for GHG Offset Verifiers	CARB	7/2012	NA	Exam
Re-accreditation Training for GHG Verifiers	CARB	4/2012	NA	Exam
LRQA New Assessor Induction Training	LRQA	2/2012	18	PDU
EMS Auditor/Lead Auditor Training Course	LRQA	1/2012	36	PDU
Greenhouse Gas Emissions – Climate Change Law and Initiatives	CLE	12/2009	12	MCLE
Greenhouse Gas Emissions Verifier Training Course	CARB	6/2009	NA	Exam
Overview of California Universal Waste Rules	DTSC	1/2008	2	PDU
Universal and Electronic Waste Management	DTSC	1/2008	4	PDU
Dangerous Goods Shipping	CH2M HILL	8/2002	1	PDU



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Waste Management	CH2M HILL	8/2002	2	PDU
Composters & Bio-filters	CH2M HILL	3/2001	1	PDU
EIR & EIS Environmental Planning	CH2M HILL	5/2000	8	PDU
Pollution Prevention	CH2M HILL	10/1999	1	PDU
Principles of Hazardous Materials Management	UCLA	3/1990	4	Units
Hazardous and Solid Waste Minimization	Government Institutes of Washington, DC	2/1990	12	CEUs
Hazardous Waste and Universal Waste Compliance Basic Training	Dufour Seminars & Training	11/2014	4	CEUs
Hazardous Waste Generator Improvement Rule	Environmental Resource Center	04/2016	1	CEU
EPA's New Exclusions for Solvent Recycling and Hazardous Secondary Materials	Environmental Resource Center	04/2016	1	CEU

Learning and Education Courses

Course Title	Course Provider	Completion Date	No. of Credits	Type of Credit
International Opportunities to Teach Online	UC Irvine	2/2009	1.5	Units
Developing Materials for an Asynchronous Online Course	UC Irvine	11//2008	3	Units
e-Learning	Skillsoft	10/2008	3	PDU
Learn to Have a Career Teaching Online	UC Irvine	10/2008	1.5	Units
Cross-Cultural Dimensions in Education	Concordia University	1/2002	3	Units

Business Courses (includes Financial, Contracts and Human Resources)

Course Title	Course Provider	Completion Date	No. of Credits	Type of Credit
Proposal Manager And Quantity Estimator Training	CH2M HILL	6/2006	2	PDU
Federal Compliance: Truth In Negotiations Act	CH2M HILL	3/2006	1	PDU



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Federal Compliance: Procurement Integrity Training	CH2M HILL	3/2006	1	PDU
Harassment Training For Supervisors	CH2M HILL	11/2005	2	PDU
Drug Free Workplace Program	CH2M HILL	9/2005	1	PDU
Tricks, Traps and Ploys in California Construction Disputes	Lorman Education Services	3/2005	0.65	CEU
Plan Reading and Scheduling	Lorman Education Services	1/2005	0.60	CEU
Project Management Forums - Risk Assessment	CH2M HILL	7/2004	1	PDU
Subcontractor Management	CH2M HILL	12/2002	1	PDU
Risk Management/Quality Control	CH2M HILL	1/2001	1	PDU
Project Delivery	CH2M HILL	11/2000	48	PDU
Lessons In Professional Liability	CH2M HILL	3/2000	4	PDU
Building And Negotiating A Better Deal	CH2M HILL	3/2000	16	PDU
Project Delivery	CH2M HILL	10/1999	24	PDU
Outsourcing	CH2M HILL	9/1999	1	PDU
Margin Metrics - NAC Budget, Conversion, Project Statusing, Reports, Revenue and Cost Budgeting, and Performance Measures	CH2M HILL	8/1999	8	PDU

Health & Safety Courses				
Course Title	Course Provider	Completion Date	No. of Credits	Type of Credit
2016 Cal/OSHA Compliance & Inspection Management Update	Dufour Seminars & Training	10/2016	3	CEU
Hazards in the Workplace - PPE, Working at Height, Confined Spaces and Energized Systems	LRQA	7/2015	1	PDU
Confined Space Entry	Coca-Cola	6/2013	1	PDU
Hazardous Energy Control (Lock-out Tagout)	Coca-Cola	7/2013	1	PDU
Machine Guarding	Coca-Cola	7/2013	1	PDU



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Hot Work	Coca-Cola	7/2013	1	PDU
Fall Protection	Coca-Cola	7/2013	1	PDU
First Aid	Coca-Cola	6/2013	1	PDU
Hearing Conservation	Coca-Cola	6/2013	1	PDU
Local Exhaust Ventilation	Coca-Cola	7/2013	1	PDU
Personal Protective Equipment	Coca-Cola	6/2013	1	PDU
Respiratory Protection	Coca-Cola	6/2013	1	PDU
Electrical Safety	Coca-Cola	7/2013	1	PDU
Fire Safety	Coca-Cola	7/2013	1	PDU
Lift Truck Safety	Coca-Cola	7/2013	1	PDU
Machine Guarding	Coca-Cola	7/2013	1	PDU
Material Handling Equipment	Coca-Cola	7/2013	1	PDU
Warehouse Safety	Coca-Cola	6/2013	1	PDU
Advanced Electrical Safety	Coca-Cola	7/2014	1	PDU
Hazard Identification Training	Coca-Cola	3/2013	1	PDU
Contractor Management	Coca-Cola	3/2013	1	PDU
Fleet Management	Coca-Cola	3/2013	1	PDU
Managing Hazardous Materials	Coca-Cola	3/2013	1	PDU
Fire Extinguishers	CH2M HILL	1/2005	1	PDU
Blood borne Pathogens	CH2M HILL	7/2004	1	PDU
8-Hour HAZWOPER Refresher Training	CH2M HILL	9/2003	8	PDU
Ladder Safety	CH2M HILL	12/2002	1	PDU
Excavation Safety Training	CH2M HILL	12/2002	2	PDU
First Aid and CPR	University Training Center Inc.	9/2002	8	PDU
Electrical Safety (General)	CH2M HILL	12/2002	1	PDU
Fall Protection	CH2M HILL	12/2002	1	PDU
10-Hour Construction Safety Awareness ⁱⁱⁱ	CH2M HILL	12/2002	10	PDU
Noise Protection	CH2M HILL	9/2002	1	PDU
Behavior Based Loss Prevention Systems	CH2M HILL	8/2002	1	PDU
Safety Awareness	CH2M HILL	5/1999	1	PDU



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Hazard Communication per 29 CFR 1910.120	CH2M HILL	5/1999	1	PDU
40-Hour Hazardous Waste Operations and Emergency Response (per 29 CFR 1910.120) ^{iv}	Compliance Solutions Inc.	4/1997	40	PDU
Fire Extinguisher - hands-on training	Hughes Aircraft Company	1990	NA	NA

Key:

PDU = professional development unit

CEU = continuing education unit

MCLE = mandatory continuing legal education

unit = credit from accredited university

DTSC = State of California, Department of Toxic Substances Control

CH2M HILL = #1 environmental engineering and consulting firm with a strong internal training and development program

CLE = Continuing Law Education International

CARB = California EPA, Air Resources Board

ⁱ Waste Management (KORE Std ES-RQ-220) addresses biomedical wastes and vaccination of employees who come into contact with biosolids.

ⁱⁱ Wastewater Management (KORE Std ES-RQ-225) addresses vaccination of workers against pathogenic diseases such as: hepatitis, cholera and typhoid fever

ⁱⁱⁱ Included many topics: general safety awareness, use of ladders and fall protection, electrical safety, confined spaces, LOTO, respiratory protection, PPE, etc.

^{iv} Includes many safety topics per OSHA guidelines under 29 CFR 1910.120 Appendix E:
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9770