

DAVID J. SHOTTS, P.E.

EDUCATION

B.S., Mechanical Engineering, Virginia Polytechnic Institute and State University, 1984

PROFESSIONAL REGISTRATIONS

Professional Engineer, State of New York, 1991

TECHNICAL SPECIALTIES

Mr. Shotts has 20 years of experience encompassing:

- New Source Review (PSD and Non-Attainment) Air Permitting
- Title V Operating Permit and Inventory Assistance
- Air Pollution Engineering and BACT/LAER Analysis
- Fugitive Dust Analysis
- Regulatory Compliance Analysis
- Environmental Liability Due Diligence Review
- Monitoring Analysis

REPRESENTATIVE EXPERIENCE

Overview

Mr. Shotts is the Manager of Air Quality Engineering in TRC's Mid-Atlantic Office located in Lyndhurst, New Jersey. He is a registered Professional Engineer in the State of New York with 20 years of experience in the fields of air pollution control, engineering, permitting and regulatory analysis. His experience ranges from the preparation of environmental impact analyses, air permit applications and facility audits for Virginia Power to air quality project management and BACT/LAER analyses. Mr. Shotts has extensive experience in air emissions permitting and engineering and specializes in studies for the power, refining, chemical, pharmaceutical and manufacturing industries.

Air Emissions Permitting

Mr. Shotts has managed or been involved with a wide variety of air quality permitting projects throughout the northeastern and southeastern United States. He has prepared operating permits and Prevention of Significant Deterioration (PSD) permits for utilities, cogeneration facilities, government projects, and pharmaceutical companies. Mr. Shotts has participated in many aspects of air permitting including the quantification and calculation of emissions, control technology analysis and the development of emissions inventories.

Air Permit Application, Entergy Power Group, Indian Point Peaking Facility, Village of Buchanan, Westchester County, NY. Air permitting for a 360 MW power plant at the Indian Point 3 nuclear generating station property in the Village of Buchanan, New York, consisting of two General Electric 7FA natural gas fired turbines in simple cycle mode. The application was based on gas-fired dry low-NO_x technology design with a high temperature SCR to control NO_x emissions and an oxidation catalyst to control emissions of CO and VOCs. Modeling performed as required by the New York State Department of Conservation (NYSDEC) regulations and New York State Article X permitting requirements. The facility had potential emission rates less than the PSD emission thresholds; therefore, the application included a LAER determination for NO_x, including review of the proposed high-temperature SCR, and modeling of criteria pollutant emissions to determine compliance with the NYSDEC standards.

PSD / Non-Attainment Air Permit Application, Con Edison Development Ocean Peaking Power, Lakewood, NJ. Air permitting for a 500 MW power plant to be located at the site of an existing cogeneration facility in Lakewood, New Jersey, consisting of three General Electric 7FA combustion turbines in simple cycle mode. The application is based on gas-fired dry low-NO_x technology design with three co-located stacks and no add-on control technology. The application includes a LAER determination for NO_x, including review of high-temperature SCR, a BACT analysis for CO and other PSD pollutants, and justification for a simple cycle project to operate at a 12% capacity factor.

PSD / Non-Attainment Air Permit Application, AES Red Oak. Air permitting for a 700 MW power plant to be located at a new site in Sayreville, New Jersey, consisting of three Siemens-Westinghouse 501F combustion turbines in combined cycle mode. The application was initially based upon a worst-case envelope of emissions and exhaust characteristics from four different turbine models from different vendors, then revised based upon a gas-only 501F design, including selective catalytic reduction and oxidation catalyst control technology. The application includes LAER determinations for NO_x and VOC, with emissions levels negotiated with NJDEP.

Air Permit Application, PG&E National Energy Group Salem Harbor Emissions Control Project, Salem Harbor, Massachusetts. Prepared Emission Control Plan and Air Plan Approval application for a retrofit air pollution control project consisting of addition of controls for existing coal and oil-fired boilers at PG&E NEG's Salem Harbor Generating Station. An innovative approach will be employed to treat the combined flue gas streams from three coal-fired boilers with a single SCR NO_x control system and dry lime FGD SO₂ control vessel and fabric filter. Significant reductions in SO₂ and NO_x required to meet Massachusetts 310 CMR 7.29 requirements ensure that the project nets out of PSD and non-attainment new source review, but minor increases potential emissions of other byproduct pollutants are great enough to trigger Massachusetts 310 CMR 7.02 Plan Approval requirements, including BACT. The strategic development phase of the project involved analysis of alternative control technology schemes, including projection of future compliance with the Massachusetts output-based emission standards for NO_x and SO₂, and assessment of differences in performance on trace metal hazardous air pollutants. The Plan Approval application included emissions estimates and BACT analyses for carbon monoxide, volatile organic compounds, formaldehyde (due to urea used in the SCR) and ammonia slip. Provided testimony at public hearings and participated in negotiations with MADEP. Prepared direct and rebuttal testimony and

served as a witness for examination in support of client's appeal of an unfavorable decision on its Emission Control Plan and associated applicability triggers and deadlines. Supported negotiations with agencies and other stakeholders, including analysis of creation of emission reduction credits and their associated costs and values, which resulted in settlement of the appeal and elimination of permitting requirements.

Air Permit Application, PG&E National Energy Group Salem Harbor Emissions Control Project, Brayton Point, Massachusetts. Prepared Emission Control Plan and Air Plan Approval application for a retrofit air pollution control project consisting of addition of SCR NO_x controls and wet limestone FGD SO₂ controls for existing coal-fired boilers at PG&E NEG's Brayton Point Generating Station. Significant reductions in SO₂ and NO_x required to meet Massachusetts 310 CMR 7.29 requirements ensure that the project nets out of PSD and non-attainment new source review, but minor increases potential emissions of other byproduct pollutants are great enough to trigger Massachusetts 310 CMR 7.02 Plan Approval requirements, including BACT. The Plan Approval application included emissions estimates and BACT analyses for formaldehyde (due to urea used in the SCR) and ammonia slip. Participated in negotiations with MADEP.

Air Permitting, Reliant Energy Seward Refuse Coal CFB, Seward, Pennsylvania. Providing PSD/Non-Attainment air permitting for two 250 MW circulating fluidized bed boilers that will burn refuse coal and raw coal in southwest Pennsylvania. Existing coal-fired units at the site will be retired, resulting in net emission reductions for sulfur dioxide and nitrogen oxides. The project will involve analysis of fugitive dust emissions associated with coal, limestone and ash handling and storage.

Article X and Air Permitting, Mirant Bowline Unit 3, West Haverstraw, New York. Provided PSD/Non-Attainment air permitting for a 750 MW combined cycle power generation facility in West Haverstraw, New York. The project consists of three natural gas and oil fired GE 7FA combustion turbines in combined cycle mode, with duct burners for supplementary firing of the HRSG. The project is located in a severe ozone non-attainment region and is subject to non-attainment review. Services included negotiations with Article X participants and support for settlement conferences and public hearing.

Article X and Air Permitting, NYPA Poletti Combined Cycle Project, Queens, New York. Provided PSD/Non-Attainment air permitting for a 500 MW combined cycle power generation facility in New York City. The project consists of two natural gas and oil fired GE 7FA combustion turbines in combined cycle mode. The project is located in a severe ozone non-attainment region and the area is currently designated as moderate non-attainment for CO as well.

Article X and Air Permitting, KeySpan Ravenswood Combined Cycle Project, Queens, New York. Provided PSD/Non-Attainment air permitting for a 250 MW combined cycle power generation facility in New York City. The project consists of a natural gas and oil fired GE 7FA combustion turbine in combined cycle mode, with duct burner for supplementary firing of the HRSG. The project is located in a severe ozone non-attainment region and the area is currently designated as moderate non-attainment for CO as well.

Air Permitting, FPL Energy Marcus Hook Cogeneration Facility, Pennsylvania. Provided PSD/Non-Attainment air permitting for a 750 MW combined cycle cogeneration facility to be located at the Sunoco refinery in Marcus Hook, Pennsylvania. The project consists of three natural gas fired GE 7FA combustion turbines in combined cycle mode, equipped with duct burner that may burn natural gas or refinery gas. Four auxiliary boilers may also burn natural gas or refinery gas. The project is located in a severe ozone non-attainment region and the area is currently designated as moderate non-attainment for CO as well. A netting analysis involved reductions associated with shutdown of existing boilers at the refinery. Services also included participation in meetings and negotiations with PaDEP and US EPA.

Air Permitting, Reliant Energy Hunterstown Combined Cycle Project, Hunterstown, Pennsylvania. Provided PSD/Non-Attainment air permitting for a 1600 MW combined cycle power generation facility in central Pennsylvania. The project initially consisted of four natural gas fired Mitsubishi Heavy Industries 501G combustion turbines in combined cycle mode, with duct burners for supplementary firing of the HRSG, but was revised to a 900 MW project consisting of the first three GE 7FB combustion turbine units. An application was prepared for each version of the project, which is located in the ozone transport region and is subject to non-attainment review. The permit will allow an initial period of simple cycle testing for the 7FB prototype unit. Services included participation in negotiations and meetings with PaDEP and US EPA, and public hearing support.

PSD / Non-Attainment Air Permit Application, Columbia Energy Liberty Electric Combined Cycle Plant, Eddystone, Pennsylvania. Air permitting for a 500 MW power plant to be located at a brown field site in Eddystone, Pennsylvania, consisting of two General Electric 7FA combustion turbines in combined cycle mode. The application is based on gas-fired dry low-NO_x technology design with gas-fired duct burners with selective catalytic reduction NO_x control technology. The application BACT/LAER analysis and subsequent negotiations with PaDEP and USEPA in early 2000 resulted in a finding that an oxidation catalyst would not be required as BACT for CO or LAER for VOC.

PSD / Non-Attainment Plan Approval (Air Permit) Application, AES Ironwood, Lebanon, Pennsylvania. Air permitting for a 700 MW combined cycle power plant to be located at a green field site in Lebanon, Pennsylvania, based upon two Westinghouse 501G turbines. Development of the application required development of annual emissions caps to take into account higher combustion turbine emissions during part-load operation and start-ups, LAER determinations for NO_x and VOC and a BACT cost analysis for CO.

Synthetic Minor Air Permitting, KeySpan Glenwood Landing, Nassau County, New York. Provided air permitting assistance for KeySpan Energy's Glenwood Landing simple cycle power project consisting of two GE LM600 combustion turbines. Directed development of synthetic minor permitting strategy to maximize operating flexibility while maintaining CO and NO_x emissions below applicable non-attainment major source thresholds, as well as negotiation of appropriate permit conditions with NYSDEC.

Synthetic Minor Air Permitting, KeySpan Port Jefferson, Suffolk County, New York. Provided air permitting assistance for KeySpan Energy's Port Jefferson simple cycle power project consisting of two GE LM600 combustion turbines located at the existing Port Jefferson Power Plant. Directed development of synthetic minor permitting strategy to maximize operating flexibility while maintaining criteria pollutant emissions (primarily NO_x, CO and PM-10) below applicable PSD major modification thresholds, as well as negotiation of appropriate permit conditions with NYSDEC.

Air Permitting, Reliant Energy Erie West Combined Cycle Project, Erie West, Pennsylvania. Provided PSD/Non-Attainment air permitting for a 900 MW combined cycle power generation facility in northwest Pennsylvania. The project was to consist of three natural gas fired GE 7FB combustion turbines in combined cycle mode, with duct burners for supplementary firing of the HRSG. The project was to be located in the ozone transport region subject to non-attainment review.

Air Permitting, MEGA Pierce Power, Fredrickson, Washington. Air permitting for a temporary simple cycle power plant to consist of seven GE TM2500 aeroderivative combustion turbines, equipped with SCR and oxidation catalysts, to be located in Fredrickson, Washington. The project is being permitted as a synthetic minor source, incorporating annual emission caps. CEM, stack testing and fuel usage monitoring will be employed, with emissions to be calculated on a monthly basis in order to demonstrate compliance with the caps.

Air Permitting, Trigen Energy Washington Convention Center, Washington, D.C. Provided air permitting assistance for installation of two gas/oil boilers and five diesel engines to provide heat and electricity to the new Washington, D.C. Convention Center. Prepared emissions estimates and developed synthetic minor strategy to avoid PSD and non-attainment new source review. Prepared application for submittal to Washington DOH and assisted in meetings and permit negotiations.

Air Permitting, Trigen-Cinergy Sweetheart Cup Owings Mills Cogeneration Project, Maryland. Air permitting for a internal combustion engine cogeneration plant to be located in Owings Mills Maryland at Sweetheart Cup's existing manufacturing facility. Assistance included development of operating restrictions order to avoid PSD and non-attainment new source review and participation in agency meetings including the public hearing.

Air Permitting, Trigen-Cinergy University of Maryland Cogeneration Project, College Park, Maryland. Air permitting for a combined cycle cogeneration plant to be located in College Park, Maryland at the University of Maryland's exiting steam plant. Assistance included a netting analysis involving shutdown of existing boilers in order to avoid PSD review and participation in agency meetings including the public hearing.

Air Permitting, Trigen-Cinergy Millennium Inorganic Chemicals Hawkins Point Cogeneration Project, Hawkins Point, Maryland. Air permitting for a combined cycle cogeneration plant to be located in Ashtabula, Ohio at Millennium Inorganic Chemicals' existing plant. Assistance included development of minor source strategy, including a netting analysis involving shutdown of existing boilers in order to avoid PSD review.

Air Permitting, Trigen-Cinergy Millennium Inorganic Chemicals Ashtabula Cogeneration Project, Ashtabula, Ohio. Air permitting for a combined cycle cogeneration plant to be located in Baltimore Maryland at Millennium Inorganic Chemicals' existing plant. Assistance included a netting analysis in order to avoid PSD review and participation in agency meetings including the public hearing.

Air Permitting, Delaware Clean Energy Project, Delaware City, Delaware. Air permitting for a project that would utilize Texaco gasification technology to convert 2350 tons per day of petroleum coke to syngas to be burned in a new 190 MW GE Frame 7F combustion turbine combined cycle unit and two existing boilers. Emission reductions from conversion of existing boilers at the Delaware City site from coke firing were being used to net out of Federal new source review requirements in order to expedite permitting. Requirements for "opt-in" to acid rain SO₂ allowance trading program are being investigated. The client is a partnership of Texaco Syngas, Star Enterprise, and Mission Energy. The project would provide steam and electricity to the existing Star Enterprise refinery and electricity to Delmarva Power & Light.

Air Permitting, Freehold Cogeneration Associates Facility, Constellation Energy, Freehold, New Jersey. Provided air permitting for the Freehold Cogeneration Associates facility, a 125 MW combined cycle cogeneration facility in central New Jersey. Submitted a complete application under the deadline to avoid non-attainment review requirements, and provided support at agency meetings and public hearings.

PSD Permit Application, Florida Power & Light Martin CGCC Plant, Martin County, Florida. Prepared a PSD permit application for a 1600 MW utility coal gasification and combined cycle facility to be located in Martin County, Florida.

PSD Permit Application, Energy Initiatives, Inc., Virginia. Prepared a PSD air permit application for the Bermuda Hundred Energy L.P. cogeneration project, a 292 MW combined cycle facility to be located in central Virginia. The project consists of two GE Frame 7EA combustion turbines with quiet combustors, duct burners for supplementary firing, and two package boilers burning natural gas and low-sulfur distillate oil. The application includes a top-down Best Available Control Technology (BACT) analysis for the turbines, burners, and boilers, prepared in accordance with Virginia DAPC and USEPA Region III guidance.

Air Permitting, Consolidated Power Company, Dunkirk, New York. Provided air permitting for the Dunkirk Cogeneration Company project, a 48 MW steam-injected gas turbine cogeneration unit. The unit would be equipped with selective catalytic reduction, and would be located in western New York State.

Air Permitting, Department of Energy, Savannah River, South Carolina. Provided air permitting support for the proposed heavy water reactor facility for Department of Energy's New Production Reactor at the Savannah River site in South Carolina. Developed licensing strategies and emissions estimates for combustion units (emergency diesel generators, etc.) and participated in meetings with the client and South Carolina Department of Health and Environmental Control.

Air Permitting, Sandoz Pharmaceuticals Corporation, East Hanover, New Jersey. Coordinated preparation of an air permit application for a trash-fired boiler located in northern New Jersey. The project involved the addition of acid gas and particulate matter control equipment to an existing 780 lb/hr incinerator with a heat recovery boiler. The application included a state-of-the-art review for pollution control, air quality modeling, and a health risk assessment.

Air Permitting, Confidential Pharmaceutical Client, New Jersey. Prepared an air permit application for a medical waste incinerator in Lafayette, New Jersey research facility. Prepared emission estimates based upon a combination of NJDEPE guidelines, published data, and stack test results for a similar facility.

PSD Permit Application, New Fossil Power Station Site Study, Virginia and North Carolina. Assembled complete PSD permit applications for three potential sites for a 3400 MW coal-fired power station. Interpreted regulations and met with state and federal agencies to determine required analyses. Directed preparation of documents, including pollution control technology reviews. Calculated all air emissions including those from stacks, cooling towers, and fugitive dust due to coal, FGD reagent, and waste handling.

Air Quality Licensing, Chesterfield Power Station Units 7 and 8, Virginia. Coordinated air quality licensing for Chesterfield Units 7 and 8, a 420 MW combined cycle addition utilizing the first General Electric model 7F advanced gas turbine. Led preparation of a PSD/non-attainment air permit application and environmental analyses supporting testimony for the State Corporation Commission and a petition for a Fuel Use Act exemption from the U.S. Department of Energy. Participated in contract negotiations with the vendor, and negotiations on pollution control requirements and permit limits with the Virginia Department of Air Pollution Control and the USEPA. Contributed to successful arguments against catalytic controls in response to the USEPA top-down policy for determining BACT.

Site Evaluation and Permitting Strategy, Gravel Neck and Darbytown Combustion Turbine Stations, Virginia. Devised and implemented a site evaluation methodology and permitting strategy for two 340 MW gas turbine peaking facilities. Prepared the air permit applications and noise analyses, and served as the company representative on air quality and noise at state and local public hearings and meetings.

Title V Operating Permit and Inventory Assistance

Mr. Shotts has managed or been involved in Title V program evaluation and permitting projects for a variety of clients throughout the United States. He has prepared emission inventories, compliance reviews and operating permit applications for utilities, cogeneration facilities, and chemical, automobile and food and beverage manufacturers. Mr. Shotts has participated in many aspects of air permitting including the quantification and calculation of emissions, control technology analysis and the development of emissions inventories.

Operating Permit Assistance, Vineland Municipal Electric Utility. Developed emission estimates for all VMEU operations for inclusion in New Jersey operating permit applications. Estimates were developed for coal/oil boilers, combustion turbine, diesel generator, coal and ash handling, cooling towers, storage tanks, etc. Combustion HAP's emissions factors were chosen based upon an extensive review of published factors and fuel analyses, as well as site-specific stack testing and fuel analysis.

Operating Permit Emissions Inventory, Centerior Energy, Ohio. Provided emission inventory development assistance for four coal-fired generating stations, including planning the inventory approach, leading the on-site data development effort, developing the emission calculation approach and supervising the performance of all emission calculations.

Operating Permit Assistance, Public Service Electric and Gas (PSE&G), New Jersey. Assisted in obtaining operating permits for 13 generating stations as required for compliance with the Clean Air Act Amendments. Developed plant-specific and system-wide schedules and manpower requirements, prepared comments on NJDEPE's proposed Subchapter 22 rules, and estimated and modeled fugitive dust emissions. Provided assistance in NO_x Reasonably Achievable Control Technology (RACT) compliance planning.

Operating Permit Preparation, General Motors Manufacturing Facilities. Project manager of overall Title V effort for eight GM manufacturing facilities and two proving grounds. The manufacturing facilities include engine plants and metal fabrication plants, and the proving grounds involve drive testing and testing related to safety, noise and emissions. Tasks include detailed emissions inventory, compliance review, record keeping plan and permit applications. Facilities are located in New York, Michigan, Ohio, Indiana, Pennsylvania and Arizona.

Operating Permit Assistance, Union Carbide Bound Brook and Weston Canal Facilities. Provided assistance in Title V permitting for Union Carbide research and development and production operations at its Bound Brook, NJ facility, including guidance with respect to application filing strategy, inventory preparation and identification of applicable requirements. Also completed an applicability checklist for the Weston Canal, NJ research and development facility to confirm and document its synthetic minor source status. Prepared permit application revisions to obtain new permits for existing boilers at the Weston Canal facility.

Operating Permit Assistance, Planters LifeSavers Brooklyn Plant. Conducted emissions inventory and developed synthetic minor source strategy for hard candy manufacturing plant in New York City. Emission estimates included boilers, storage tanks, fugitives and process VOC emissions associated with flavorings.

Emissions Inventory and Synthetic Minor Permitting Strategy Development, Salomon Brothers, Inc. 7 World Trade Center Emergency Generators, New York, New York. Conducted a site visit and emissions inventory for the Salomon Brothers 7 World Trade Center facility, including nine emergency diesel generators. Collected data and calculated actual and potential emissions and developed a synthetic minor strategy to avoid triggering Title V operating permit requirements

Emissions Inventory and Synthetic Minor Permitting, Salomon Smith Barney Brooklyn Army Terminal Printing Facility, New York. Conducted a site visit and emissions inventory for Smith Barney's Brooklyn Army Terminal printing facility in New York City and calculated actual and potential emissions for a variety of printing presses and related operations. Prepared air permit applications for non-exempt activities needing permits, and developed and implemented a synthetic minor strategy to avoid Title V for the larger printing operation resulting from the merger of Salomon Brothers and Smith Barney and the consolidation of their printing operations. Providing compliance-related assistance on an ongoing basis, including evaluation of permit requirements for new processes and annual emission statements.

Emissions Inventory and Minor Source Permit Assistance, Barnard College, New York, New York. Conducted emissions inventory and developed synthetic minor source strategy for college campus heating and utility system in New York City. Emission estimates included boilers and other combustion sources associated with campus utilities.

Operating Permit Preparation, Procter and Gamble, Sundor Brands, New Jersey. Responsible for overall Title V permitting effort including onsite data gathering, emission calculations, identification of applicable federal and state requirements and preparation of permit application package.

Air Pollution Engineering and RACT/BACT/LAER Analysis

Mr. Shotts has performed numerous control technology reviews, including Reasonable Available Control Technology, Best Available Control Technology and Lowest Achievable Emission Rate (RACT/BACT/LAER) analyses for major utilities and private industry. These analyses included extensive clearinghouse searches, cost studies, equipment appraisals and professional testimonies.

BACT/LAER Analysis, Mirant Canal Station Combined Cycle, Massachusetts. Provided air permitting assistance for the Mirant Canal Station Repowering Project, a combined cycle facility to be located at Mirant's existing Canal Generating Station. The facility consists of two natural gas and oil-fired GE 7FA turbines with duct burners in combined cycle mode equipped with selective catalytic reduction for NO_x control and an oxidation catalyst for CO control. The BACT/LAER analysis includes a cost analysis comparing SCR / oxidation catalyst combination to SCONOX by evaluating cost-effectiveness for increasingly stringent combinations of NO_x and ammonia slip limitations.

BACT/LAER Analysis, CPV Terrapin Project, Savannah, Georgia. Provided air permitting for the Competitive Power Ventures Terrapin Project, an 831 MW combined cycle facility to be located near Savannah, Georgia. The facility would consist of three natural gas and oil-fired GE 7FA turbines in combined cycle mode equipped with selective catalytic reduction for NO_x control. The BACT/LAER analysis includes a RACT/BACT/LAER Clearinghouse search and a cost-effectiveness analysis for control of carbon monoxide by an oxidation catalyst.

BACT Analysis, CPV Gulf Coast Project, Florida. Provided air permitting for the Competitive Power Ventures Gulf Coast Project, a 250 MW combined cycle facility to be located in Manatee County, Florida. The facility would consist of one natural gas and oil-fired GE 7FA turbine with an

unfired HRSG in combined cycle mode equipped with selective catalytic reduction for NO_x control. The BACT/LAER analysis includes a RACT/BACT/LAER Clearinghouse search and a cost-effectiveness analysis for control of carbon monoxide by an oxidation catalyst.

BACT/LAER Analysis, CPV Cunningham Creek, Palmyra, Virginia. Provided air permitting for the Competitive Power Ventures Cunningham Creek Project, a 500 MW combined cycle facility to be located in Fluvannah County, Virginia. The facility would consist of two natural gas and oil-fired GE 7FA turbines in combined cycle mode with duct burners and equipped with selective catalytic reduction for NO_x control. The BACT/LAER analysis includes a RACT/BACT/LAER Clearinghouse search and a cost-effectiveness analysis for control of carbon monoxide by an oxidation catalyst. Subsequently the project design was revised to incorporate an oxidation catalyst.

BACT/State-of-the-Art Analyses, Hydra-Co/CNG Energy, Lakewood, New Jersey. Provided air permitting for the Lakewood Cogeneration Project, a 210 MW combined cycle facility to be located in central New Jersey. The project involved control technology proposals for both aeroderivative and frame-type combustion turbines subject to dispatchable operation. Selective catalytic reduction will be used to control emissions of nitrogen oxides.

BACT/LAER Analyses, Destec Energy, Harriman, New York. Prepared air permit applications for the Destec Northway Cogeneration Project, a 57 MW combined cycle unit. The final application included BACT and LAER control technology reviews and a verification package for a multi-source modeling inventory.

BACT Support, Dayton Power & Light, Dayton, Ohio. Provided technical support for a BACT proposal for the Tait Peaking facility, consisting of seven 83 MW simple cycle combustion turbines. Conducted a comprehensive BACT/LAER clearinghouse search, summarized cost impacts, prepared expert testimony and participated in internal and agency meetings.

RACT Analyses, Hoffmann-LaRoche, Inc., Nutley and Belvidere, New Jersey. Prepared an application for an "alternative maximum allowable emission rate," under NJDEP NO_x RACT (Subchapter 19) facility-specific NO_x emission limit provisions, for three combined cycle cogeneration units at the Nutley facility. Identified NO_x control options with a feasibility/cost analysis for combustion turbines that cannot be equipped with water injection or dry low-NO_x controls. Prepared RACT analysis for an interim RACT proposal as part of a delayed compliance filing associated with a repowering project at the Belvidere facility.

Control Technology Options Analyses, Public Service Electric & Gas, Burlington, New Jersey. Conducted a study of air permitting/engineering options for repowering Unit 10 at PSE&G's Burlington Generating Station with eight Turbo Power & Marine FT-8 turbines. Netting strategies included controls on existing boiler and turbines.

Fugitive Dust Analysis

Mr. Shotts has estimated fugitive dust emissions and proposed control technologies to obtain permits for clients in industry as well as for utility companies.

Fugitive Dust Emissions, Inter-Power of New York, Halfmoon, New York. Developed estimates of fugitive dust emissions from the construction phase of the Halfmoon FBC cogeneration facility, including dust generated by the operation of various trucks, dozers, scrapers, and loaders, and from areas of disturbed earth.

Fugitive Dust Analysis, PSE&G Hudson and Mercer Coal Power Stations, New Jersey. Prepared Title V inventories and source characterization for modeling of fugitive dust emissions from coal and ash handling systems at two utility coal boiler facilities. Subsequently, developed spreadsheets to enable updating of emissions estimates for the purpose of NJDEP annual emissions statements.

Fugitive Dust Analysis, Chesterfield Temporary Coal Barge Unloading Facility, Virginia. Prepared the air permit application, including fugitive dust emissions calculations and a review of control technologies, for a temporary coal barge unloading facility.

Fugitive Dust Studies, Virginia Power, Virginia and West Virginia. Observed operating sources of fugitive dust emissions including rail car, truck, and barge coal unloading and stocking out, storage pile reclaim by bulldozing, dry ash disposal and vehicle traffic in order to evaluate compliance. Developed emissions estimates and control technology evaluations for new and existing dust sources associated with the New Fossil Station site study, the Chesterfield Temporary Coal Barge Unloading Facility and others.

Regulatory Compliance Analysis

Mr. Shotts has performed regulatory analysis for several air and non-air related projects. His duties have included regulatory reviews, impact assessment, environmental auditing, and air quality coordination.

Air Quality Compliance Audit, Mirant New York and Mid-Atlantic Generating Facilities. Conducted air quality component of internal environmental and safety audits for Mirant's coal-fired generating stations in Maryland and New York State. Tasks included site visits, interviewing operations staff and preparation of audit report sections identifying exceptional practices, deficiencies and recommendations.

Air Quality Compliance Audit, Waste Management Incorporated Saugus, Massachusetts Waste-to-Energy Facility. Conducted air quality component of an internal environmental and safety audit for Waste Management, Inc.'s Wheelabrator Technologies, Inc. (Resco) waste-to-energy electricity generating station in Massachusetts. Tasks included a site visit, interviewing operations staff and preparation of audit report sections identifying findings of compliance issues and recommendations.

Air Quality Compliance Activities, Possum Point Power Station, Dumfries, Virginia. Coordinated air quality compliance activities for the Possum Point Power Station, including notification, reporting, and compliance inspections and audits. The 1400 MW station consists of two coal-fired boilers, three oil-fired boilers, and six combustion turbines. Duties included observing visible

emissions and electrostatic precipitator operation, and reporting and inspecting extensive asbestos removal work.

Environmental Impact Statement, Federal Energy Regulatory Commission, Summit, Ohio. Prepared an air quality impact assessment for the Summit (Ohio) Pumped Storage Hydroelectric Project as a part of the FERC Environmental Impact Statement. Characterized air quality affects for construction and operation phases and compared to alternative peaking capacity additions for the region.

Radioactive Waste Processing Compliance Evaluation, North Anna and Surry Radwaste Facilities, Virginia. Evaluated aspects of radioactive waste processing and disposal options relevant to air quality. Coordinated preparation of submittals to air agencies resulting in exemptions for low-level waste processing facilities at the North Anna and Surry Nuclear Power Stations.

Air Quality Impacts and Licensing Evaluation, Virginia Power Coal Gasification Studies, Virginia. Evaluated air quality impacts and licensing issues associated with various coal gasification technologies. Analyzed environmental impacts of BGC/Lurgi technology in support of a proposal to USDOE's Synfuels Program. Prepared a licensability study for the Shell gasification process under EPRI's Site-Specific Coal Gasification Combined Cycle Studies program.

Air Quality Compliance Coordinator, Virginia Power Possum Point Ash Pond Expansion, Virginia. Served as air quality coordinator for construction of a new coal ash disposal area, which required relocation of an inactive refuse landfill. Obtained a burning permit, conducted compliance inspections, and oversaw landfill excavation to identify hazardous materials for segregation.

Environmental Liability Due Diligence Review

Mr. Shotts has managed and been involved due diligence assessments for acquisitions of utility assets including generating stations nationwide. He has participated in management presentations, site visits and data room searches on behalf of bidders, and directed teams in gathering of baseline data, identifying current and potential regulatory issues and estimating associated costs. Air quality cost assessments included allowance shortfall projections and purchases, as well as air pollution control cost estimates. Preliminary "ballpark" assessments are subsequently refined with rigorous documentation in the form of issues matrices and 20-year unit-specific and issue-specific cost projection spreadsheets.

Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC, Emissions Avoidance Study, Village of Buchanan, New York, Entergy Nuclear Northeast. Project Manager for the assessment of the potential increase in emissions of criteria pollutants from non-nuclear generating assets within New York State in the event that the Indian Point 2 and 3 nuclear generating stations were decommissioned. The assessment assumed that additional non-nuclear generation would be required within the State of New York to replace the electric generating output of Indian Point Units 2 and 3 and evaluated increase in annual potential emissions for the period of 2002 through 2005. Several different scenarios were evaluated to determine the impact on the air quality in New York State and the local area. Replacement sources examined included existing fossil

generating stations located in the entire state of New York, the Hudson Valley and New York City. To provide context for interpreting the projected emissions increases, the increases for each replacement scenario were expressed as percent increases relative to regional and statewide emissions, and the health and welfare effects associated with each pollutant and the groups most susceptible to them were tabulated.

Due Diligence Air Quality Issues Assessment, Caithness Energy Bid for York Brooklyn Navy Yard Cogeneration Facility. Assessment of air quality issues and costs for a combined cycle steam and electric generating facility in Brooklyn as input to Caithness Energy's evaluation of a bid for the Brooklyn Navy Yard facility. Tasks included data room file searches and a plant visit to interview facility operations, management and environmental compliance staff and to obtain permit and application files and compliance records. Issues were identified and and compliance cost estimates developed.

Due Diligence Air Quality Issues Assessment, Confidential Client, Orion Generating Assets. Directed assessment of air quality issues and costs for 12 fossil generating station sites and six development projects in six states as input to an evaluation of Orion Power's assets. Tasks included data room file searches, supplemented by Internet searches and agency contacts. Detailed 15-year cost estimates were developed for each unit. Cost estimates included boiler NO_x control options and acid rain and NO_x budget program allowances, as well as offsets required for projects under development. Impacts of future regulatory programs were evaluated for the fossil generating stations, including future mercury control regulations, future PM-2.5 regulations, future regional haze regulation requirements and potential settlements related to prior alleged new source review violations.

Due Diligence Air Quality Issues Assessment, PECO Energy Bid for Sithe Energies Assets. Directed assessment of air quality issues and costs for 21 fossil generating station sites in seven states, including seven in New York and five in Massachusetts, as input to PECO Energy's evaluation of Sithe Energies assets in a joint PECO/NRG bid plan. Tasks included data room file searches, agency visits to obtain permit and application files and compliance records, and detailed cost estimates for each unit. Cost estimates included boiler NO_x control options and acid rain and NO_x budget program allowances, as well as offsets required for projects under development.

Due Diligence Environmental Issues Assessment, KeySpan Energy Bid for Duquesne Power Assets. Directed assessment air quality issues and costs for seven fossil generating station sites in Pennsylvania and Ohio as input to KeySpan's evaluation of Duquesne Power & Light's assets. Tasks included participation in management presentation and site visits, review of CD-ROM documents, and 20-year detailed cost estimate projections for each unit and issue. Cost estimates included estimation of low-sulfur coal cost differentials and coal boiler SO₂ and NO_x control options, as well as acid rain and NO_x budget program allowances and increases in annual Title V emission fees.

Monitoring Analysis

Mr. Shotts has performed monitoring studies for several projects including air emissions, meteorological data, and noise. He has also participated in the maintenance, auditing and evaluation of these data collection activities.

Noise Impact Studies, Virginia Power, Virginia. Conducted noise monitoring to determine noise levels at existing facilities and background levels at sites for proposed facilities. Predicted noise impacts and recommended controls for new facilities and modifications. Negotiated noise level guarantees in new equipment contracts and served as a noise expert at public hearings.

Emissions Monitoring and Stack Testing, Virginia Power, Virginia. Participated in maintenance, audits, and studies of opacity and sulfur dioxide continuous emissions monitors. Participated in a field performance comparison study of various SO₂ continuous emissions monitors, EPA Methods 6 and 6B, and coal sampling and analysis. Coordinated compliance stack testing to ensure that agency procedures were being followed and that facilities were operating in compliance during testing.

Ambient Air Quality Monitoring Support, Virginia Power, Virginia. Assisted in installation and routine maintenance and calibration of ambient air quality and meteorological monitoring stations. Analyzed particulate matter samples to determine ambient concentrations of particulate matter, sulfates, and nitrates.

PROFESSIONAL AFFILIATIONS

AWMA Old Dominion Chapter, Secretary-Treasurer
EPRI Gas Turbine NO_x Control Committee
UARG PSD/Non-Attainment Committee

WORK HISTORY

Manager – Air Quality Engineering, TRC Environmental Corporation, 1994 - present

Senior Engineer, Enserch Environmental Corporation (formerly Ebasco Environmental), 1989 - 1994

Engineer, Virginia Power, Air Quality Department, 1981 - 1989