

KIM ARNOLD, P.G.
Hydrogeologist



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Years Experience
15 years

Education/Training
M.S. Environmental
Engineering Sciences,
University of Florida
(2014)

M.S. Earth & Ocean Sciences
Duke University (2002),

B.S. Environmental Geology &
Anthropology with Honors,
Summa Cum Laude,
Phi Beta Kappa,
Southern Methodist University
(1999)

MODFLOW Numerical
Modeling Training

ARCGIS I & II Training

Mike-She Training

Analytical Element Modeling
Training (SLAEM/MLAEM)

Licensing & Registration

Florida Professional Geologist,
License No. PG2565

Professional Affiliations

American Institute of
Professional Geologists
(AIPG)/Florida Association of
Professional Geologists
(FAPG)

National Groundwater
Association (NGWA)

Kim joined Johnson Engineering in 2005 and is a hydrogeologist in the company's water resources group. She is responsible for performing groundwater modeling, hydrogeologic investigations, water resource assessments, aquifer performance testing, hydrologic monitoring program development, and water management district water use and Florida Department of Environmental Protection (FDEP) permitting. Additionally, Kim has worked on Public Service Commission (PSC) utility certification cases, comprehensive plan amendment applications and Development of Regional Impact (DRI) applications for large-scale developments. She is familiar with the hydrogeology of Southwest Florida and regulatory requirements. Kim joined Johnson Engineering with 2.5 years of previous experience as a hydrogeologist with the SFWMD, where she reviewed over 500 water use permit applications.

Relevant Experience

- Lee County Utilities SFWMD Water Use Permit Renewal - Hydrogeologist for Public Water Supply water use permit renewal for Lee County Utilities seeking a 20-year duration and 40 MGD allocation. Project required significant data analyses associated with pumpage, monitor well data, and ecological assessments. Tasks performed in support of the permit renewal included analyses of changes in watershed boundaries and land uses from 1944 to 2008, groundwater modeling, development of mitigation plans and assessments to evaluate impacts due to shallow aquifer withdrawals, and formulation of a wellfield operating plan to meet demands and minimize drawdown impacts.
- Bonita Springs Utilities Wellfield Protection Ordinance Model - Project manager for groundwater flow and transport modeling to aid in establishment of protection zones for public supply wellfields. Effort included verifying suitability of Lee County's 13-layer calibrated MODFLOW model for use in study area and modifying it to reflect current and proposed wellfield operations. MODPATH models for municipal wellfields were developed from the sub-regional MODFLOW model and used to establish wellfield capture zones based on travel times within an aquifer. Model verification included comparing model water budgets for the Bonita Springs area with measured data and comparing model groundwater flow gradients with gradients calculated from USGS monitor well data.
- Lee County Port Authority Hydrogeological Review/Analysis of Mining Excavation – Support for team of expert witnesses for a Lee County re-zoning request to develop a mine immediately down-gradient of the LCPA's mitigation park due to concerns the mine would adversely affect wetland hydroperiods in the mitigation park and impact the success requirements. Analyzed water level and rainfall data to determine a water budget for the proposed mine site. Reviewed data sets, monitoring plans and groundwater modeling files and prepared technical documents summarizing findings. Performed independent modeling analysis of how construction of the proposed mine and grout curtain surrounding the mine lake would influence both long-term and short-term water table levels at the mine site and mitigation park property. Zoning hearing testimony included preparation of presentation materials designed to explain highly technical concepts and findings related to groundwater flow hydraulics and groundwater-surface water-wetland hydrology.
- Sarasota County Wet Detention Pond Discharge Study – Investigated long-term discharge behavior of 25 wet detention ponds in Sarasota County. Due to observed variability, formulated a groundwater interaction component to assess the influence of groundwater-surface water interactions on discharge behavior. Included review of surface water and groundwater levels, influence of boundary conditions (i.e. streams), and hydraulic properties of Surficial Aquifer countywide. Results indicated groundwater flow, irrigation practices and boundary conditions may significantly influence discharge behavior.
- Town and Country Utilities FDEP Groundwater Monitoring Plan – Project manager for preparation of a groundwater monitoring plan and associated monitor well installation meeting FDEP criteria related to operation of a new reclaimed water system near environmentally sensitive lands. Using the first phase of development as a model groundwater monitoring site, evaluated the hydrogeology of the water table aquifer, performed a site review, sited six monitoring wells, and prepared an associated groundwater monitoring plan and engineering report. The groundwater monitoring plan and engineering report included a mounding analysis for the site, an evaluation of water quality due to application of reclaimed water, and a water balance for the system.
- Picayune Strand/Fakahatchee Estuary Water Reservation Stakeholder Input - Participated

in a stakeholders group as part of the SFWMD's Picayune Strand reservation rulemaking process, offering input regarding technical, scientific and practical considerations during rule development to examine the interactions between regulated users of the resource and the hydrological restoration of the ecosystem. Reviewed and offered public comment on technical documents prepared by agency, including integrated surface water-groundwater modeling.

- FDEP Long Term Discharge Study - Investigated long-term discharge behavior of typical wet detention ponds in southwest Florida. Due to observed discharge variability, formulated a groundwater interaction component to assess how groundwater-surface water interactions may influence discharge behavior. Included establishment of groundwater monitoring networks, multi-day, constant rate aquifer performance tests, and development of wet and dry season flow nets. Information was used to construct water budgets to determine relative contributions to discharge. Presented results at summer 2014 FSA conference.
- Babcock Ranch DRI and Re-Zoning Applications – Prepared water resources portions of application for a Development of Regional Impact (DRI) for ~13,600-acre new community project. Reviewed publicly available data and data collected on-site to develop pre- and post-construction steady state water budgets for site. Created groundwater models to evaluate the effects of withdrawals to meet potable and irrigation demands. Worked with ecologists and surface water engineers to address questions regarding hydrologic impacts to extensive wetland systems on-site. Prepared water resources portions of Lee County Comprehensive Plan amendment and re-zoning application for ~4,150-acre portion of development in Lee County. Performed flow net analysis to evaluate localized changes in water budget and recharge due to changes in hydrogeological characteristics across steeply sloped portion of the site. Findings demonstrated site did not meet criteria established by Lee County for inclusion in the Density Reduction/Groundwater Resource (DR/GR) land use category. Provided expert witness testimony in public hearings.
- Carlton Ranch Water Quality Monitoring - Developed SWFWMD-approved monitoring plan to assess both quantity and quality of surface water and groundwater flow for 5,820-acre project site in DeSoto County in order to evaluate impacts to Prairie and Joshua Creeks watersheds. Water quality monitoring focused on salinity and nutrient loading as related to rainfall and irrigation practices. Total loading was calculated using the control structure geometry, stage data and parameter concentrations. Water level and quality were also measured in piezometers throughout the site and irrigation wells.
- Town and County Utility Hydrogeological Investigation at Babcock Ranch - Conducted a hydrogeological investigation of the Sandstone aquifer, which included design, testing, construction observation, and construction administration of a Sandstone aquifer test production well, three Sandstone aquifer monitor wells and two Surficial aquifer monitor wells. Testing included step drawdown test, three-day constant rate pumping and recovery tests, along with water quality analyses. Data collected was analyzed and used to design and permit a Sandstone aquifer public water supply wellfield through the South Florida Water Management District. In 2015, assisted TCU with another modification of the SFWMD PWS permit to relocate two proposed Sandstone aquifer production wells up-gradient of a plume of saline water discovered in the Sandstone aquifer. Performed analyses to determine optimal locations for the production wells that would both minimize the potential for plume migration and minimize construction costs. Project manager for construction of two 12-inch diameter production wells and performed step drawdown testing and water quality analyses on the wells. Water quality at both wells is fresh and combined anticipated yield should exceed 1.5 MGD.
- Ave Maria Hydrogeological Investigations - Evaluated the community's existing Lower Tamiami public water supply wellfield by conducting a 72-hour aquifer performance test while the allowing the wellfield to remain operational. Johnson Engineering assisted in acidization of irrigation wells, irrigation well rehabilitation, and provided a shallow aquifer hydrogeologic mapping and water level assessment for a groundwater flow model. Services for Ave Maria also included hydrogeological investigations of the Intermediate Aquifer System as alternative water supply option. This effort involved test well design and construction, aquifer performance testing and water quality analysis. Prepared multiple modifications and renewals for agricultural irrigation, landscape irrigation, public water supply and dewatering permits for the site, with associated groundwater modeling. Potential impacts to wetlands evaluated as high regulatory priority due to proximity to Camp Keais Strand.