## JOHN Rockhold, P.G.

### **Education**

Master of Science, Geology, University of Missouri -Columbia, 1987

Bachelor of Science, Geology, Northwest Missouri State University, 1983

### **Professional Licenses**

Registered Professional Geologist

Arkansas

Kansas

Missouri

### **Professional Experience**

Mr. Rockhold has more than 35 years of hydrogeology and environmental services experience and is currently a senior project manager in SCS’s Kansas City, office. He provides project management, which includes supervising a diverse team of environmental professionals made up of geologists, hydrogeologists, engineers, chemists and biologists. Duties include marketing, client contact, work scope development, proposal preparation, cost estimation, regulatory negotiations, work assignments, technical support and review as well as project management and review.

Mr. Rockhold’s technical responsibilities are primarily with geologic and hydrogeologic investigations, groundwater monitoring, remedial investigations, remedial design, and solid waste services. Duties include data acquisition and analysis; hydrogeologic modeling; soil and groundwater monitoring and site characterization; remedial design; and, landfill design and permitting, Representative projects include utility waste impoundments and landfill; Subtitle D landfill design and permitting, environmental site assessments and audits, hydrogeologic and geotechnical site investigations, remedial design and implementation, discharge permitting and complex hydrogeological evaluations.

### **Example project experience includes:**

#### Geology – Hydrogeology

**Detailed Hydrogeologic Site Characterization, Kansas City Power & Light, Weston, Missouri:**  Project manager and hydrogeologist responsible for the hydrogeologic and soils characterization for development and certification of a groundwater monitoring system for an approximately 160 acre impoundment located along the Missouri River. Following the site characterization an eleven well groundwater monitoring system was certified and a sampling and analysis plan (SAP) was developed, including development and certification of the statistical methods for data evaluation. Eight rounds of background samples were collected from each well to establish background water quality and statistical limits for future evaluation.

**Groundwater Monitoring, Kansas City Power & Light, Missouri and Kansas:** Project hydrogeologist responsible for semi-annual groundwater monitoring and reporting for ten coal combustion residuals (CCR) units (impoundments and landfills). Certifying geologist for the groundwater monitoring systems and statistical methods. Certifying geologist for the semi-annual and/or annual groundwater monitoring reports. Some of the groundwater monitoring and reporting projects has dated back over 10 years

**Site Characterization, Ames Municipal Electric System, Ames, Iowa:**  Project hydrogeologist responsible for the hydrogeologic and soils characterization for development and certification of a groundwater monitoring system for an approximately 10 acre impoundment located along the Skunk River. Following the site characterization an eight well groundwater monitoring system was certified and a sampling and analysis plan (SAP) was developed, including development and certification of the statistical methods for data evaluation. Eight rounds of background samples were collected from each well to establish background water quality and statistical limits for future evaluation.

**Hydrogeologic and Soils Characterization, Yellowstone Disposal Facility, Richland County, Montana:** Project manager and hydrogeologist responsible for the hydrogeologic and soils characterization of a greenfield landfill site in eastern Montana. A landfill siting study was performed on the 2,660-acre parcel in April 2014 to provide a general overview of the property and to provide initial site characterization data. This information was used to develop the preliminary conceptual design of the 650 acre solid waste facility and to develop the Hydrogeologic and Soils Characterization Work Plan. The characterization included over 60 borings ranging from 10 feet to 250 feet, 16 piezometers, slug testing, and geotechnical laboratory testing. The characterization report identified the uppermost aquifer beneath the site and recommended a groundwater monitoring network for the planned landfill.

**Hydrogeologic Evaluation, Cheyenne Sanitary Landfill; Cheyenne, Wyoming:** Project hydrogeologist responsible for comprehensive review and evaluation of existing site data and preparation of a concise summary hydrogeologic report and workplan. The data consisted of over 95 borings dating back to 1943 and ranging in depth from 6 feet to 245 feet. Seventy five of the borings had wells installed in them. The site is underlain by a complex hydrogeologic regime consisting of several perched aquifers, a principal unconfined aquifer and a confined aquifer. Recommendations and subsequent implementation included abandonment of over 10 improperly constructed or unnecessary monitoring wells, installation of over 12 additional monitoring wells, geophysical logging of 15 old and new monitoring wells.

**Hydrogeologic Investigation, Johnson County Landfill; Shawnee, Kansas:** Project manager/ hydrogeologist responsible to provide additional site hydrogeologic data and evaluate the feasibility of a downward vertical expansion over approximately 100 acres. The investigation was specifically designed to supplement data from previous investigations for the 600-acre plus landfill. Collection of additional data included over 400 feet of rock coring, installation of four four-well clusters, downhole HydroPhysicalTM and geophysical testing, packer testing and slug testing. The feasibility study evaluated the of potential groundwater inflow into the excavation from each of the surrounding stratigraphic units as well as through the underlying strata from the Kansas River. The evaluation underwent two independent peer reviews and concluded that a downward vertical expansion was feasible and could be designed, constructed and monitored in a manner that was protective of the public health and environment.

**Hydrogeologic Investigation, Fort Berthold Special Waste Landfill and North Dakota:** Project manager/hydrogeologist responsible for investigation of 160-acre property planned for development of a special waste landfill. Responsibilities include preparation of scope of work, drilling and soil testing, installing monitoring wells, evaluation of the ground water conditions, evaluation of borrow materials for use as bottom liner, drainage layer, and cap materials, and preparation of a report for submittal as part of the permit application.

Hydrologic Evaluation of Landfill Performance (HELP) Modeling; Kansas, Missouri, Colorado, Wyoming and Oklahoma: Project manager/hydrogeologist responsible for HELP modeling and leachate collection system design and/or final covers for over seven Subtitle D landfills located throughout the Midwest.

**Hydrologic Evaluation of Landfill, Coffey County Sanitary Landfill; Coffey County, Kansas:** Project manager responsible for a hydrogeologic investigation for the landfill area. The investigation included the development of a Kansas Department of Health and Environment (KDHE) appoved work plan, installation of groundwater monitoring wells and piezometers, soil and groundwater sample collection and analysis, and characterization of physical aquifer properties.

Hydrogeologic Characterization of Landfill Sites; Gascondade and Henry Counties, Missouri: Project Manager/Hydrogeologist for two hydrogeologic investigations that included coring of bedrock, installing monitoring wells, evaluation of the ground water conditions, evaluation of borrow materials for us as bottom liner and cap materials, and preparation of a report for submittal as part of the permit application.

**Hydrogeologic Characterization of Landfill Sites;** **Missouri and Kansas:** Project manager/ hydrogeologist for three hydrogeologic investigations, including coring of bedrock and installing monitoring wells. Also involved evaluating groundwater conditions and borrow materials for use as bottom liner and cap materials as well as preparing report for submittal as part of the permit application.

Geologic and Hydrogeologic Investigation; Perry, Kansas: Project Manager, responsible for site characterization relative to siting of a Subtitle D landfill on a 400-acre active rock quarry where services included coring of bedrock, installing monitoring wells, evaluation of the ground water conditions, evaluation of borrow materials for us as bottom liner and cap materials, and preparation of a report for submittal as part of the permit application.

**Dewatering Evaluation; Kansas City, Missouri:** Project hydrogeologist responsible for designing dewatering system for the installation of a rotary dumper system approximately 40 feet below groundwater at a large utility company. Utilized groundwater flow modeling to demonstrate a cut-off wall was more economic and practical as opposed to conventional dewatering by high-flow pumping (1000 to 2000 gallons per minute).

**Dewatering Evaluation, Kansas International Speedway; Kansas City, Kansas:** Project hydrogeologist responsible for characterizing groundwater flow and modeling dewatering scenarios. Subsurface investigation included 12 piezometer installations, aquifer testing and laboratory testing. Groundwater flow modeling of line slot trenches and trench simulation by pumping wells.

**Dewatering Evaluation, Blue Valley Waste Water Treatment Plan; Kansas City, Missouri:** Project hydrogeologist responsible for evaluating contractors proposed dewatering plan for temporary groundwater control during construction activities. The plan included 18 16-inch diameter deep wells in an alluvial aquifer with pumping rates between 1,100 and 1,500 gpm. Aquifer parameters and well designs were reviewed and several dewatering scenarios were modeled to simulate various construction and pumping sequences.

**Dewatering Evaluation, Leavenworth Lift Station; Omaha, Nebraska:** Project hydrogeologist responsible for evaluating contractors proposed dewatering plan for relieving hydrostatic pressure for a compaction grouting operation. Temporary groundwater control during construction activities. The plan included 18 16-inch diameter deep wells in an alluvial aquifer with pumping rates between 1,100 and 1,500 gpm. Aquifer parameters and well designs were reviewed and several dewatering scenarios were modeled to simulate various construction and pumping sequences.

**Dewatering Evaluation, Leavenworth Lift Station; Omaha, Nebraska.** Project hydrogeologist responsible for evaluating contractors proposed dewatering plan for relieving hydrostatic pressure for a compaction grouting operation to stabilize soft soils. The aquifer consists of saturated silts and clays underlain by well graded gravel. The plan included 2 12-inch diameter wells with pumping rates between 120 and 180 gpm. Aquifer parameters and well designs were reviewed and several dewatering scenarios were modeled to simulate potential drawdowns.

**Increased Groundwater Supply Capacity; Tonganoxie, Kansas:** Project manager responsible for all facets of project implementation, including evaluation of the feasibility and cost to expand groundwater supply to accommodate future growth. Project highlights included subsurface investigation with test borings, piezometers and test wells; aquifer testing (step drawdown and seven-day pump test) in addition to the evaluation of withdrawal alternatives including a 130-foot deep, 1000-foot long horizontal well.

**Groundwater Control, John O’Donnell Stadium Renovation; Davenport, Iowa:** Project hydrogoelogist responsible for hydrogeologic characterization of site adjacent to the Mississippi River for design of a flood protection and cutoff wall. Duties included the design, and evaluation of three test wells and nine piezometers using slug test, step drawdown test and pump test methodologies.

#### Remediation

**Nature and Extent Investigation, Exposure Evaluation and Assessment of Risk, and Assessment of Corrective Measures; Sibley Missouri:** Project manager responsible for implementing a nature and extent investigation to delineate metals impact at a coal combustion residuals (CCR) unit. The investigation including the installation and sampling of 16 additional groundwater monitoring wells and development of a Groundwater Conceptual Site Model (GwCSM). Based on the GwCSM an Exposure Conceptual Site Model (ExCSM) and Evaluation of Risk was developed to identify whether human populations or other organisms could come into contact with groundwater and/or surface water in the area of the CCR unit. The Exposure Evaluation and Assessment of Risk report was a companion document to the Assessment of Corrective Measures (ACM) to help direct the corrective measures alternatives and their applicability relative to current and anticipated future groundwater and surface water conditions. The completed ACM identified five corrective measures alternative for further evaluation.

**Nature and Extent and Assessment of Corrective Measures; Chanute, Kansas:** Project manager responsible for preparing and receiving regulatory approval for a Release Impact Plan (RIP) to investigate and delineate an existing leachate plume from a closed landfill. The RIP includes direct-push technology sampling and mobile analysis, including installation of over 15 monitoring wells. Following plume delineation and characterization, we developed a Corrective Action Implementation Plan (CAIP) for pilot testing a number of remedial technologies on the plume. Three different interim remedial actions were pilot studied at the site which included: large diameter permeable reactive barrier (RRB) wells backfilled with iron, sawdust, and compost; injection of HRC, sugar, molasses, and vegetable oil to create anaerobic reducing conditions; and cap repair, grading, and planting deep rooted native grasses and over 1,200 trees on a 4-acre test plot. Ongoing semi-annual groundwater monitoring is conducted at 18 groundwater wells and six seep locations at the facility. Groundwater concentrations are showing downward trends at this time.

**Voluntary Cleanup Program (VCP), Branson Landing Project; Branson, Missouri:** Project Manager responsible for addressing environmental concerns through the Missouri VCP. The City of Branson redeveloped 86 acres in Old Branson along Lake Taneycomo. The site consisted of campgrounds, a recreational vehicle park, several resorts, commercial structures and properties, boat docks and marinas, associated parking facilities, a city park, and residential structures.  Services provided included: Phase I Environmental Site Assessment (PH1 ESA); Limited Environmental Site Assessment; Cultural Resources Investigation; Jurisdictional Wetlands Delineation, NESHAP Asbestos Inspection, Project Design and Technical Specification; Asbestos Abatement Oversight and Air Monitoring; and Site Assessment/Characterization (SAC).

**Pipeline Compressor Station Impoundment Sampling and Closure, 16 Sites; Kansas, Missouri, Oklahoma and Texas:** Project Manager responsible for risk-evaluation services as part of decommissioning 16 multi-acre pipeline compressor stations where historical operations were responsible for releases of PCBs and polynuclear aromatic hydrocarbons (PAHs). Work was performed under a CERCLA consent order and required Sampling and Analysis Plan (SAP) and Quality Assurance and Program Plan (QAPP) development. The impoundment sampling made use of an extensive, but cost-effective statistical Geoprobe® sampling grid to isolate vertical and horizontal impact zones within the impoundments. The results were incorporated into the remedial action plan which precluded the need for confirmation sampling following remediation.

**U.S. Army Corps of Engineers Remedial Investigation; Hastings, Nebraska:** Site Manager, site geologist, and site safety officer throughout a multi-year investigation of a former Naval Ammunitions Depot where responsibilities included: work plan preparation, requisition and acquisition of field supplies, health and safety supplies, and equipment; air monitoring survey, surface geophysics of over 75 boring locations; supervising the drilling and installation of monitoring wells; team leader for soil and surface and groundwater sampling events; downhole geophysical logging; geotechnical testing; interpretation of boring logs, geotechnical tests, and geophysical logs for the on-site design of monitoring wells, and , final report preparation.

**Bioremediation; Kansas City, Missouri:** Project Manager, responsible for implementation of bioremediation of non-chlorinated transformer oil in gravel and on perched surface water around a high voltage transformer bank in the switchyard of a large utility company by in-situ microbial enhancement.

**Remedial Investigation, Design and Implementation; Leawood, Kansas and Kansas City, Missouri:** Project manager responsible for multi-faceted project involving contaminant migration across state, city and county boundaries and into a residential basement for which evacuation was necessary. Following evacuation, implementation of a remedial design was completed, including underground storage tank (UST) removal, cut-off trenches, groundwater removal and treatment (pump and treat), and soil vapor extraction.

**Naphtha UST Remedial Investigation and Design; Trenton, Missouri:** Project Manager responsible for soil and groundwater characterization followed by a state-approved bioremedial landfarm design that, following implementation, received site closure status for a national manufacturer.

**Remedial Investigation; Sugar Creek, Missouri:** Site geologist for an investigation of a former petroleum refinery containing RCRA and non-RCRA waste management facilities. Responsibilities included supervising conventional drilling and monitoring well installation, supervising drilling and sampling of soil and sludge using an amphibious drill rig, and team leader for a lead contamination soil sampling event.

**Superfund ERA Site; Waverly, Nebraska:** Rig geologist supervising drilling and installation of groundwater extraction monitoring wells and soil vapor extraction wells at a site contaminated with carbon tetrachloride.

**UST Remedial Investigation and Design; Kansas City, Missouri:** Project manager/hydrogeologist responsible for remedial investigation, impact evaluation as well as design and installation of a remedial system for a 24,000-gallon subsurface product release at a trucking facility.

**UST Site Characterizations; Kansas and Missouri:** Project Manager responsible for several hydrogeologic investigations and remedial designs related to leaking underground storage tanks for several major petroleum companies.

**RCRA Incinerator Closure;** **Nevada, Missouri:** Project hydrogeologist for site assessment, remediation and closure. Responsibilities included design and a groundwater containment system coupled with soil venting.

**RCRA Unit Closure; Southwest Missouri:** Site coordinator and site health and safety officer supervising drilling and installation of monitoring wells at an explosives manufacturer in Southwest Missouri.

#### Environmental

**Hazardous Waste Landfill; Wichita, Kansas:** Project manager responsible for preparation of RCRA Part A and Part B Permit renewal including development of groundwater protection standards, groundwater monitoring plan, and corrective action plan. Corrective action plan included design and implementation of phytoremediation and enhanced biodegradation consisting of planting approximately 800 trees (hybrid poplar, cottonwood, and willow) and injection of emulsified oil. Other responsibilities included: preparation of the annual reports, preparation of a site hydrogeologic model, and monitoring and extraction well repairs and installations.

**Environmental Quality Investigation; Kansas City, Missouri:** Project Manager, responsible for environmental quality investigation of ground water, soil, process water run-off, and equipment at a power station for a large utility company where contaminants included PCBs, asbestos, solvents, mercury, and petroleum hydrocarbons.

**Groundwater Monitoring of Landfill, Coffey County Sanitary Landfill; Coffey County, Kansas:** Project manager responsible for groundwater monitoring services including the development KDHE approved Sampling and Analysis Plan, collection of groundwater samples from wells within the monitoring network, statistical analysis of laboratory results, and the preparation of groundwater reports for inclusion in the landfill’s operating record.

**Environmental Quality Investigation; Kansas City, Missouri:** Project Manager, responsible for environmental quality investigation of ground water, soil, process water run-off, and equipment at a power station for a large utility company where contaminants included PCBs, asbestos, solvents, mercury, and petroleum hydrocarbons.

**Landfarm Manual; Kansas City, Missouri:** Team Member/Co-author, responsible for the physical design and specifications of a temporary biotreatment landfarm cell to be implemented and operated by the client to treat petroleum hydrocarbon contaminated soils generated at their facility.

#### Solid Waste

**Groundwater Monitoring and Reporting - Kansas City Power & Light, Missouri Facilities:** Project geologist for the groundwater sampling and reporting at the KCP&L Iatan, Montrose, and Sibley power generating stations and utility waste landfills.  Most recently, tasks have included strategic planning and monitoring and statistical analysis plan development to address the federal Final CCR Rule.

**CCR Surface Seep Investigation/Remedial Action, Tecumseh Energy Center:** Project Manager for a surface seep investigation and remedial action project at Westar Energy’s Tecumseh Energy Center near Topeka, Kansas. The project included the completion of an investigation to identify the source of surface seeps that were originating adjacent to and downgradient of the site’s CCR landfill. SCS completed and an initial “desk review” of available information to provide insight into potential causes of the seep and to define the subsurface conditions at the site. SCS completed an intrusive investigation program including boring and piezometer installation, surface water sampling, waste sampling/characterization, groundwater sampling, and ongoing surface and subsurface water elevation measurements to develop a hydrogeologic model of the area. Upon completion of the investigation, a hydrogeologic model was developed for the immediate vicinity of the landfill to identify groundwater flow pathways and the most likely source of the seeps. Laboratory testing indicated some correlation of the surface water and waste chemical makeups; thus potential impacts may be present. Mitigation options were developed for the site should it be determined that such actions be taken.

**Subtitle D Landfill Permit Modification; St. Joseph, Missouri:** Project Manager responsible for coordination and preparation of an application for a major permit modification to include an approximately 50 acre lateral expansion. The application included all of the elements of a new permit including, location restrictions, site layout, storm water modeling, composite liner design, leachate management, landfill gas management, regulatory negotiations, quality assurance/quality control (QA/QC) plan, closure and post-closure plans, and operations plan. A new draft permit has been approved and is anticipated to be finalized in July 2015.

**Subtitle D Landfill Design and Permitting; Great Bend, Kansas:** Project Manager responsible for all facets of project implementation including design, permitting, and construction. Project development included site layout, hydrogeologic and hydraulic modeling, composite liners design, leachate management design and modeling, regulatory negotiations, quality assurance/quality control (QA/QC) plan, closure and post-closure plans, operations plan and application preparation. Following regulatory approval the project included specification and bid package preparation and construction observation services. Additional projects have included:

* C&D Waste Disposal Area Permitting
* Mud Trap Waste Disposal Area Permitting
* Liquids Addition Permitting Under the RD&D Rule
* Groundwater Detection and Assessment Monitoring

**Subtitle D Landfill Design and Permitting; Burlington, Kansas:** Project Manager responsible for all facets of project implementation including design, permitting, and construction. Project development included site layout, hydrogeologic and hydraulic modeling, composite liners design, leachate management design and modeling, regulatory negotiations, quality assurance/quality control (QA/QC) plan, closure and post-closure plans, operations plan and application preparation. Following regulatory approval the project included specification and bid package preparation and construction observation services.

Subtitle D Landfill Regulations Compliance Assessments; Kansas: Project Manager for compliance assessments to evaluate the impact and associated costs of Subtitle D regulations for ten separate county landfills throughout eastern Kansas.

**Subtitle D Landfill Design, Permit and Construct; Chanute, Kansas:** Project manager responsible for all facets of project implementation including landfill siting; floodplain fill permitting; hydrogeologic site characterization; all aspects of landfill design; groundwater monitoring plan; sample and analysis plan; closure and post-closure care plans; regulatory negotiations for permitting; construction contract documents and specifications; construction oversight; QA/QC plan and implementation and construction documentation report.

**Subtitle D Landfill Design, Permit and Construct; Columbus, Kansas:** Project manager responsible for all facets of project implementation including hydrogeologic site characterization; geophysical survey of room and pillar coal mine; methane gas assessment; all aspects of landfill design; groundwater monitoring plan; sample and analysis plan; closure and post-closure care plans; regulatory negotiations for permitting; construction oversight; QA/QC plan and implementation and construction documentation report.

Landfill Release Impact Plan; Chanute, Kansas: Project manager for preparing and receiving regulatory approval for a Release Impact Plan (RIP) to investigate and delineate an existing leachate plume from a closed landfill. The RIP includes direct-push technology sampling and mobile analysis, including installation of over 15 monitoring wells.

**Engineered Containment System Design, North Trench Phase III, Cheyenne Sanitary Landfill; Cheyenne, Wyoming:** Project professional responsible for the design of an engineered containment system for a 13-acre cell. The design included evaluation of several bottom liner and leachate management system design options and proceeded with what was determined to be the most practical and cost-effective design option for the specific site. The design incorporated four barrier component profiles to account for differing slopes and foundation materials. The barrier components over native soil included the use of a geomembrane supported geosynthetic clay liner overlain by a leachate collection system that incorporated the use of a geosythetic drainage composite. Leachate drains by gravity to a sump and is removed through a side-wall riser.

Municipal Landfill Peer Review Program Training – Wyoming Department of Environmental Quality (WDEQ) and the Wyoming Solid Waste and Recycling Association (WSWRA): Project professional assisting in the development of training materials and conducted training sessions for landfill operators throughout the State of Wyoming for the WDEQ’s and WSWRA’s Municipal Landfill Peer Review program. The purpose of the program is to encourage and enable landfill operators to perform anonymous peer review inspections of similar landfill facilities to exchange ideas operator-to-operator and improve regulatory compliance without the commonly perceived intrusion of regulatory officials.

**Landfill Gas Collection and Control System - Casper Balefill, Casper, Wyoming:** Project Manager responsible for preparation of preliminary budget cost estimate for a landfill gas collection and control system for the City of Casper Balefill in Casper, Wyoming. This included an on-site review of the Casper Balefill; review of the facility’s permit application with the Wyoming Department of Environmental Quality; review of the facility’s Initial Design Capacity report and Tier I NMOC Emission Rate Estimation report; preparation of a conceptual gas collection and control system design for the facility; estimation of general quantities of gas collection and control system components; and collection of budget cost information from various equipment suppliers.. Based on the results of the evaluation, the facility decided to move forward with the Tier 2 testing and analysis in lieu of installing a gas collection and control system.

**NMOC Tier 2 Testing, Casper Balefill, Casper, Wyoming:** Project Manager responsible for NMOC Tier 2 Testing of the Casper Balefill in 2005 and 2010. This include preparation and WDEW approval of a NMOC Tier 2 Testing Work Plan followed by field implementation. The 2005 field implementation included collection of landfill gas samples from 50 probes advanced into the waste. Additionally, samples were collected for analysis for an evaluation of potential impacts to groundwater by landfill gas. The results were used to adequately characterize the volatile organic compounds (VOCs) contained in the landfill gas at various depths within the waste, theoretically model possible VOC concentrations in groundwater using Henry’s Law and to demonstrate to WDEQ whether a potential exists or does not exist for landfill gas to impact groundwater. The 2010 field implementation included collection of landfill gas samples from 50 passive gas vents. Reports were prepared following both Tier 2 evaluations.

**Lee’s Summit Resource Recovery Park, Lee's Summit, Missouri:** Project Geologist responsible for landfill gas and contaminant migration assessment. Following landfill gas and groundwater plume delineation, an active off-waste gas and groundwater extraction trench was designed and installed to effectively limit gas migration and groundwater impact at the facility’s boundary. Overall, a 1,700-liner foot was installed to depths varying from 10 to 40 feet below the ground surface. The trench extracts both gas and groundwater. The collected groundwater is pumped into the facility’s leachate force main and the gas is flared separate from the landfill’s in-waste active gas collection and control system.

**Maryville Sanitary Landfill, Maryville, Missouri:** Project Manager responsible for preparing a Landfill Gas (LFG) Corrective Action Plan including delineation of the extent of LFG migration in response to methane measurements above compliance levels in LFG monitoring probes at the facility boundaries. The LFG delineation and Corrective Action Plan included soil gas sampling on a grid around the impacted monitoring probes utilizing direct-push technology. Services included negotiations with the Missouri Department of Natural Resources on behalf of the City of Maryville to demonstrate that the LFG migration did not pose an environmental or safety threat based on the extent of migration.

**Barton County Sanitary Landfill, Great Bend, Kansas:**  Project Manager responsible for performing a landfill gas (LFG) migration assessment. The assessment included the collection of over 40 soil gas samples using direct-push technology and on-site analysis. The on-site analysis was performed utilizing a van-mounted laboratory grade gas chromatograph. Following the assessment a LFG monitoring network was designed and installed.

#### Collection, Transfer Station, and Recycling Facilities

**Deffenbaugh Solid Waste Processing Facility, Topeka, Kansas:** Project Manager responsible for permitting and design services for a 250 to 500 ton per day solid waste transfer/recycling facility. Services included preparing the conditional use permit application for this facility, including negotiations on various issues with City staff and the state department of transportation. Required working closely with the project’s owner to develop the permitting strategy beginning with site selection and ending with the issuance of a conditional use permit. Upon receiving the conditional use permit from the City, the required solid waste transfer station permit application including engineering design report and operations plan was immediately submitted the State and subsequently approved within . Other features of the permitting process included inter-agency coordination with the regional solid waste management planning commission and other county, state, and federal agencies. In addition to permitting, a detailed design, bid specifications, and bidding assistance were provided.

**Blue Summit Solid Waste Processing Facility, Blue Summit, Missouri:**  Project Manager responsible for preparation of a Conditional Use Permit application and Solid Waste Processing Facility Construction Permit application. The proposed facility was a 500 to 700 tons per day MSW, C&D and comingled recyclables transfer station. The facility did not receive a Conditional Use Permit. However, services provided included the following:

* Site layout and design of an approximately 11,600 square foot metal building
* Storm water design and evaluation
* Traffic study and evaluation report
* Engineering design report
* Operations Plan

**EnviroStar Resource Center, Grain Valley, Missouri:**  Project Manager responsible for preparation of a Conditional Use Permit application and Solid Waste Processing Facility Construction Permit application. The proposed facility was a 30 tons per day MSW and comingled recyclables transfer station. The facility did not receive a Conditional Use Permit from the local jurisdiction; however, services provided included the following:

* Site layout and design of an approximately 7,600 square foot metal building
* Storm water design and evaluation
* Engineering design report
* Operations Plan