CHARLES G. JOYCE, P.G.

Education

BS – Geology, Oklahoma State University - Stillwater, OK, 2001
AAS – Radiation Protection/Health Physics, Columbia Basin College, Pasco, WA, 1998

Professional Licenses

Professional Geologist – Nebraska (G-0330), Missouri (2005004570), Kansas (681), Illinois (196.00167)

Specialty Certifications

HAZWOPER Supervisor
Certified Groundwater Professional - Iowa
Licensed Driller – Arkansas, Missouri and Oklahoma
Licensed Remediation Consultant – Oklahoma
Well Drilling/ Pump Installation Contractor – Nebraska

Professional Affiliations

Executive Committee, State of Nebraska Geology Licensing Board
American Institute of Professional Geologists, Sustaining Member
Geologic Society of America, Fellow
Nebraska Geological Society, Member

Professional Experience

Chuck Joyce serves as the company's responsible charge Geologist for both Nebraska and Kansas. He currently serves as an executive on the Nebraska Board of Geologists and as a member of the Committee for Outreach and Uniform Procedures for the Associated State Boards of Geology (ASBOG). He also serves on ASBOG's Committee of Examiners as a Subject Matter Expert related to field investigation, drilling and well design.

Mr. Joyce has significant specialized experience in hydrogeological assessments, facility suitability determinations, environmental due diligence, petroleum cleanups and brownfield asset redevelopment. He is knowledgeable about environmental services related to real estate transactions in support of both acquisitions and sales of environmentally impacted sites, and he conducts site investigations and characterizations, including remediation and risk-based cleanups.

Mr. Joyce prepares health and safety plans for projects with elements related to toxic materials (PCBs), open excavations, confined space, and hazardous atmospheres commonly associated with petroleum and hazardous materials projects. His environmental consulting experience spans many technical fronts, focusing primarily on contaminant transport and groundwater cleanup. He is experienced in facility remediation from discovery through risk-based closure. His educational and professional background provides valuable insight into environmental facets associated with facility siting, due diligence, contaminant transport modeling, health and safety compliance, drilling, well installation, and groundwater remediation.

Demonstrable skills related to Mr. Joyce's project experience include:

- Prepared periodic monitoring and site characterization reports to regulatory agencies.
- Performed hydrogeologic bedrock assessments for preferential contaminant migration.
- Prepared periodic monitoring and site characterization reports as necessary to document fieldwork to regulatory agencies as required providing necessary documentation of cleanup efforts.
- Prepared health and safety plans to mitigate or reduce risks to project personnel.
- Logging environmental borings including field screening and abandonment.
- Design related to a variety of well types (e.g., monitoring, soil gas, piezometer, injection, extraction and disposal wells).
- Conducted pedalogical surveys along planned highway corridors to verify soil survey data.
- Provided detailed descriptions of soil texture and structure within soil horizons.
- Provided field oversight of subcontracted employees to ensure proper sampling and decontamination procedures were followed.
- Contaminant migration assessment, modeling, and remediation.
- Operated Geoprobe and hollow stem drilling rigs.
- Soil, groundwater and soil gas sampling procedures.
- Remediation system design and implementation.
- Trained project staff in safe operation of field equipment and sampling protocols.

Project Experience

Solid Waste

2013 Permit Renewal, City of Gering, Nebraska: Mr. Joyce provided project support by updating the population density calculations and current zoning information for the areas within a one mile radius of the operating Title 132 landfill. In addition, the landfill gas and groundwater sampling and analysis plans were updated which included relevant construction details and updates. Mr. Joyce also compiled well registration, construction and water usage details for groundwater wells in the vicinity.

Preliminary Site Assessment, City of Gering, Nebraska: In April 2014, the City of Gering was considering several alternatives to the currently proposed landfill site. Mr. Joyce supported the project delivery team by completing a preliminary bedrock structural analysis, estimated depth to groundwater, and a preliminary assessment of potential drawbacks associated with each of the sites that were being considered at that time. The city elected to suspend consideration prior to final site selection.

Methane Migration Mitigation, City of Gering, Nebraska: Several perimeter methane monitoring probes indicated non-compliant methane concentrations. Following regulatory notifications, Mr. Joyce prepared a remedial action plan to mitigate the methane concentrations to below the regulatory threshold. Following implementation, the methane concentrations in the wells showed immediate improvement and have steadily improved since implementation. Monthly monitoring has indicated compliant methane concentrations since November 2017. Provided continued compliant measurements are observed, the city should be able to return to a routine methane monitoring program in the coming months.

Methane Migration Mitigation, South Central Iowa Solid Waste Agency, Tracy, Iowa: Following identification of non-compliant methane concentrations in a perimeter gas probe. Mr. Joyce provided project oversight associated with development and implementation of a remedial action plan utilizing passive gas vents to mitigate methane migration. By utilizing a passive system, the facility realized cost savings compared to installation of an active system or significant costs associated with a gas

interception trench. Since implementation, compliant readings have consistently been reported to the Iowa Department of Natural Resources.

Monitoring Network Refinements, Alliance, Nebraska: Mr. Joyce has provided subcontractor bidding support, monitoring well installation oversight and updates to the current sampling and analysis plans for the currently operating municipal solid waste landfill and the historical landfill which is undergoing groundwater cleanup through Nebraska Title 118. Through coordination with adjacent landowners and municipal stakeholders the chlorinated solvent plume has been adequately characterized and prepared for active remediation to safeguard the high plains aquifer for future (and continued) use as a potable drinking water resource for residents in the vicinity.

Hydrologic Monitoring System Evaluation; South Central Iowa Solid Waste Agency, Tracy, Iowa: Reassessed the facility hydrologic monitoring system developed by the previous consultant to eliminate redundant monitoring locations. Based on Mr. Joyce's recommendations, the IDNR reduced the number of compliance well locations which reduced annual capital expenditures associated with groundwater sampling. By refining the sampling network to utilize the previous monitoring wells for groundwater elevation data the wells did not require immediate abandonment which further reduced ongoing and long-term capital expenditures.

Open Top Visual Waste Sort; Bluff Road Landfill, Lincoln, Nebraska: Visually assessed waste composition of material delivered to the Landfill in open topped containers (e.g., roll-off dumpsters, flat beds, dump trailers and open topped dump trucks. Waste was categorized into 5 primary categories further characterized into 32 subcategories in an effort to identify waste material and generators that may be candidates to divert waste from the landfill. In all 72 separate loads of waste were categorized. Results were summarized and presented to the landfill public outreach and recycling coordinator.

Lemon's Landfill, Poplar Bluff, Missouri: Provided field project oversight and quality assurance during expansion of the existing landfill gas system. Responsibilities included daily observation of the new methane extraction manifolds and lateral line installation. Ensured that project design specifications were adhered to and contractor followed appropriate safety protocols while performing hot work and trenching activities.

Butler County Landfill, David City, Nebraska: Developed hydro-geologic investigation to provide accurate engineering design and volume calculations for planned landfill expansion and major permit modification.

G&P Landfill, Milford, Nebraska: Performed semi-annual groundwater monitoring as required by Nebraska Title 132 Solid Waste Regulations. Mr. Joyce was responsible for well purging, sample collection and appropriate documentation. Following receipt of the analytical results, Charles provides geological support related to the groundwater monitoring report which is later submitted to the Nebraska Department of Environmental Quality (NDEQ).

Environmental Due Diligence

Topeka, Atchison & Santa Fe Railcar Repair Facility, Cleburne, Texas: Prepared a Phase 1 and Limited Phase 2 ESA for a railcar repair facility initially developed in the late 1800's. A total of seven areas of the 125-acre site were administratively closed with known contamination in place. An extensive regulatory records review identified areas of the site that required ongoing owner obligations that were required in order to maintain CERCLA landowner liability protection. Once the environmental disposition of the site was adequately assessed, purchase negotiations were able to proceed.

Environmental Site Assessment Peer Review, Multiple Sites, Kentucky: Reviewed nine Phase I ESAs in support of a refinancing portfolio for a retirement home investor on behalf of our client, a national bank. Very few deficiencies were noted in the original phase I ESA's. However, several of the older structures required implementation of operation and maintenance plans associated with lead based paint and asbestos containing material as required by the lender.

Former Grain Terminal, Omaha, Nebraska: Prepared a Phase 1 Environmental Site Assessment (Phase 1 ESA) for a former grain terminal located within the South Omaha Stockyards area. Due to the operational history of the facility, groundwater sampling was also completed utilizing temporary monitoring wells to evaluate shallow groundwater for the presence of grain fumigants which are commonly associated with historical grain storage facilities. Once contamination was ruled out and the disposition of the site was known purchase negotiations were able to proceed.

Jump Start Convenience Store, Winfield, Kansas: Following completion of the Phase 1 ESA which identified several recognized environmental conditions, a limited Phase 2 ESA was performed to further evaluate potential impacts to soil and groundwater at the site. Results of the additional investigation indicated that no further investigation was necessary and the transaction closed.

Proposed Condominium Complex, Saint Louis, Missouri: Following completion of Transaction Screen, several potential environmental conditions were identified; one of which was a former drycleaning facility. Rather than complete a Phase 1 ESA to re-identify the potential conditions, a limited Phase 2 ESA was performed, which identified chlorinated solvent contamination of the subject property.

Sinai Village I and Sinai Village II Developments, East Saint Louis, Illinois: Supported Phase I and Phase II ESAs associated with 30 closely concentrated commercial and residential lots in support of Illinois Environmental Protection Agency, Site Remediation Program. RECs were identified in connection with dry cleaning facilities, auto repair facilities and gasoline service stations which were located within the study area. Following characterization and remediation, a remedial action completion report was prepared and submitted for regulatory review.

Voluntary Cleanup and Brownfields

Standing Bair Lake Generating Station, Metropolitan Utilities District, Omaha, Nebraska: During site selection a former construction and demolition material landfill was overlooked within the footprint of a planned power generation campus. Since site control had never been maintained the stakeholders were concerned with elicit dumping that may have occurred during the operational lifetime of the landfill. Mr. Joyce helped develop the project scope to characterize, screen and monitor material as it was removed. As the project developed dynamic work planning was utilized to modify the originally developed scope in order to complete the project in a timely manner and to accommodate modifications due to previously undiscovered areas of fill within the project footprint.

Mixed Pesticide Soil Remediation, Kansas Department of Health and Human Services, Cimarron, Kansas: Following site characterization, related to a vehicular rollover accident which spilled approximately 1,500 gallons of various herbicides. Preliminary cleanup was completed by Kansas Department of Health and Human Services (KDHE). Confirmation samples indicated the presence of 2,4-D; Dicamba and Atrazine at concentrations above the applicable Tier 2 Risk-based standards for residential exposure. SCS collected confirmation samples and arranged to remove the soil. Excavated soil was loaded directly into plastic lined roll off containers and transported to the preapproved landfill under direction from KDHE. Confirmation sampling was completed by SCS and once adequate excavation margins were approved, the area was back filled using borrow dirt from a nearby source.

Quality Analytical Services, Omaha, Nebraska: The property was historically utilized as a petroleum bulk storage plant and later as a used oil recycling facility. The facility had been out of use for more than 20 years and had fallen into disrepair. Initially, the owner desired to have the above ground storage tanks removed so that they would not be an attractive nuisance to people in the area. After the tanks were removed, the property owner was motivated to transfer environmental liability and ownership of the facility. Mr. Joyce led the site characterization activities to assess the property. Following site characterization, the owner elected to complete remediation. SCS assisted with regulatory interface through the Nebraska Department of Environmental Quality Voluntary Cleanup Program and ultimately received no further action via voluntary remedial action with oversight from the Department of Environmental Quality's Petroleum Storage Tank program. Once the facility had achieved no further action status, the property was liquidated. Currently, the former facility has been incorporated into a larger tract to allow for redevelopment and reuse.

American Hydraulics/ Greenbrier Rail Services, Omaha, Nebraska: Mr. Joyce supported the project delivery team which characterized a former chrome plating facility. Following characterization, he also provided oversight and clean-up support during decommissioning and decontamination. Once cleanup objectives were achieved, Mr. Joyce prepared the Sampling and Analysis Plan and collected verification samples to demonstrate the facility had been adequately decontaminated prior to returning the leased facility to property owner.

Sooner Rose Theater, Midwest City, Oklahoma: A property developer was working with the city of Midwest City to redevelop a blighted section of town. Part of the project footprint was occupied by an abandoned retail gas station. The current owner, a trust, had inherited the property through succession and needed help navigating the regulatory framework associated with the orphan tank site. Mr. Joyce provided closure compliance oversight and subcontractor bidding assistance for the tank removal and subsequent closure. The developer was able to begin property redevelopment once the tanks were removed and the closure report submitted. Since the tanks were orphaned the developer or subsequent owner will have continuing obligations to allow the state or their subcontractor reasonable access if additional cleanup and characterization is required.

Petroleum Storage Tanks

US Postal Service, Falls City, Nebraska: Mr. Joyce served as the project manager and field geologist for a Tier 1 Site Investigation performed at a Post Office where a heating oil UST had previously been removed. The site had been on the State's backlog list since minor contamination was identified at the time of UST removal. A total of three monitoring wells were installed and soil and groundwater samples were collected from each for analysis. Data was used to complete a Tier 1 Risk Assessment prior to regulatory closure.

Sunoco Refinery, Tulsa, Oklahoma: Mr. Joyce completed the initial assessment of a solid waste management unit (SWMU) adjacent to the Arkansas River upstream from Tulsa, Oklahoma. Based on company records the SWMU had received non-regulated demolition debris, sludges, tank bottoms and burn pit residue from approximately 1949 to about 1961. Mr. Joyce completed an electromagnetic (EM) survey in order to determine which areas of the SWMU had adequate cover prior to planned regrading and riverbank stabilization. This data was used to estimate the amount of usable cover material that could be reused as part of the planned surface reconditioning.

Former Sinclair Service Station, Omaha, Nebraska: As the environmental project manager, Mr. Joyce oversaw the real estate transactional due diligence portion of the project. Once a purchase decision was made, he also oversaw removal and over excavation of the UST system, collected closure samples, and prepared the Closure Notification Report. Subsequent to closure completed a Risk Based

Corrective Action Tier 1 Assessment in order to evaluate real and hypothetical exposure pathways in an effort to obtain final closure. This assessment is currently under review by the NDEQ.

US Postal Service, Lincoln, Nebraska: Mr. Joyce provided UST removal permitting and direct oversight associated with closure by excavation of one 10,000-gallon gasoline UST and one non-regulated 560-gallon used oil UST. Tank decommissioning was completed in general conformance with the American Petroleum Institute (API) recommended practice 1604. Following closure sampling and notification reporting, the site was granted no further action status following regulatory review.

Former Geldbach Petroleum, Saint Louis, Missouri: As project manager, oversaw site characterization activities. Successfully assessed risks to the satisfaction of the Missouri Department of Natural Resources (MDNR). Coordinated groundwater monitoring program and additional UST removal. NFA status is expected following demonstration of plume stability.

Former Wolf's Service, Chesterfield, Missouri: Completed site closure following discovery of historical unregistered USTs at site. Following discovery of free phase gasoline at the site, permanent soil gas probes were utilized to evaluate potential vapor intrusion exposure to future receptors in order to achieve NFA status.

Truss Brothers Construction, Webster Groves, Missouri: Prepared work plans and conducted extensive site characterization work. Successfully evaluated potential risks to human health and the environment and ultimately achieved NFA status following execution of an activity use limitation.

Prairie Farms Dairy, Springfield, Illinois: Became project manager following six years of inactivity following UST removal and monitoring well installation. Following review of project files, Mr. Joyce discovered that eligible expenses in excess of $8,000 previously incurred had not been reimbursed from the Illinois Environmental Protection Agency due to improperly completed reimbursement applications. Corrected forms were submitted and the client received payment for both the historical work as well as the additional work performed in support of attaining NFA status for the site. No additional out of pocket expenses were incurred by the client following Mr. Joyce's involvement in the project.

Pop Shoppe, Tulsa, Oklahoma: Oversaw removal of two (2) 12,000-gallon gasoline and one (1) 8,000-gallon diesel USTs. Following collection of closure samples, effectively demonstrated that no further evaluation was required. Site was redeveloped immediately for non-fuel related retail activities.

Star Mart, Tulsa, Oklahoma: Oversaw removal of three (3) 10,000-gallon USTs. Field observations indicated that additional over-excavation was required to achieve clean-up goals. Approximately 60 cubic yards of hydrocarbon impacted soils were removed from the site and disposed of at a regulated landfill. Collected confirmation samples from excavation boundaries. Analytical results indicated concentrations below permissible limits.

Midco Concrete Company, Tulsa, Oklahoma: Oversaw removal of one (1) 18,000-gallon diesel UST and one (1) 6,000-gallon gasoline UST. Following collection of closure samples and documentation of site conditions, NFA status was granted.

EZ Stop, Haskell, Oklahoma: Oversaw removal of two (2)-10,000 gallon gasoline and one (1) 8,000-gallon diesel UST as part of facility upgrades. Closure and backfill samples indicated that an environmental release had likely occurred. Following closure activities, a suspicion of release monitoring well was installed. Based on analytical results, the Oklahoma Corporation Commission determined that the contamination was limited to the area immediately adjacent to the UST pit and issued a NFA letter.

Natural Resource Development

Sugar Camp Mine #1, Franklin County, Illinois: Evaluated existing geological and hydrological data in order to complete an empirical groundwater model addressing potential contaminant migration at the facility. The data used to prepare the model was based on site specific information obtained during previous investigations at the site and vicinity using client provided documentation relevant to the project. The model was included in the mining permit revision to satisfy regulatory requirements for the proposed coal refuse disposal impoundment.

Buckskin Special Waste Landfill, Fort Berthold Indian Reservation, North Dakota: Provided drilling oversight and initial project layout to obtain the geotechnical information required to design and construct the initial phase of a disposal facility for oilfield drill cuttings and closely aligned waste generated during exploration and development of the Bakken shale oil field. Project requirements included overall site layout, identification of buffer zones, potential disposal areas, existing topography, potential borrow and detention areas that could be utilized to minimize overall construction costs.

Deer Run Creek Mine, Hillsboro, Illinois: Prepared geologic cross sections utilized to prepare contaminant transport modeling during the initial siting characterization for a proposed coal refuse facility. Once the evaluation and computer contaminant transport model was completed, facility received regulatory approval to proceed with construction of the proposed facility. Several recommendations were incorporated into the original design to enhance public safety and reduce project completion costs.

Underground Injection Control and Sequestration

Prairie State Generating Company UIC #1, Washington County, Illinois: Served as the responsible charge Geologist related to well siting, construction, completion and pending operational permit. Prior to well siting well completion information for wells in the vicinity was reviewed in order to correlate anticipated stratigraphic relationships prior to permit to construction permit issuance. Oversaw drilling, well performance tests and final well completion. This facility's operating permit is currently under regulatory review.

Sugar Camp UIC #1, Akin, Illinois: The Illinois Environmental Protection Agency (IEPA) required that the mine water be managed as effluent waste instead of being managed under a general discharge permit. Due to high salinity and TDS pretreatment was not considered a cost effective alternative. As a result, SCS designed a Class I injection well to provide a cost effective disposal method. Mr. Joyce provided regulatory oversight and data review in order to complete the project. Upon completion, at a total depth of 12,733 feet below ground surface, the underground injection well became the first permitted Class I injection well in the State of Illinois. Based on the success of the first UIC well, a second well Sugar Camp UIC #2 was commissioned almost immediately. Both of the injection wells have performed as planned with design capacity.

White Oak Resources Dewatering Well #1, McLeansboro, Illinois: As part of the project delivery team related to assessing the feasibility of utilizing deep injection to dispose of native groundwater, Mr. Joyce reviewed and compiled historical oil and gas geologic well logs that were on file with the Illinois State Geological Survey. This information was utilized to determine the suitability of various subsurface units to receive water via deep well injection. The Knox Supergroup was identified to be the best candidate at this location to receive the non-hazardous wastewater injection. However, during step testing flow rates were considerably lower than expected. The well was then stimulated using acid injection and slick water fracturing to enhance the formation receiving capacity. After well stimulation, the injection well performed as initially expected.