RESUME

THOMAS S. SPALDING
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EMPLOYMENT:
Energy Manager and Environmental Manager, , Kentucky AIr National Guard KYANG
June 2011 - November 2022
Created award winning energy program (2019) 123AW Louisville, KY
Using PVWatts and University of Louisville Students, projected savings for full deployment of solar for the base. Construction and tracked progress of 133 kW solar array for the Base Civil Engineer. Consolidated a database for basewide upgrade to energy efficient lights, installing LEDs for the flight line - first National Guard LED lighting of the flightline. Improved coverage and visibility and saved energy. Cool Roof for parts of three buildings. Saved money by identifying applicable energy rebates and filing paperwork. Improved energy consumption by 30%, won the base a $45,000 prize, leading the base into compliance with DOD directive.

Engineering Associate, Defense Contractor
Environmental Office, Kentucky Army National Guard (KYARNG)
June 2005 - June 2011
Working through the Kentucky Water Resources Institute and the Tracy Farmer Center for the Environment (University of Kentucky), Spalding's main areas of work are in water compliance issues as well as air permitting and storage tank compliance.

Minor Construction Manager (Less than 40,000 dollar jobs)
SPCC Plan Author, Certified Erosion Control Inspector and Erosion Control Plan Author.

Web manager, Adobe Acrobat form creation.

The Guard also asked Tom to work on database issues in the asbestos abatement program it runs. Became Certified Asbestos Inspector. Web manager for the Environmental Department pages in the corporate intranet. Tom executes required reports for SARA and EPCRA.

Tom evaluated wastewater bills for the Guard, resulting in savings. At the Bardstown Armory he stopped a sewer billing where none was due, and found errors in the sewer bill at the Louisville Armory which cut the sewer bill in half and resulted in a $30,000 claim for overpayments reaching back to 2000. Tom authored BMP plans in the stormwater area, SPCC plans, Groundwater Protection Plans and water discharge permits for KYARNG. He conducted the annual permit compliance report and did water sampling.

Tom managed compliance issues for all fuel and used oil tanks for the KYARNG. Tom has adapted the Veeder Root monitors. He consolidated reporting and alarms into a simple Fax protocol so the Kentucky Guard tanks are constantly in compliance.

Tom installed water saving upgrades: the DD600 Fox Environmental Diverter Valves for the numerous wash racks operated by the Kentucky Guard. Tom's entrepreneurial spirit in the project gained the confidence of the Chief of Staff's Minor Construction Committee, and in FY 2008 Tom managed the largest projects in the committee budget. Tom has completed necessary retrofits to separate storm water from sewerage at all KYARNG Maintenance Shops. Tom managed all phases of the projects, including scope of work, bidding under state procurement rules, construction inspection and invoice processing. Tom consults on water issues affecting future growth of the KYARNG.

Tom's electronic forms accelerate the ordering process for supplies. Tom has trained his associates on web authoring and form creation. Spill response supplies are ordered on-line because of Tom's work for the 70 KYARNG facilities. For the first time, compliance documents (like permits for example) have been converted to PDF format and stored in the web site for individual locations which has resulted in better access. The web site impresses inspecting authorities. For example, the most recent inspection by the Division of Water in August 2007 found no violations at the 10,000 acre Wendell Ford Regional Training Center.

Training is a core mission for the Guard and Tom has facilitated training by using the web. He developed the on-line test for the Unit Environmental Compliance Officer, a unit level environmental technical spot. He has used Adobe Acrobat to electronically collect data from the tests, to transmit the data, to automate grading of the test and automatically generate the certificates for management.

Tom has worked with Army Cooks to facilitate training. The Mobile Kitchen Trailer (MKT) required a gray water handling system. Tom has assembled two systems and is carrying through in the next fiscal year to assemble gray water handling capability for each one of the mess operations in Kentucky. Before, troops were forced to use catered food or MREs. Now training can be cheaper, more realistic, sanitary and efficient.

Due to a staffing shortage, Tom was asked to prepare air pollution permit applications. The most significant is for the new $1.4 million dollar paint booth at KYARNG KYMATES, at Ft. Knox. Tom also developed the air pollution permit application for drug interdiction operations of KYARNG and the State Police. KYARNG has trailer mounted devices with two purposes: the primary roll is to burn illegal drugs, but they also are livestock crematoria and stand ready for bird flu or other disease vector destruction in case of disaster. Tom maintains his Air Pollution Certifications and is monitoring the compliance situation for the existing Boone Center air pollution permit. He completes the emission inventory and the Annual Report. Tom has provided simple PDF forms for soldiers to calculate and record emissions where possible to complete monthly emission calculations.

The Kentucky National Guard will stand up a new asphalt team in 2012. The Air Pollution permit application was completed by Tom and special electronic spreadsheet compliance forms have been set up and training conducted to facilitate the development.

Tom used rapid prototype development to create an Asbestos Database for the KYARNG. The work resulted in an upgraded and 'Webified' version in 2007. Tom has recycling duties as well. Tom produces graphics for and is staff at the annual National Guard Association trade show and Earth Day.

LEADERSHIP RECOGNITION: Tom received the 2006 Kentucky Geologist of the Year Award from AIPG and was featured in THE BLUEGRASS GUARD, Vol. 10, Issue 2, October 2006. He was the General Chair for the 2005 National AIPG Convention in Lexington, KY. At the conference Tom organized a public panel discussion and seminar on earthquake preparedness and did a fund-raiser for Hurricane Katrina Relief, turning the money over to a regional children's charity for disbursement. The panel discussion entitled ‘Geologic Hazards and Natural Disasters, A Call to Action' analyzed best practices for earthquake preparedness communications featuring live presentation, web cast and audience question/answer.\

Tom, in his after-hour's life, installed two water treatment systems and repaired two others in Port-au-Prince, Haiti in 2011. These installations will provide several hundred orphans and school children with safe, chlorinated drinking water.

EMPLOYMENT:

Engineering Coordinator
Louisville and Jefferson County Air Pollution Control District (APCD)\l
March 2004- June 2005
Tom developed a new database approach to 112R RMP compliance program. Tom coordinated the program with outside agencies and developed the 2004 FFY Annual Report. Tom created an e-mail system that sent companies reminders of program requirements before deadlines passed (thus avoiding violations).
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Tom conducted multi-media inspections and industrial inquiries with the EPA Regional office and the National Environmental Investigation Center. Tom was also responsible for all Continuous Emission Monitor quality assurance RATA (smoke stack monitoring) tests in Jefferson County along with reporting requirements. The testing required Tom to ascend some of the tallest smoke-stacks in Kentucky. Tom explored the necessary electronic data downloads and the EPA MDC data management system.
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Tom translated the regulatory requirements of stack testing into an innovative spreadsheet format, automating some of the most complex work in environmental control. The creation was shared with co-workers to assure consistent reviews of equipment and compliance tests. Also,

the spread-sheet was shared with industry, so that they could perform more effectively and understand what to look for to satisfy the requirements. Tom wrote permits as well and has numerous evaluations to his credit for a broad range of industry:

Automotive paint shops\

Bulk petroleum terminals

Crematoria

Landfill gas-to-energy operations

Miscellaneous manufacturing operations

Plating companies

Paint manufacturers

Rail and bus terminal and maintenance operations

Tom was responsible for Potential to Emit calculations and contributed to the annual Emissions Inventory for Jefferson County.

The Mayor's Air Quality Task Force called for Tom to develop a Power Point Presentation on the current status and historical background of the ozone compliance issues facing his city. The presentation was well received by the Task Force, a group composed of both lay and air quality/environmental professionals. Certified in Air Pollution Methods 2, 3, 4, 5 and 9.

Tom, in his after hour's life, took up teaching. After receiving his Master’s Degree December 2003, Tom became an adjunct instructor at Decker College in 2004, teaching classes in database and various Microsoft products.

EMPLOYMENT:
Compliance Manager, Industrial Waste Department
May 2000 - November 2003
Inspection and Enforcement Supervisor, January 1, 1995/'96 May 2000

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Tom was Environmental Manager in the largest Pretreatment Program in the South East: Louisville and Jefferson County Metropolitan Sewer District (MSD), directing the implementation of inspection and enforcement program for industrial waste concerns. Tom issued the first permit featuring electronic signature in Kentucky.

Tom led emergency responders in a major treatment plant upset investigation in 1995 where toxic and volatile chemicals from a major company sent over 60 sewer workers to the hospital. The company was identified using photo-ionization techniques which Tom pioneered at MSD. Tom was assigned the task of shutting down the company discharge (DuPont 1995). During the incident, Tom met with MSD operations personnel and was given authority to re-open the affected parts of the main MSD treatment plant, the Morris Forman Wastewater Treatment Plant (MFWTP). Tom gave the \'93all clear\'94 for the re-introduction of MSD workers in the work area. Tom was directly responsible for compliance and enforcement issues for over 106 major industries in Louisville. Working in team atmosphere using PC network, Tom's automated calculation of Significant Non-Compliance (SNC), and his negotiations and drafting Consent Orders turned around SNC. SNC decreased from 46% in 1991 to 4% during his tenure.

Tom developed a pilot program to address restaurant grease blockages. Tom had the idea to use a video education program. The video and grease program became a national model. After a gradual program working with the hauling industry, Tom led MSD in banning grease and septage. Several private entities started or grew as a result of privatizing this aspect of MSD\'92s business. MSD sludge quality improved. Toxic metals were reduced and now MSD sells 'Louisville Green,' a pelletized sludge fertilizer instead of land filling.

Tom trained staff in the use of Microtox and respirometer equipment for the rapid characterization of potentially toxic hauled or special wastes. Tom identified nephelometry as a critical monitoring tool to reduce rubber contamination at the largest wastewater treatment plant in Region 4, EPA; the Morris Forman Wastewater Treatment Plant. Tom developed turbidity criteria for the analysis of rubber emulsions and managed rubber reduction enforcement cases. Tom verified tank and piping integrity using quantitative fluorometric dye assessment. Tom managed a pilot plant study to treat rubber emulsion.

Innovation in automated turbidity metering provided the breakthrough tool to identify and eliminate rubber through pollution prevention. Proof of the technique was captured in a Master's Thesis done under Tom's mentorship (Evaluating Nephelometry as a Possible Monitoring Tool for Rubber Intrusions, Whitney Lynn Cecil, Department Chemical Engineering, Speed Scientific School, University of Louisville, November 1997).

At the request of his director, Tom assisted High School students in 2002. The students won the state science competition and then competed in the first national competition sponsored by the Water Environment Federation and ITT Industries.

WEF Member Association: Kentucky-Tennessee WEA Student's Names: Brian Kim and Chris Rezvanian. Project Title: \ul \ulc0 The Utilization of Optical Brighteners as an Indicator for Non-point Pollution Sources Along Beargrass Creek. School: DuPont Manual High School\
In 2001-2002, Tom led the MFWTP in a study of the mass of solids in the influent wastewater '96 which had mysteriously doubled between August and December 2001. Tom identified a fleet of trucks conducting unsupervised activity in the MFWTP collection system and issued orders

that stopped the discharges. Tom's group became responsible for treatment plant capacity issues.

Using computer database techniques, Tom compressed the time for his business cycle from 2 months to three days.
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Tom's other duties included writing the annual State Report (about the industrial users) and he responded to state inspections of his program. He organized industrial user conferences in Louisville. Seminars led by Spalding occurred every other year. The 2000 seminar was held jointly with FEMA personnel and covered Hazmat/Flooding issues. Information technology innovations include airport joint venture using web forms in a password-protected environment to collect anti-icing data. His efforts won the 2001 Watershed Award from the KYTNWEA for the Airport Pollution Prevention Team (AP2T) project.

In 2002, Tom led a consultant investigation in quantitative dye assessment of potential dry weather sewer interceptor leaks in the Beargrass Creek Watershed. Tom also worked with Tom Rockaway in developing an earthquake impact model for Jefferson County, Kentucky.
Recognition: Promotions, pay increases, commendable evaluations, KYTNWEA Watershed Award - Airport pollution prevention activity (AP2T)

During his tenure at MSD, Spalding went to school at night and periodically taught after hours at KCTCS in Business and Technology. He secured a Master of Arts degree. He taught the following: HTML, Word, Excel, Access and PowerPoint.

Tom was promoted from \ul Industrial Waste Specialist in 1994 at MSD.

While a specialist, Tom directed efforts that successfully corrected illegal discharges causing plant upsets at the Industrial Subdivision WTP; and implemented a new 'mini-permit' system for industrial users; co-author of revised wastewater discharge regulations; co-author of Enforcement Response Plan. Tom drafted provisions for spill notification in Industrial User Permits. Tom's other duties included Project Management in groundwater studies, environmental assessment, pollution prevention, Hazmat ordinance compliance, RCRA and SARA reporting, regulatory comments and development, septage hauler permitting. Author and Editor of the STREAMLINE, a newsletter for industrial users, consultants and attorneys in Louisville.

Tom's emergency responses during this time frame included two sewer explosions, where detective work by Tom and his project team resulted in successful closure of leaking underground tanks, protection of the collection system and protection of the public.
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EMPLOYMENT:
Assistant Environmental Manager and Senior Geologist
ATEC Environmental Consultants\

January 1989 to January 1990.

Tom was a project manager of underground storage tank assessments, emergency spill response, hazardous waste site assessments, real estate audits and corrective actions. Tom was certified to perform level B hazardous waste investigations and developed site investigation and State required compliance plans in the hazardous waste area.
Spill response included an overturned gasoline tanker and associated clean-up activity.

Tom was the ranking environmental scientist in the Louisville office and was responsible for the quality assurance of environmental investigations, for the budgets of the investigations and for the timely delivery of reports. In addition to report writing and editing, Tom developed contracts and proposals for new projects.
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EMPLOYMENT:
Environmental Geologist Supervisor (and other positions)
Groundwater Branch, Kentucky Division of Water
October 1984 to December 1988

Tom served as a Supervisor at Kentucky\'92s Wellhead Protection Program with the Kentucky Department for Environmental Protection\'92s Division of Water. Tom designed regional and site specific groundwater investigation plans, and Tom designed a database for managing data for a new State Program which involved capture of groundwater data from various state agencies. Among the agencies that were coordinated in the effort were the Kentucky Geological Survey, the Cabinet for Human Resources (the state health authority) the Department of Surface Mining Reclamation and Enforcement, and the Division of Waste Management. Other significant work included development of policy and regulatory direction for the Commonwealth. Tom served as coordinator of the Kentucky Groundwater Advisory Council. Tom drafted regulations for the State, which featured the Federal groundwater classification system for groundwater protection, and also produced the \ul \ulc0 Kentucky Groundwater Protection Strategy.

Recognition: Promoted three times, achieving supervisory level in October of 1987.
Recognized with four consecutive 'exceeds ratings in department employee evaluation system.
Designed, coordinated or taught at the following seminars: 1987 Kentucky Water Well Driller

Seminar, 1987 Underground Storage Tank training session, and 1987 statewide Health Department Groundwater Training Seminars.

Between October 1984 and 1989, Tom enforced environmental regulations. Along with responsibilities in new oil field regulation, he worked with new regulations concerning industrial and municipal wastewater treatment facilities, dams, and potable water supplies (both surface and groundwater). Carried largest case load in enforcement section. Co-leader of conference team, meeting private sector and government leaders in over 80 penalty negotiations. Prepared legal documents and reports concerning environmental violations.

EMPLOYMENT:
Oil and Gas Inspector
Kentucky Division of Oil and Gas
August 1983 to October 1984
Tom enforced well spacing and engineering statutes. He directed the use of casing and cementing of casing for fresh water protection and maintained records on and monitored the progress of several hundred oil wells in his area (Clinton County, Kentucky, which, according to Petroleum Information\'92s RESUME 1984, was the fourth most intensively drilled county in the United States).

Drilling progress of cable tool, air rotary and at least one mud rotary rig was done to assure timely driller attention to plugging routine. Monitored progress of up to three plugging operations at once. Detected illegal drilling and plugging activity. Extra work was required of drillers, resulting in drill out of 12 wells, where plugging instructions were not followed.

Break-out of pressurized sulfur water from one well in the program was eliminated. Detective work on site revealed that inadequate cement was used. Permittee was required to re-plug the pressurized well.

Collected sufficient information to obtain warrants under statute. Obtained an injunction. Used personal correspondence to drillers as a preliminary warning to all enforcement actions where possible. Supported warrants against out of state drillers that jumped state lines, catching one

Responded to citizen complaints 24/7. Complaints included fire, oil spill, waste, and one explosion. Collaborated with Division of Blasting to clean-up a dump of improperly discarded blasting caps.

Recognition: Corps of Engineers awarded a Certificate of Appreciation in recognition of protection of water quality at Dale Hollow Lake. Stopped an explosive situation involving an oil well.

AFFILIATIONS:
Past President, past Secretary and Webmaster, Kentucky Section - American Institute of Professional Geologists (AIPG), CPG #9973 and PG #89, Past KY-TENN Water Environment Association Pretreatment Chair.

EDUCATION:Master of Arts, Computer Resources and
Information Management,
Webster University (December, 2003)

Bachelor of Science, Geology, University of Louisville, 1983

Spring, 1986: Groundwater Monitoring and Evaluation,\'94 University of Kentucky Graduate School. Class work included contamination case studies as well as interpretation of drawdown curves.

Summer 1987: Karst Hydrology,\'94 Western Kentucky University Graduate School. Instructor Tim Atkison, University of East Anglia. Class work required quantitative and qualitative dye tracing in environmental problem solving. Final report documented findings from rhodamine wt injection into a sewage treatment lagoon and qualitative trace of the longest cave system yet discovered in Franklin County, Inner Bluegrass Physiographic Region of Kentucky.

Educational Highlight:

The web strategy known as The Digital Utility created a series of presentations at venues provided by MSD management, the Kentucky Division of Water, the KYTNWEA and the 2001 WEFTEC in Atlanta, Ga. The Web initiatives pursued by MSD were explored as a part of his Master\'92s studies. MSD includes many of Spalding's ideas on its web page and e-mail services: database interactivity, customer services such as compliance information about industrial users, including e-mail reminders to customers and automatic reports for MSD inspectors to compress the compliance cycle, a business cycle in regulation, and RFPs served over the web.

Spalding has been an adjunct instructor of information technology classes at the Jefferson Community College, Louisville, KY, night school, and served on the Information Technology Advisory Board. Classes Spalding instructed include, Database Management, Post-advanced Microsoft Office, and HTML. 2000-2002.

Adjunct instructor at Decker College, Louisville, KY, 2004-2005.

Technical Publications and/or Presentations:

Spalding, T. S., contributor, \'931984 Report to Congress on Water Quality,\'94 Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water, 1984.

Spalding, T. S., Requirements Analysis Report for Groundwater Data Management, Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water, 1986.

Spalding, T. S., contributor, 1986 Report to Congress on Water Quality,Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water, 1986

Spalding, T. S., Schindel, G. M., Trimble, D. C. and Dinger, J., Kentucky Groundwater Protection Strategy,\'94 Kentucky Natural Resources and Environmental Protection Cabinet, 1987.

Spalding, T. S., Schindel, G. M., Trimble, D. C., Currens, J. and Odell, P., Wellhead Protection and the Private Water Supply Well: Gateway Area Development District, Kentucky\'94 Kentucky Division of Water, 1988

Spalding, T. S., Trimble, D. C., and Schindel, G. M., \'93A Groundwater Protection Strategy for Karst Terrains,\'94 Conference on the Environmental Problems in Karst Terrains and Their Solutions, Nashville, Tennessee, November 16-18, 1988.

Spalding, T. S., contributor, \'931988 Report to Congress on Water Quality,\'94 Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water, 1988.

Spalding, T. S., Yarnell, W., Protecting Our Drinking Water: Wellhead Protection in Kentucky, The Kentucky City, The Kentucky Municipal League, July 1989.

Spalding, T. S.,Hydrogeologic Setting of a Wastewater Treatment Lagoon in a Karstified Carbonate Aquifer, Inner Bluegrass Karst Region, Franklin County, Kentucky, 3rd Annual Kentucky Water Resources Symposium, University of Kentucky, March, 1991.

Spalding, T. S., Melisizwe, L. M. and Dong, Bochang,Strategic Manhole Monitoring: Enhancements to Supplement Permits for Headworks Wasteload Contributions, Water Environment Federation, 65th Annual Conference and Exposition, New Orleans, Louisiana, September 1992.

Spalding, T. S., Pollution Prevention Toolbox of a Sewage Treatment Authority International Association on Water Quality, 17th Biennial Conference, Budapest, Hungary, July, 1994.

Spalding, Tom, Fitzgerald, Patrick, and Pettyjohn, Jeffrey. Closure of the MSD Septage Receiving Facility. October 1998 Water Environment Federation. WEFTEC 1998

Spalding, T. S., Lee, J., Quick Fix to Stop Gasoline from Leaking Underground Storage Tanks (Lusts) from Entering Sewer Systems,\'94 1995 KY-TN WEA Annual Meeting, Lexington, Kentucky, 1995.

Spalding, T. S. Rubber Emulsions in Wastewater,\'94 September 2000. National Natural Science Foundation of China and International Water Association, Specialty Conference. Critical Technologies to the World in the 21\up6 st\up0 Century: Pollution Control and Reclamation in Process Industries
University of Petroleum, Beijing, China.2000.

Spalding, T. S., and Sweeney, Michael W., PhD., PE The Digital Utility Age: Moving from Bricks to Clicks,\'94 October 2001 Water Environment Federation. WEFTEC 2001, Atlanta, Ga.

Spalding, T. S.Adobe Acrobat and Paperwork Reduction at MSD,\'94 MSD Special Industrial User Conference, Louisville and Jefferson County Metropolitan Sewer District, Louisville, KY, August 2002.

Spalding, T. S. Geologic Hazards and Natural Disasters, a Call to Action,\'94 2005 AIPG National Meeting, Lexington, KY October 12, 2005

Spalding, T.S. Camp Nelson: the Newest National Monument - Geologic Notes on Fort Placement and Strategy in Kentucky and the Western Theater of Operation in the American Civil War , VOLUME 56 NUMBER 3, JUL.AUG.SEP 2019 TPG

Spalding, T.S. The Future of Geology and the Military: at the CO2 Frontier
Volume 57 Number 2 APR.MAY.JUN 2020, TPG