Petra Pless, D. Env.

440 Nova Albion Way
San Rafael, CA 94903
(415) 492-2131 voice
(775) 254-5849 fax
ppless@earthlink.net

Dr. Pless has over 10 years of experience in environmental engineering and science conducting and managing interdisciplinary environmental research projects and preparing and reviewing environmental permits and other documents for U.S. and European stakeholder groups. This broad-based experience includes air quality and pollution control; water quality, water supply, and water pollution control; noise studies; CEQA review; industrial ecology and risk assessment; and use of a wide range of environmental software.

EDUCATION

Doctorate in Environmental Science and Engineering (D.Env.), University of California, Los Angeles, 2001

M.S. Biology (Botany/Ecology), Technical University of Munich, Germany, 1991

PROFESSIONAL HISTORY

Leson Environmental Consulting, Kensington, CA, Environmental Scientist, 1997–Present

University of California Los Angeles, Graduate Research Assistant/Teaching Assistant, 1994–96

ECON Research and Development, Environmental Scientist, Ingelheim, Germany, 1992–93

Biocontrol, Environmental Projects Manager, Ingelheim, Germany, 1991–92

REPRESENTATIVE EXPERIENCE

Air Quality and Pollution Control

Experience in all aspects of air quality and pollution control including attainment and non-attainment new source review ("NSR"), prevention of significant deterioration ("PSD") and Title V permitting; BACT, LAER, RACT, BARCT, and MACT analyses; technology evaluations and cost-effectiveness analyses; criteria and toxic pollutant emission inventories; emission offsets; ambient and source monitoring. Some typical projects include:

- Critically reviewed and prepared technical comments on the air quality (biology, noise, water quality, and public health) sections of CEQA documents for numerous commercial, residential, and industrial projects and quarries/mines in California.
- Critically reviewed and prepared technical comments on the air quality and public health sections of the Los Angeles Airport Master Plan (Draft, Supplement, and Final) under NEPA/CEQA for the City of El Segundo. Provided technical comments on the Draft General Conformity Determination for the preferred alternative submitted to the Federal Aviation Administration.

- In conjunction with the permitting of several residential and commercial developments, conducted studies to determine baseline concentrations of diesel exhaust particulate matter using an aethalometer.
- Critically reviewed and prepared technical comments on Draft Title V permits and for several refineries and other industrial facilities in California.
- For several California refineries, evaluated compliance of fired sources with Bay Area Air Quality Management District ("BAAQMD") Rule 9-10. This required evaluation and review of hundreds of source tests to determine if refinery-wide emission caps and compliance monitoring provisions were being met.
- For an Indiana steel mill, evaluated technology to control NOx and CO emissions from fired sources, including electric arc furnaces and reheat furnaces, to establish BACT. This required a comprehensive review of U.S. and European operating experience. The lowest emission levels were being achieved by steel mills using selective catalytic reduction ("SCR") and selective non-catalytic reduction ("SNCR") in Sweden and The Netherlands.
- For a California petroleum coke calciner, evaluated technology to control NOx, CO, VOCs, and PM10 emissions from the kiln and pyroscrubbers to establish BACT and LAER. This required a review of state and federal clearinghouses, working with regulatory agencies and pollution control vendors, and obtaining and reviewing permits and emissions data from other similar facilities. The best-controlled facilities were located in the South Coast Air Quality Management District ("SCAQMD").
- For a Kentucky coal-fired power plant, identified the lowest NOx levels that had been permitted and demonstrated in practice to establish BACT. Reviewed operating experience of European, Japanese, and U.S. facilities and evaluated continuous emission monitoring data. The lowest NOx levels had been permitted and achieved in Denmark and in the U.S. in Texas and New York.
- In support of efforts to lower the CO BACT level for power plant emissions, evaluated the contribution of CO emissions to tropospheric ozone formation and coauthored report on same.
- Critically reviewed and prepared technical comments on applications for certification ("AFCs") for several natural-gas fired and geothermal power plants in California permitted by the California Energy Commission ("CEC"). The comments addressed construction and operational emissions inventories and dispersion modeling, BACT for turbines, etc.
- Critically reviewed and prepared technical comments on draft PSD permits for several natural-gas fired power plants in California, Indiana, and Oregon. The comments addressed emission inventories, BACT, case-by-case MACT, compliance monitoring, cost-effectiveness analyses, and enforceability of permit limits.
- For a California refinery, evaluated technology to control NOx and CO emissions from CO Boilers to establish RACT/BARCT to comply with BAAQMD Rule 9-10. This required a review of BACT/RACT/LAER clearinghouses, working with regulatory agencies across the U.S., and reviewing federal and state regulations and State

Implementation Plans ("SIPs"). The lowest levels were required in a SCAQMD rule and in the Texas SIP.

- In support of several federal lawsuits filed under the Clean Air Act, prepared cost-effectiveness analyses for SCR and oxidation catalysts for simple cycle gas turbines and evaluated opacity data.
- Provided comprehensive environmental and regulatory services for an industrial laundry chain. Facilitated permit process with the SCAQMD. Developed test protocol for VOC emissions, conducted field tests, and used mass balance methods to estimate emissions. Reduced disposal costs for solvent-containing waste streams by identifying alternative disposal options. Performed health risk screening for air toxics emissions. Provided permitting support with SCAQMD. Renegotiated sewer surcharges with wastewater treatment plant. Identified new customers for shop-towel recycling services.
- Designed computer model to predict performance of biological air pollution control (biofilters) as part of a collaborative technology assessment project, co-funded by several major chemical manufacturers.
- Experience using a wide range of environmental software, including air dispersion models, air emission modeling software, database programs, and geographic information systems ("GIS").

Water Quality and Pollution Control

Experience in all phases of water quality and pollution control, including surface water and ground water quality and supply studies, evaluating water and wastewater treatment technologies, and identifying, evaluating and implementing pollution controls. Some typical projects include:

- Evaluated impacts of on-shore oil drilling activities on large-scale coastal erosion in Nigeria. This work is ongoing.
- For a homeowner's association, reviewed a California Coastal Commission staff report on the replacement of 12,000 linear feet of wooden bulkhead with PVC sheet pile armor. Researched and evaluated impact of proposed project on lagoon water quality, including sediment resuspension, leaching of additives and sealants, and long-term stability. Summarized results in letter report.
- For a 500-MW combined-cycle power plant, prepared a study to evaluate the impact of proposed groundwater pumping on local water quality and supply, including a nearby stream, springs, and a spring-fed waterfall. The study was docketed with the CEC and summarized in a journal article.
- For a 500-MW combined-cycle power plant, identified and evaluated methods to reduce water use and water quality impacts. These included the use of zero-liquid-discharge systems and alternative cooling technologies, including dry and parallel wet-dry cooling. Prepared cost analyses and evaluated impact of options on water resources. This work led to a settlement in which parallel wet dry cooling and a crystallizer were selected, replacing 100% groundwater pumping and wastewater disposal to evaporation ponds.

Applied Ecology, Industrial Ecology and Risk Assessment

Experience in applied ecology, industrial ecology and risk assessment, including human and ecological risk assessments, life cycle assessment, evaluation and licensing of new chemicals, and fate and transport studies of contaminants. Experienced in botanical, phytoplankton, and intertidal species systematics and water chemistry analyses. Some typical projects include:

- Critically reviewed and prepared technical comments on AFCs for several natural-gas fired and geothermal power plants and transmission lines in California permitted by the CEC. The comments addressed avian collisions and electrocution, construction and operational noise impacts on wildlife, risks from brine ponds, and impacts on endangered species.
- Evaluated likelihood that measured organochlorine pesticide concentrations at a U.S. naval air station are residuals from past applications of these pesticides consistent with manufacturers' recommendations.
- For a 180-MW geothermal power plant, evaluated the impacts of plant construction and operation on the fragile desert ecosystem in the Salton Sea area. This work included baseline noise monitoring and assessing the impact of noise, brine handling and disposal, and air emissions on local biota, public health, and welfare.
- Evaluated the public health impacts of locating big-box retail developments in densely populated areas in California and Hawaii. The impacts of diesel exhaust emissions and noise on surrounding residential communities were measured and evaluated. This work is continuing.
- Designed and managed toxicological study on potential interference of delta-9-tetra-hydrocannabinol in food products with U.S. employee drug testing. Coauthored peer-reviewed publication.
- Conducted technical, ecological, and economic assessments of product lines from agricultural fiber crops for European equipment manufacturer. Coauthored proprietary client reports.
- Prepared human health risk assessments of air emissions from several industrial and commercial establishments, including power plants, refineries, and commercial laundries.
- Managed and conducted studies to license new pesticides. This work included the evaluation of the adequacy and identification of deficiencies in existing physicochemical and health effects data sets, initiating and supervising studies to fill the data gaps, conducting fate and transport studies, and QA/QC compliance at subcontractor laboratories. Prepared licensing applications and coordinated their progress with German registration agencies. This work led to regulatory approval of several pesticide applications in less than 6 months.
- Designed and implemented database on physico-chemical properties, environmental fate, and health impacts of pesticides for a major European pesticide manufacturer.
- Developed life cycle assessment methodology for industrial products, including agricultural fiber crops and mineral fibers. Analyzed technical feasibility and markets

for thermal insulation materials from plant fibers and conducted comparative life cycle assessments.

- Designed research protocols for a coastal ecological inventory. Developed sampling methodologies, coordinated field sampling, identified species in intertidal zone, and analyzed data.
- Designed and conducted limnological study on effects of physico-chemical parameters on phytoplankton succession; performed water chemistry analyses and identified phytoplankton species. Co-authored two journal articles on results.
- Conducted and organized underwater surveying and mapping of macrophytes in many lakes and rivers in Sweden and Germany as ecological indicators for the health of limnological ecosystems.
- Provided pro-bono consulting for the Pine Ridge Reservation in South Dakota. Assessed environmental improvement and economic development projects and recommended methods to improve the quality of life.

PROFESSIONAL AFFILIATIONS

American Chemical Society
American Institute of Chemical Engineers
Association of Environmental Professionals

SELECTED PUBLICATIONS

Fox, J.P., Rose, T.P., Sawyer, T.L., Pless, P. Isotope hydrology of a spring-fed waterfall in fractured volcanic rock. To be submitted to Journal of Hydrology.

Fox, J.P. and Pless, P. Fuel and energy penalties associated with catalytic pollution control systems used in power generation. To be submitted to Power Engineering.

Fox, J.P. and Pless, P. Cost-effectiveness of catalytic oxidation for the control of VOCs and CO from power generation facilities. To be submitted to Journal of the Air & Waste Management Association.

Leson, G., Pless, P., Grotenhermen, F., Kalant, H., ElSohly, M. Evaluating the impact of hemp food consumption on workplace drug tests. Journal of Analytical Toxicology, 25: 11/12, 1-8, 2001.

Pless, P. Technical and environmental assessment of thermal insulation materials from fiber crops. Doctoral Dissertation in Environmental Science and Engineering, University of California, Los Angeles, 2001.

Leson, G., Pless, P. Assessing the impact of THC uptake from hemp oil cosmetics on workplace drug testing. Report to the Agricultural Research and Development Initiative ("ARDI"), Morris, MB, 2001.

Leson, G., Pless, P. Hemp seeds and hemp oil. Grotenhermen, F., Russo, E. (eds.): Cannabis und cannabinoids. Pharmacology, toxicology, and therapeutic potential. The Haworth Integrative Healing Press, New York, 2002.

Leson, G., Pless, P. Hemp foods and oils for health. Your guide to cooking nutrition and body care. HempTech, Sebastopol, CA, 1999.

Leson, G., Pless, P. What variety? Hemp cultivars for Canada. Commercial Hemp, 7-8, Fall 1998.

Leson, G., Pless, P. Farming and processing: Technology status. Commercial Hemp, 5-6, Summer 1998.

Center of Waste Reduction Technologies. Collaborative Biofilter Project. Technical report. Co-author with G. Leson of sections Compound Database, Design Manual, and Literature Database. Center of Waste Reduction Technologies in the American Institute of Chemical Engineers.

Hantke, B., Domany, I., Fleischer, P., Koch, M., Pless, P., Wiendl, M., Melzer, M. Depth profiles of the kinetics of phosphatase activity in hardwater lakes of different trophic level. Arch. Hydrobiologia, 135: 451–471, 1996.

Hantke, B., Fleischer, P., Domany, I., Koch, M., Pless, P., Wiendl, M., Melzer, M.: P-release from DOP by phosphatase activity in comparison to P-excretion by zooplankton: Studies in hardwater lakes of different trophic level. Hydrobiologia, 317: 151–162, 1996.

Pless, P. Untersuchungen zur Phytoplanktonentwicklung im Herrensee (Investigations on phytoplankton succession in an oligotrophic hardwater lake). Masters Thesis in Biology/ Ecology, Technical University of Munich, Germany, 1991.