Andrew D. Nicholson, Ph.D.
Senior Science Advisor

Education and Credentials

Ph.D., Geochemistry, Colorado School of Mines, Golden, Colorado, 1993

B.S., Geology, Michigan State University, East Lansing, Michigan, 1985

Continuing Education and Training

Hazardous Waste Operations and Emergency Response 40-Hour Certification (1991–2009)

Hazardous Waste Operations Management and Supervisor 8-Hour Certification (1991)

First Aid and CPR Certified (2004)

Professional Affiliations

Phi Beta Kappa

Phi Kappa Phi

Guest Lecturer

Co-instructed one-day course on environmental forensics for CLE credit and New Jersey LSRP credentials, 2018, 2019

Professional Profile

Dr. Andrew Nicholson is a geochemist with 25 years of experience assessing the environmental impacts and chemical fate at industrial facilities and mining sites. Dr. Nicholson has conducted analyses of the source and mobility of petroleum hydrocarbons, metals, PCBs, and other chemicals in sediment, soil, and groundwater. His diverse, interdisciplinary experience includes predicting future water quality for the permitting of mines, fingerprinting petroleum hydrocarbons in the environment for litigation, and achieving regulatory approval of monitored natural attenuation as a remedy for metals and organic compounds in groundwater. His work has included extensive analysis of the behavior of acids, metals, radionuclides, and organic compounds in the environment at mines and in chemical manufacturing, petroleum production, and industrial settings.

Dr. Nicholson has authored numerous articles and book chapters, including the chapter on groundwater chemistry in the most recent edition of *Groundwater and Wells*, the standard reference for the water well industry, and he was a coauthor and editor on the application of modeling techniques at mining and metal processing sites. He has served as an expert witness on a variety of matters, including determining the sources of petroleum hydrocarbons at manufactured gas plant and petroleum sites.

Relevant Experience

Litigation Support

Confidential Gas Station Site, New York—Determined the age of MTBE releases from a service station in New York for a cost recovery case. Testified in state court on results of findings.

Confidential Petroleum Site Litigation, New York—Evaluated the contribution of petroleum contaminants from a group of terminals to a larger CERCLA site in New York State. Evaluated the composition of the petroleum products handled onsite and applied forensic techniques to compare these products to the larger sediment site and other sources to the site including publicly owned treatment works outfalls, urban runoff, chemical manufacturing, and manufactured gas plant discharges.

285 Century Place
Suite 190
Louisville, CO 80027

720.465.3330
anicholson@integral-corp.com

Confidential Gas Station Site, New Jersey—Provided technical support for a mediation on an insurance cost recovery case for a gas station. Determined the age of petroleum contamination in the ground and demonstrated the sources of contamination from specific service station operations.

United States v. Apex Oil, Hartford, Illinois—Testified as an expert witness in federal court in a cost recovery case evaluating the sources of hydrocarbons based on lead, gasoline additive, and PAH data.

United States v. WSDOT, Tacoma, Washington—Expert witness in a cost recovery case evaluating the contribution of PAHs from a former manufactured gas plant site to estuary sediments through stormwater sewers.

PCB, PAH, and Metals Source Allocation in Harbor Sediments, Great Lakes, U.S.—Developed and implemented a program to determine the quantitative loading of contaminants to a harbor in the Great Lakes. This work showed the importance of two previously unidentified sources of contaminants, and that the chemical fingerprints of PCBs, PAHs, and metal composition were consistent with large amounts of sediment contamination coming from these sources.

Confidential Site, Virginia—Evaluated the mobility, bioavailability, and transport of historical zinc discharges to a river from a rayon manufacturing facility in support of a natural resource damage evaluation.

Chemical Fingerprinting of Petroleum Hydrocarbons, Texas—Developed a fingerprint of petroleum hydrocarbons that quantitatively distinguished petroleum condensate from leaded and unleaded gasoline.

Fate and Transport Analysis, Superfund Site, Rocky Mountain Region—Conducted a program to determine sources and ages of petroleum hydrocarbons, PCBs, and creosote in the subsurface at a Rocky Mountain Superfund site.

Petroleum Refinery and Distribution Terminal, New York—Developed an allocation of free product underlying a refinery and a petroleum distribution terminal.

Evaluation of Arsenic Contamination, New Jersey—Developed procedures to allocate arsenic contamination between a pesticide manufacturing facility and a pyrite ore processing facility in estuarine sediments. Methods included lead isotope, sulfur isotopes, and electron microprobe analyses.

Fate and Transport Analysis for Petroleum Facilities, Texas—Developed novel tools to quantitatively apportion hydrocarbon plume composition among two gasoline handling facilities and a leaking petroleum pipeline.

Evaluation of Concrete Degradation, Boston, Massachusetts—Investigated geochemical controls on cement stability in marine sediments and fill soils to determine the mechanism of concrete degradation in the Fort Point Channel in Boston Harbor in support of litigation regarding liability

related to a building's foundation failure. Implemented a field sampling and analysis program that included drilling, vibracoring, and analysis of samples at three separate laboratories. This work discovered a previously undocumented mechanism of concrete degradation due to the presence of high levels of sulfate and sewage, and low reactive iron content in the surrounding sediments.

Former Solvent Recycling Facility, Southeastern U.S.—Developed methods to evaluate the age of mixed chlorinated solvent and hydrocarbon contamination at a former solvent recycling facility in the southeastern U.S. in support of cost allocation litigation. Methods used included careful characterization of the redox state of local groundwater, evaluation of the bacterial activity at the site, and hindcasting the original composition of the spill based on the abundance of chlorinated degradation products in the groundwater.

Insurance Litigation, Antifreeze Recycling Process, Massachusetts—Investigated the causes of silica precipitation in an antifreeze recycling process, using wet chemical, x-ray diffraction, electron microprobe, and geochemical modeling techniques in support of insurance litigation on product failure. Results of this work indicated that metal contaminants in the used antifreeze cause the precipitation of sodium silicate corrosion inhibitors.

Lone Tree EIS Litigation, Valmy, Nevada—Technical expert supporting litigation on an environmental impact statement (EIS) in Nevada. Issues involved included establishing appropriate baseline conditions for the EIS, pit-lake chemistry, and ecological effects, and evaluating the potential degradation of groundwater.

Arsenic Evaluation for a Pesticide Manufacturing Facility, Minnesota—Developed a technique to predict arsenic concentration in soils from atmospheric dust deposition from a pesticide manufacturing facility in support of ongoing toxic tort litigation.

Geochemical Support for Dispute Resolution, Rocky Mountain Region—Provided geochemical support for cost allocation in an alternative dispute resolution hearing at a copper deposit in the Rocky Mountain West. Reviewed geochemical data, ore deposit geology, and site geochemistry to develop lines of technical questioning during the hearing.

Mercury Toxicity Analysis, New York—Used the geochemical model MINTEQA2 to evaluate the speciation and toxicity of mercury in the outfall of a mercury chlor-alkali plant into a harbor for a confidential client involved in insurance litigation.

Organic Geochemistry

Sour Gas Evaluations, Kemmerer, Wyoming—Evaluated the compositional difference of hydrocarbons produced in sweet and sour gas fields in thrust belt gas fields of southwestern Wyoming.

Multimedia Fate and Transport Analysis, Pascagoula, Mississippi—Technical lead in the analysis of the mobility of multiple compounds in groundwater in 10 different areas of concern at a large oil refinery. Responsible for the design and implementation of the hydrologic and geochemical

characterization, the ongoing monitoring plan, and interpretation of the data in all of the areas of concern (AOCs). Communicated this work on a regular basis to EPA Region 4, the lead regulator on the site. The work resulted in monitored natural attenuation being a selected remedy at eight of the AOCs. The analysis led to the refinery receiving the CA 550 Environmental Indicator (groundwater migration under control) and the CA 750 Environmental Indicator (construction complete).

Evaluation of Groundwater Discharge to an Industrial Estuary, Pascagoula, Mississippi—Technical lead evaluating the geochemistry and hydrology of groundwater discharging to the local estuary, and potential remedial approaches to the issue. Supervised the development of a detailed groundwater model to evaluate remedial alternatives including natural attenuation, flow-through reactive walls and groundwater collection trenches. Presented the results of these studies to EPA Region 4 staff for approval and for certification of the CA 550 and 750 RCRA Environmental Indicators.

Whitehorse Refinery, Whitehorse, Yukon Territories—Evaluated the chemical fingerprint of different hydrocarbon sources over a period of 50 years at a former refinery and barge dock.

Evaluation of Sediment Fate and Transport, Minnesota—Evaluated the observed changes of dioxin, furan, PAH, and metals chemistry in sediment at a Superfund site in the upper Midwest. Evaluated chemical fingerprints of these compounds and determined that the apparent increase in contaminant concentrations was simply due to differences in EPA-mandated sampling techniques and not due to new releases to the system.

Belleville Landfill, Belleville, Michigan—Conducted an evaluation of the mobility, toxicity, and bioavailability of PCBs, PAHs, and cyanide in the stream sediments receiving outfall from a leachate treatment facility for a hazardous waste landfill in Michigan after a catastrophic release. Work was conducted under intense regulatory scrutiny, with the state agencies collecting splits of all samples. Collected all samples and negotiated the ultimate solution with State of Michigan regulatory agencies.

Former Chemical Manufacturing Facility, New Jersey—Evaluated the mobility of mercury, lead, zinc, copper, manganese, and arsenic in groundwater, surface water, and estuarine sediments at a former mercury chemical manufacturing facility in New Jersey.

Refinery Closure, Kenai, Alaska—Developed a quantitative rate of petroleum degradation at a former oil refinery site based on the organic, carbon isotopic, and alkalinity data in the plume.

Geochemical Investigation at a Former Landfill Site, Maryland—Conducted a geochemical investigation of manganese and vinyl chloride geochemistry and mobility at a former landfill site. Results of the study indicated that vinyl chloride and manganese were being attenuated in the aquifer, and that these compounds would not migrate off site.

High Production Volume Test Plan Review—Evaluated the chemical toxicity and composition of petroleum coke for EPA's High Production Volume Chemical Program. Work included developing structure–activity relationships based on the PAH chemistry of the coke to minimize testing costs.

Tributyltin Consortium—Developed a sensitivity analysis, the MAM-PEC model, to predict sediment loading and toxicity of tributyltin to sediments.

Terra PAH Peer Review—Served on a peer review panel evaluating a statistical model to assess the toxicity of complex mixtures of PAH compounds.

Mining and Metals Chemistry

Mine Waste Evaluation, Montana—Conducted an investigation evaluating the sources of mine wastes at a metals mine tailings deposit for source allocation litigation. Supervised the collection of more than 600 samples in a soil boring program, designed a database, and developed new analytical methods to determine mine waste sources. This study integrated new information on ore deposit chemistry, the use history of the area by ore processors and railroads, the fate and transport of metals in soils, geotechnical properties of mine wastes, historical ore processing techniques, and sediment transport to determine sources of wastes.

Gold Mine Closure, South Dakota—Evaluated the potential environmental liabilities at closure of an operating gold mine that had been in continuous production for more than 125 years, including those related to mercury leaching from historical stamp-mill tailings, pit lake water quality, waste rock seepage water quality, and future underground mine discharge water quality.

Evaluation of Arsenic Transport, Southern California—Evaluated the mobility and speciation of arsenic in soils and groundwater at the site of a former brass refinery in Southern California. Assessed the mobility of arsenic in slag from the site using electron microprobe and laboratory bench testing methods. Based on the soil and groundwater data, developed a conceptual site model of arsenic transport at the site.

Mercury Evaluation at a Gold Mine Site, Nevada—Evaluated the mobility of high-level mercury concentrations (e.g., > 1 mg/L) in groundwater associated with a cyanide heap leach facility at a gold mine in Nevada.

Evaluation of Acid Consumption in a Copper Leaching Process, Arizona—Developed experimental and modeling methods to predict the neutralization capacity of silicate minerals at a proposed copper heap leach SX/EW copper processing facility based on laboratory experiments and the geochemical reaction path model EQ3/6.

Metals Bioavailability to Wildlife, Texas—Assessed the bioavailability of metals to wildlife at a former petroleum refining facility in Texas. The results of this study were used to develop ecologically protective soil screening levels.

Arsenic Groundwater Source Evaluation, Texas—Evaluated soils and groundwater to predict the sources of arsenic in groundwater at a former petroleum refinery in Texas. The results of the study showed that arsenic was derived from the mobilization of natural sources due to past petroleum releases, not due to arsenic releases at the site.

Batu Hijau Mine Permitting, Sumbawa, Indonesia—Conducted and managed a multidisciplinary investigation for a proposed Indonesian copper-gold mine to predict the effects of mining on local water resources and determine the water quality in the resulting pit lake. The coupled hydrologic-geochemical model incorporated hydraulic inflows, geochemical source terms, diffusive mixing, oxic and anoxic geochemical reactions, and site-specific geology based on the geologic block model. Results of this study were presented to Indonesian regulators for the ANDOL (Indonesian EIS), joint venture partners, and financial institutions in the due diligence process.

Climax Mine, Climax, Colorado—Evaluated molybdenum, manganese, and fluorine chemistry in surface water and sediments downgradient of a molybdenum mine in Colorado in support of permit negotiations with EPA and the State of Colorado.

Lone Tree Mine Permitting, Valmy, Nevada—Managed a multidisciplinary pit-lake water quality study for a Carlin-type open-pit mine in Nevada in support of an EIS. Data collected in this study also were applied to evaluate the weathering of waste rock at the mine. Results of the pit-lake study were used to model the transport of arsenic, fluoride, and antimony downgradient of the pit lake.

Pit Lake Water Quality Evaluations, Nevada—Primary geochemist involved in the prediction of pit lake water quality in more than 20 pit lakes. Fifteen of these studies were technical support of EIS documents at mines in Nevada.

Wood-Treatment Facility Closures, Texas and Missouri—Designed and implemented programs that achieved clean closure without site remediation at two chromated copper arsenate wood treating facilities in Texas and Missouri. These cleanup standards evaluated protection of both groundwater and human health, based on bioavailability, metal speciation, and metal mobility in soil.

Evaluation of Arsenic in Groundwater, Lone Tree Mine, Nevada—Managed and implemented a geochemical evaluation to determine the causes of increased arsenic in dewatering well discharge at a mine in Nevada. The study involved evaluation of regional and dewatering well chemistry data, exploration assay data, site mineralogy, and regional geology and hydrology to determine the cause of the increase. Represented the mine in negotiations with regulators in hearings on the mine's discharge permit violations.

Mineralogic Controls on Bioavailability, Butte, Montana—Used the reaction path modeling package EQ3/EQ6 to understand the evolution and weathering of lead oxide minerals and galena in soils and mine waste at a Montana Superfund site. Model paragenesis matched the observed paragenesis of lead minerals in the soil. These data will be used to determine cleanup levels at this site.

Pit Lake Water Quality Evaluation, Nevada—Used the equilibrium geochemical models MINTEQA2 and PHREEQE to simulate the mixing of acid-bearing waters with carbonate groundwater. Bench-scale experiments and modeling demonstrated that adsorption to iron

hydroxide controls the dissolved concentrations of arsenic, lead, cadmium, zinc, and copper in mine drainage.

Application of Red Mud By-products in Groundwater Remediation, Miami, Arizona—Evaluated the chemical and physical properties of a red mud, a by-product of aluminum ore processing, as an amendment to neutralize acid and metals in a groundwater plume formed from copper leaching operations.

Review of Site Groundwater Chemistry, Confidential Location—Reviewed site soil and groundwater chemistry data for due diligence related to the purchase of South American bauxite mine. Work included evaluating general options to manage the disposal and reclamation of red mud and other wastes at the facility.

Study of Mercury Speciation at an Industrial Site, New Jersey—Designed and implemented a study of mercury speciation in soils at an industrial site in New Jersey. Utilized microprobe, sequential extraction, and visual mineralogical analyses to characterize the distribution of mercury species in soils. The data were then used in conjunction with *in vitro* assays of soils to develop mercury bioavailability factors for the site. This work is the first acceptance of a site-specific mercury bioavailability standard by the State of New Jersey.

Pinal Creek Aquifer Studies, Miami, Arizona—Evaluated the geochemical controls of the mobility of an acidic plume in an alluvial aquifer downgradient from several copper leaching operations.

Water Quality Effects of an Iron Mine, Northern Michigan—Implemented a study of acid rock drainage and the impact of iron precipitates on fish for a natural resource damages lawsuit at a closed iron mine in northern Michigan.

Evaluation of Mercury Speciation at a Soil Incineration Facility, New Jersey—Evaluated the speciation of low-level (<2 ppm) mercury in soils at a soil incineration facility at a site primarily contaminated with organic solvents. This work focused on evaluating how the speciation of mercury in soils affects mercury air emissions from the facility.

Soil Treatment Study, Mississippi—Used the reaction path modeling package EQ3/EQ6 to determine optimum concentrations of phosphate soil amendments needed to reduce the solubility and bioavailability of lead at a harbor's ore loading facility.

Evaluation of Metal Leaching, Northern Rocky Mountains—Determined the rate of arsenic, copper, lead, and zinc leaching from soil, slag, and mine tailings at a Superfund site in the northern Rocky Mountains using column leaching experiments on intact soil columns in support of natural resource damage litigation. The model PRZM was used to predict basin-wide metal loading to groundwater for an ecological risk assessment.

Arsenic and Chromium Mobility Analysis, Wilmington, Massachusetts—Used the geochemical model MINTEQA2 to identify aquifer zones and to evaluate remediation scenarios for a remedial investigation and feasibility study at a Massachusetts tannery. Calculations demonstrated the

effects of organic complexation on chromium solubility, the controls of arsenic methylation, and the effects of sulfide mineral precipitation on iron, copper, and lead concentrations in groundwater.

Other Projects

Geochemical Analysis Course Development, Golden, Colorado—Developed new laboratory and field exercises for a graduate-level analytical geochemistry course, including exercises in organic extraction, sampling of rocks and soil, and analysis of acid mine drainage.

Chemistry Department Safety Analysis, Golden, Colorado—Assisted in the development of a new safety policy for the Colorado School of Mines Department of Chemistry as the graduate student member of the departmental safety committee. Work included safety inspections, hazardous materials response, and development of a waste disposal plan.

Kelly Air Force Base Metals Mobility, San Antonio, Texas—Designed and managed a study to evaluate partitioning of priority pollutants between soil and groundwater at Kelly Air Force Base. This work was the first attempt on record to establish inorganic cleanup standards under risk reduction rules promulgated by the State of Texas.

Testimony Experience

Court Testimony

Strong Oil Company, Inc. v. Zurich American Insurance Company. Supreme Court of the State of New York, County of Suffolk.

Deposition Experience

Georgia-Pacific Consumer Products LP v. NCR Corporation. U.S. District Court for the Western District of Michigan (two depositions).

Wild Earth Guardians v. IRG Bayaud et al. U.S. District Court for Colorado.

NL Industries, Inc. v. ACF Industries, et al. U.S. District Court for Western District of New York.

2134 Western, Inc v Texaco, Inc. Superior Court of the State of Washington in and for the County of King.

Publications

Nordstrom, D.K., and A. Nicholson (eds). 2017. *Geochemical Modeling for Mine Site Characterization and Remediation*. Volume 4. Society for Mining and Mineral Exploration, Englewood, CO.

Nicholson, A. 2007. Groundwater chemistry. In: *Groundwater and Wells*, 3rd Edition. B. Sterrett (ed). U.S. Filter, Johnson Screens.

Helgen, S., A. Davis, and A. Nicholson. 2007. Apportioning mining waste at a Superfund site using four-component linear mixing, Lower Area One, Butte, Montana, USA. *Environ. Forensics* 8:107–118.

Suedel, B., A. Nicholson, C. Day, and J. Spicer. 2006. The value of metals bioavailability and speciation information for ecological risk assessment in arid soils. *IEAM* 4(2):355–364.

Davis, A., B. Howe, A. Nicholson, and K. Hoenke. 2005. Use of geochemical forensics to determine release eras of petrochemicals to groundwater, Whitehorse, Yukon. *Environ. Forensics* 6:253–271.

Nicholson, A., S. Helgen, and A. Davis. 2004. Response to comment on: Nicholson et al. 2003. Elements influencing cost allocation in the Pinal Creek Aquifer, Arizona, USA. Part II: Geochemical controls on groundwater quality recovery. *Environ. Forensics* 4(4):271–278.

Helgen, S., A. Davis, and A. Nicholson. 2003. Elements influencing cost apportionment in the Pinal Creek Aquifer, Arizona USA. Part I: Geochemical Fingerprinting and Source Delineation. *Environ. Forensics* 4:255–269.

Nicholson, A., A. Davis, and S. Helgen. 2003. Elements influencing cost apportionment in the Pinal Creek Aquifer, Arizona USA. Part II: Identification of Geochemical Controls on Remediation Time. *Environ. Forensics* 4:271–286.

Nicholson, A. 2003. Incorporation of silicate buffering in predicting acid rock drainage from mine wastes: A mechanistic approach. *Mining Engineering* 55(2):33–38.

Emami, N.K., A. Nicholson, and J. Wren. 1998. Microbiological attack on concrete: A threat to concrete infrastructure. International Conference on Forensic Engineering: A Professional Approach to Investigation, London, England, September 28–29, 1998.

Nicholson, A.D., T. Hanna, J. Mansanti, J. Westfall, and B. Braginton. 1996. Evolution of groundwater chemistry during dewatering: Lone Tree Mine, Nevada. Geological Society of America Annual Meeting, October 31, 1996. Denver, CO.

Kempton, H., D. Goode, D. Atkins, A. Nicholson, C. Travers, and A. Davis. 1995. A model for predicting post-closure water quality in mine pit lakes. In: Proc. of the Mine Closure Conference. March 29–31, 1995. Nevada Mining Association, Reno, NV.

Ruby, M.V., A. Davis, and A. Nicholson. 1994. *In situ* formation of lead phosphates in soils as a method for immobilization of lead. *Environ. Sci. Technol.* 28(4):646–654.

Link, T.E., M.V. Ruby, A. Davis, and A.D. Nicholson. 1994. Soil mineralogy by microprobe: an interlaboratory comparison. *Environ. Sci. Technol.* 28(5):985–988.

Nicholson, A.D. 1993. The control and effects of thermochemical sulfate reduction, Whitney Canyon-Carter Creek Field, Wyoming. Ph.D. Thesis. Colorado School of Mines, Golden, CO.

Goldhaber, M.B., and A.D. Nicholson. 1993. Thermochemical sulfate reduction as a source of sedimentary H_2S [abstract]. Geological Society of America Abstracts with Programs 25(6):21–22.

Davis, A., J.W. Drexler, M.V. Ruby, and A. Nicholson. 1993. Micromineralogy of mine wastes in relation to lead bioavailability, Butte, Montana. *Environ. Sci. Technol.* 27(7):1415–1425.

Reynolds, R.A., A. Nicholson, M. Goldhaber, S. Coleman, J. King, C. Rice, M. Tuttle, and D. Sherman. 1990. Diagnosis for greigite (Fe_3S_4) in Cretaceous beds, North Slope, Alaska, and Holocene sediments, Lake Michigan. *Eos* 71:1282–1283.

Presentations / Posters

Nicholson, A.D., and P. Zimmermann. 2019. Small party issues in large sediment site allocation: A technical framework for decision-making. Platform presentation at Tenth International Conference on the Remediation and Management of Contaminated Sediments, New Orleans, LA. February 11–14.

Nicholson, A. 2018. Environmental modeling at mine sites: What are the regulatory and data needs? Society for Mining, Metallurgy, & Exploration Annual Conference & Expo, Minneapolis, MN. February 25–28.

Greer, B., A Nicholson, S. Helgen, and S. Kosinski. 2013. Incorporating wall rock runoff into pit lake water quality modeling in the arid western United States. International Mine Water Association Annual Meeting, Golden, CO.

Helgen, S.O., and A.N. Nicholson. 2007. The nexus of litigation, remediation, and good science in equitable allocation. American Bar Association 36th Annual Conference on Environmental Law. Keystone Resort and Conference Center, Keystone, CO. March 8–11.

Bowers, T.S., and A.D. Nicholson. 1996. Distinguishing the impacts of mining from natural background levels of metals [abstract]. Geological Society of America Abstracts with Programs 31(4):A-465.

Nicholson, A.D. 1996. Evaluating mercury speciation in contaminated soils: an integrated approach. EPA Special Mercury Speciation Workshop, Denver, CO. September.

Nicholson, A.D., and M.B. Goldhaber. 1992. Thermochemical sulfate reduction in the Whitney Canyon–Carter Creek Field, Wyoming: Core studies and geochemical modeling [abstract]. Geological Society of America Abstracts with Programs 23(6):A-153.

Kempton, H., W. Locke, D. Atkins, L. Bliss, A. Nicholson, and P. Maley. 1996. Predicting water quality in mine pit lakes: How far into the future to forecast? Geological Society of America Annual Meeting, Denver, CO. October 31.