

Kris Khilnani, PE, GE

President and Principal



Education

- M.S., Soil Mechanics/Foundation Engineering, Indian Institute of Science, 1963
- B.Sc., Civil Engineering, Nagpur University, 1962

Registration and Certification

- Geotechnical Engineer, California, 1993, #2203
- Professional Civil Engineer, California, 1985, #39661
- 40-Hour OSHA Trained, 29 CFR 1910.120(e)(2)/8 CCR 5192

Experience

45+ years

With AES

18 years (Started Firm)

Professional Activities

- Member, American Society of Civil Engineers
- Member, International Society of Soil Mechanics and Foundation Engineering

Mr. Kris Khilnani has 45 years of multidiscipline engineering experience in investigations, siting, design, and construction quality assurance (CQA) monitoring for landfill and waste disposal facilities, mass earthwork for large land development projects, earth and rockfill dams, highways and transportation corridors, and heavy industrial structures. He has provided project management and technical review of over 80 landfill expansion and closure projects in southern California with a diverse scope of services including geotechnical characterization, design, CQA services for earthwork and geosynthetics and providing construction management services. His responsibilities have included providing technical oversight; directing and guiding project and technical staff; maintaining client communication on project performance, schedules and budgets; and preparing and reviewing project technical documents. He has routinely interfaced with regulatory agencies including Regional Water Quality Control Board (RWQCB), California Integrated Waste Management Board (CIWMB), Local Enforcement Agencies (LEA), and California Department of Water Resources (DWR) and he is intimately familiar with the State and Federal Regulations for landfills including CCR Title 27 and Code of Federal Regulations, Title 40 Subtitle D.

His project experience includes:

LANDFILL PROJECTS

- **55th Way Landfill, City of Long Beach, California**
Technical Reviewer for CQA services during construction of the GCL final cover system at the 55th way Landfill in the city of Long Beach. The final cover system for the 5.5 acre landfill that was converted into a park included a GCL layer, a geocomposite drainage layer and two-foot thick soil cover.
- **Apple Valley Sanitary Landfill, San Bernardino County, California**
Task Manager during the preparation of closure construction documents and providing construction management for the final closure construction. Provided technical review of Specifications, CQA Plan, Engineers Estimate, and design report for the submittal package. The project work tasks included geotechnical investigation and testing of onsite borrow material and import sources for blending scenarios to attain cover permeability, final cover grading, drainage design and design of miscellaneous closure improvements, preparation of contract drawings and technical specifications.
- **Badlands Landfill, Riverside County, California**
Project Manager for alternative liner design for Canyon 4, Phase 2 liner and preparation of application package for RWQCB approval.

Project Manager for CQA services for composite liner for the 22-acre Canyon 4, Phase 2 expansion, including 2 million cu. yds. of rock excavation, and 2.5 million sq. ft. of geosynthetics, including 80-mil HDPE, GCL and geotextile.

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Project Manager for slope stability analysis and CQA services for Subtitle D composite liner for a 32-acre cell for Canyon 3, Phase 1 expansion, including 5.7 million cu. yds. of rock excavation, 20,000 cu. yds. of clay liner, and 5 million sq. ft. of geosynthetics, including 40-mil, 60-mil & 80-mil HDPE, GCL and geotextile.

Technical Reviewer for CQA monitoring program for the Canyons 1 and 2 expansions. Construction included earthwork, clay liner and LCRS placement covering a 10-acre expansion area. The CQA program was in conformance with the regulatory requirements established by the Santa Ana RWQCB.

- **Calabasas Landfill, Los Angeles County, California**

Project Manager for geologic assessment and geotechnical evaluation of Southeastern Cut expansion. Responsible for technical oversight of drilling, geotechnical laboratory testing, material properties evaluation, seismic deformation, stability analysis of refuse slopes and liner interface testing. Coordinated preparation of responses to regulatory agencies comments on geotechnical report.

Project Manager for hydrogeologic investigation for EMP and CAP including installation of monitoring wells and piezometers, and pump testing for groundwater evaluation monitoring program.

Project Manager for hydrogeologic investigation, installation of monitoring wells and piezometers, and aquifer testing to evaluate aquifer properties and aquifer stress testing for low flow purging for sampling of groundwater monitoring wells. The results were analyzed to evaluate effectiveness of existing subsurface barriers.

Technical Reviewer during earthwork and clay liner construction for D-Cut including evaluation of suitability of borrow material and evaluation of blending procedures to obtain clay liner meeting the specified permeability requirements.

- **Coyote Canyon Landfill, Orange County, California**

Project Manager for post-closure monitoring and CQA during reconstruction of the final cover. Also responsible for revising the post-closure plan on the basis of cover performance and results of moisture monitoring.

- **Double Butte Landfill, Riverside County, California**

Technical Reviewer for preparing closure and post-closure maintenance plan for the 100-acre landfill, including preparation of construction plans, technical specifications, QA/QC plans, and cost estimates for construction of landfill cover and drainage system.

- **Edom Hill Landfill, Riverside County, California**

Technical Reviewer during a preliminary geotechnical investigation to evaluate the suitability of a proposed transfer station site located in close proximity of the south branch of the San Andreas fault.

- **Frank R. Bowerman Landfill, Orange County, California**

Technical Reviewer for the design and preparation of construction plans and specifications for the 5.8 million cu. yd. Landslide Backcut Excavation project including grading plans, surface drainage and stockpile plans and horizontal drains.

Technical Reviewer for geotechnical and QA/QC services for 40-acre Phase VIIA and VIIB expansions involving over 6 million cu. yds. of excavation, landslides evaluation and mitigation, and QA/QC for composite liner construction involving over 100,000

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cu. yds. of low-permeability soil liner, 7 million sq. ft. of geosynthetics, and 50,000 cu. yds. of LCRS sand. Scope also included technical review of LCRS gravel crushing operations and quality evaluation.

Task Manager for borrow source evaluation and test pad construction using alternative clay liner sources.

Technical Reviewer for site characterization studies and design of groundwater protection measures to meet Subtitle D and Chapter 15 requirements for landfills. Investigation included detailed geologic mapping, exploratory trenching, drilling, field and laboratory permeability testing for liner design, leachate generation estimates, and design of an LCRS.

Project Director for Phase I construction management and design of landfill including design of composite liner, and (LCRS), and (CQA) services for clay and synthetic liners. Prepared QA plans for liner system and developed field procedures for placement and testing of clay lining for a 20-acre area. Provided conceptual design of flexible membrane liner (FML) and LCRS, which involved 1.5 million sq. ft. of 80-mil smooth and double-sided textured geomembrane.

Technical Reviewer for geotechnical services for an 18-acre Phase II expansion, including review of all major submittals to the Integrated Waste Management Department (IWMD) and Regional Water Quality Control Board (RWQCB). Interfaced with IWMD, design engineers, and regulatory agencies on design and CQA for the installation of the clay and synthetic lining system and LCRS reconstruction. The clay lining and the FML covering 1.4 million sq. ft., consisting of 80-mil, double-sided textured high density polyethylene (HDPE).

Technical Reviewer for Phase IV landfill development, including technical direction and QA monitoring for processing of 180,000 cu yds of clay liner material; establishing grading design for onsite clay borrow areas; developing a CQA plan for testing of clay quality and for construction and testing of a clay liner test pad fill; and providing CQA services for composite liner construction.

- **Gardena Valley No. 5 Landfill, Carson, California**

Project Director and *Technical Reviewer* environmental investigations and landfill gas control design, and prepared a post-closure land use plan for a 10-acre landfill property that was closed in 1988. The landfill that is currently paved is planned to be used as a parking lot for an adjacent commercial/industrial development. The landfill has an active landfill gas collection system consisting of extraction wells, headers, laterals and a flare station. An air dike system surrounding the landfill further protects the adjacent development from potential methane migration from the landfill.

- **Lamb Canyon Landfill, Riverside County, California**

Project Manager for design and CQA for Phase 2, Stage 3 expansion involving seismic site response analyses, stability and seismic deformation analyses of refuse fill slopes, and evaluation of alternative LCRS design for proposed liner system. CQA services included 1.5 million cu. yds. of excavation, 400,000 cu. yds. of engineered fill, 5.4 million sq. ft. of geosynthetics, 25,000 cu. yds. of low-permeability liner and LCRS. Also responsible for alternative LCRS study for design of 9-inch thick gravel layer.

Project Manager for the Phase 2, Stage 1 composite liner including testing for earthworks and geosynthetics. Performed QA/QC services for approximately 4,000 cu. yds. of low-permeability subgrade layer, earthworks and 900,000 sq. ft. of geosynthetics.

Technical Reviewer for geotechnical investigation for Phase 2 expansion including fault investigation, subsurface exploration, geotechnical data analysis, and slope stability evaluation.

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- **Lenwood-Hinkley Sanitary Landfill, San Bernardino County, California**

Project Manager for the CM and CQA services for the ongoing final closure construction project involving final cover construction on 50 acres of landfill footprint. The project features screening of stockpiled final cover materials, final cover demonstration fill, excavation of final cover from onsite borrow areas, construction of drainage structures, installation of six perimeter LFG probes and ten LFG vents, and erosion control measures.

- **Mesquite Regional Landfill, Imperial County, California**

CQA Manager for 7-acre Cell 1 composite liner involving observation and testing of earthworks, LCRS gravel and geosynthetics. Extensive CQA testing of 15,000 cu. yds. of LCRS gravel gradation during screening and gradation and hydraulic conductivity testing during placement. Prepared as-built CQA report for Phase 1 liner and secured RWQCB approval within 5 days.

Technical Reviewer and Coauthor during preparation of Technical Design Report (TDR) for Composite Liner Cell 1 for submittal to regulatory agencies, including review of WDRs, alternative liner design and design calculations for alternative LCRS.

Technical Reviewer during study evaluating alternative final cover systems for the side slopes and top deck of the landfill.

Technical Reviewer for geotechnical characterization studies for master plan and phasing plan for 2,300-acre rail haul landfill, including construction materials investigations, landfill foundation, alternative liner design concepts, and preparation of detailed technical reports of geotechnical findings.

Technical Reviewer during investigations to evaluate crushed aggregate products derived from onsite alluvial sources, evaluate quality and volume of in situ and stockpiled basalt for railroad ballast, evaluate soil cement mix design for erosion protection of planned drainage channels, evaluate the depth to competent material for a cutoff wall to be constructed across a natural drainage channel.

- **Mid-Valley Sanitary Landfill, San Bernardino County, California**

Project Manager for the Unit 3, Phase 5A composite liner construction involving 25,000 cu. yds. of clay liner and 1,200,000 sq. ft. of geosynthetics.

- **Milliken Sanitary Landfill, San Bernardino County, California**

Technical Reviewer for construction management during closure of 75-acre final landfill cell, including CQA for LFG modifications. Responsibilities included review of gravel quality for LFG extraction wells.

- **Operating Industries Inc. (OII) Landfill, Monterey Park, California**

Technical Reviewer for the design and CQA services for moncover for the closure of the 145-acre hazardous waste landfill involving 1.5 million cu. yds. of earthwork, 1.9 million sq. ft. of GCL for top deck final cover.

- **Prima Deshecha Landfill, Orange County, California**

Technical Reviewer for geotechnical investigations and stability analyses, and clay borrow source evaluation for Master Plan Development and Zone 1 design. Geotechnical investigations included detailed geologic mapping, exploratory trenching, drilling, laboratory testing, slope stability analyses including evaluation of landslides and design of cut slopes, and evaluation of clay borrow sources.

- **Puente Hills Landfill, Los Angeles County, California**

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Technical Reviewer for geologic observation and QA/QC services for Lower Western Cut involving 2.0 million cu. yds. of excavation with cut slopes up to 290 feet high. Also coordinated and interpreted results of liner interface testing for different configurations of liner and slip layers for proposed Phase 5 expansion.

Project Manager and Technical Reviewer for the geotechnical investigation of the 215,00 sq. ft. Puente Hills MRF. Assessed liquefaction hazard and provided design recommendations for both deep and shallow foundations.

Project Manager for composite liner construction for a 34-acre cell for Phase 4 Upper Slopes involving over 7 million sq. ft. of geosynthetics, including 40-mil HDPE, 80-mil HDPE, GCL, geotextile, geonet, geocomposite and 12-mil protective membrane. Responsible for overall technical direction of CQA activities and coordination with the Owner's Contract Administration, Design Group and Contractor.

Project Manager for composite liner construction for a 43-acre cell for Phase 4 Expansion involving over 9.5 million sq. ft. of geosynthetics, including 40-mil HDPE, 80-mil HDPE, GCL, geotextile, geonet and geocomposite. Responsible for overall technical direction of CQA activities and coordination with the Owner's Contract Administration Design Group and Contractor.

Project Manager for CQA services during composite liner construction for Phase 2 expansion including 4.7 million sq. ft. of geosynthetics and 45,000 cu yds of clay liner. The composite liner included 2-foot thick compacted clay and textured HDPE on the canyon floor, and Geosynthetics Clay Liner (GCL) and single side textured HDPE on side slopes.

Project Manager for slope stability analysis and CQA for reinforced earth wall construction to stabilize slope below PERG facility. The project involved geologic mapping of backcut and CQA during construction of stabilization fill.

Geotechnical Task Manager for Phases 2 and 3-5 geotechnical design and hydrogeologic investigation. The program included drilling and logging of boreholes, installation of monitoring wells, performing aquifer tests, evaluating slope stability for cut slope design including analyses for stabilization by tie back anchors and evaluating by dewatering to increase factors of safety.

Technical Reviewer for final cover evaluation encompassing 180 acres of landfill face. The study included 110 BATTM tests to determine the in-situ permeability of the cover soils and analysis of 48 samples for laboratory permeability and other soil parameters.

- **San Timoteo Landfill, San Bernardino County, California**

Task Manager for geotechnical investigation, alternative liner design, and test pad construction, and evaluation for Phase 2 and 3 expansions.

Technical Reviewer during CM/CQA services for Unit 2, Phase 3 expansion involving 6,000 cu. yds. of clay liner, 400,000 cu. yds. of engineered fill and over 1.5 million sq. ft. of geosynthetics installation including HDPE geomembrane, GCL, geotextile and protective membrane.

- **Santiago Canyon Landfill, Orange County, California**

Project Director for the construction management and engineering support services for final closure construction. The closure involved construction of 5-foot thick moncover for this 130-acre landfill including 100 acres of side slopes and 30 acres of top deck. The closure included placement of about 900,000 cu. yds. of material including about 600,000 cu. yds. of import from FRB

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- **Spadra Landfill, Los Angeles County, California**

Technical Reviewer for geotechnical investigation at the Spadra Landfill to determine whether the as-built final cover meets the requirements of CCR. The investigation included drilling 63 hand auger borings, performing BATTM permeability tests and laboratory permeability and hydraulic properties tests to evaluate infiltration through as-built final cover.

- **West Riverside Landfill, Riverside County, California**

Technical Reviewer for preparation of closure plan for 40-acre West Riverside Municipal Landfill. Work tasks included preparing landfill cover and surface drainage design, construction specifications, QA/QC plan, and a closure and post-closure maintenance plan. Also provided technical review of CQA services during construction of final cover including 200,000 cu yds of clay liner.

OTHER WASTE MANAGEMENT PROJECTS

- **Inland Empire Regional Composting Facility, Rancho Cucamonga, California**

CQA Manager for observation and testing of biofilter media replacement for 12 biofilter cells totaling 46,000 cu. yds. of wood chips. The testing included media chemical analysis, size distribution, air voids capacity and moisture content. Also prepared as-built CQA report of observations and testing.

- **Westlake Farms Composting Facility, Kettleman City, California**

Project Manager supervising construction and CQA testing for clay liner test pads and lime and lime-cement stabilized pads for wastewater ponds, Contractor's equipment pads, access roads and preconsolidation pad for installation of wick drains. The CQA testing included routine compaction tests, in situ hydraulic conductivity tests using Boutwell Method and laboratory hydraulic conductivity tests by flexible wall permeameter.

Project Manager for soil stabilization CQA including lime treated soil (LTS) and soil cement (SC) pavement sections for Phase 1 – Administration and Switchgear Buildings and infrastructure, including laboratory mix design and testing for alternative mixes using flyash and slag additives.

DAM AND RESERVOIR PROJECTS

- **Alamitos Reservoir, Long Beach, California**

Project Director and Technical Reviewer for slope stability, slope erosion and foundation study project to evaluate the stability of steel tank reservoirs, terrace slope, and to provide design recommendations for foundation support for deep excavation using permanent retaining wall, shoring (tie-back anchors, soldier piles) and caisson foundations. Also, responsible for groundwater monitoring program to evaluate the impact of seepage on adjacent developments.

- **Dos Pueblos Dam, Santa Barbara**

Project Manager responsible for the safety evaluation of the 80-foot high Dos Pueblos Earthfill Dam in Santa Barbara. Supervised field exploration, dynamic laboratory testing, and seismic stability analyses. Evaluated liquefaction potential and carried out deformation analyses. Lab program included performing cyclic simple shear and cyclic triaxial tests. Prepared report of dam safety evaluation for DSOD review. The remedial measures included provision of an abutment buttress and downstream basin for seismic safety. Also provided recommendations to lower permanent reservoir level to ensure dam safety.

- **Lower Dam, Ventura County**

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Technical Reviewer for seismic stability analyses and evaluation of earthquake induced deformations for the earthfill Lower Dam in Ventura, California, located in close proximity to the San Andreas Fault.

- **Mica Dam, British Columbia, Canada**

Senior Geotechnical Engineer responsible for design of dam crest and downstream slope improvements to 800-foot high Mica Earthfill Dam on Columbia River. Also responsible for design and monitoring of dam instrumentation during construction and first filling of reservoir. Coordinated quality control tests on dam fill materials and evaluated material performance.

- **Palisades Reservoir, San Clemente, California**

Project Manager for safety evaluation of dam abutment due to seepage from the reservoir. Performed static and seismic stability analyses and seepage evaluations and design of seepage collection device.

- **Revelstoke Earthfill Dam, British Columbia, Canada**

Senior Geotechnical Engineer responsible for design of the 430-foot high earthfill dam and Resident Engineer during construction of the dam. Design materials included core trench stabilization using electroosmosis and evaluation of fine sands at abutments for liquefaction analyses. Responsible for field CQA of coordination materials involving core, shells, rockfill protection.

MISCELLANEOUS GEOTECHNICAL PROJECTS

- **Confidential Client, Irwindale Gravel Pit**

Technical Expert on evaluation of a 150-foot deep inert debris fill placed in old gravel pit for suitability for commercial development.

- **Los Angeles Metro Rail Red Line, Los Angeles, California**

Technical Reviewer for geotechnical and environmental investigations for the 6.5-mile tunnel alignment and six stations for proposed Eastside Extension including installation and sampling of monitoring wells.

- **Los Angeles Metro Rail Red Line, Santa Monica Mountains Tunnel, California**

Technical Reviewer for the geotechnical investigation of the 14,000-foot long section of the proposed Segment 3 of the Metro Red Line tunnel crossing the Santa Monica Mountains.

- **Mission Viejo and Aliso Viejo Hillside Grading Projects, Orange County, California**

Project Manager and Technical Reviewer responsible for coordinating construction monitoring and materials testing program for over 800 acres of hillside residential and commercial land development in Mission Viejo and Aliso Viejo, California. Tasks performed included grading plan reviews, analyzing and designing cuts, slopes, fills, shear keys, buttresses, and subdrains, designing stabilizing measures for landslides, and coordinating and supervising mass grading fill control, subdrain installation, and settlement monitoring.

- **MWD Inland Feeder System, Los Angeles, California**

Technical Reviewer for geotechnical characterization of the pipelines and portal areas of the San Bernardino mountains segment. This project for the Metropolitan Water District included approximately 50,000 feet of tunnel through hard metamorphic and granitic rock, two miles of pipelines through bouldery alluvium and no major fault crossings.

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- **Queensway Bay Commercial Development, Long Beach, California**

Project Director and Technical Reviewer for geotechnical investigations and foundation recommendations for 15 one- and two-story commercial/entertainment complex structures and a subterranean parking garage. Analysis included shallow footings and mat foundations, driven piles, shoring design for the parking garage and liquefaction mitigation measures.

- **The Pike at Long Beach, Long Beach, California**

Technical Reviewer for geotechnical investigations for dredging, landfilling, and developing Queensway Bay downtown harbor and the Pike project. Investigations included on-shore and off-shore borings, CPTs, seismicity evaluations, liquefaction potential evaluations, seismic slope stability and deformation analyses, foundation design for 2,000 feet of seawall, pier and floating docks, ground improvement with approximately 1,500 stone columns, and pile foundation design.

Publications

- Somasundaram, S., Khilnani, K.S., and Martin, G., 1992, "Performance History and Seismic Retrofit Analysis of a Homogeneous Earthfill Dam." Proceedings, ASCE Specialty Conference on Stability of Slopes and Embankments, Berkeley, July 1992.
- Somasundaram, S. and Khilnani, K., 1991. "Stability of High Refuse Slopes on Synthetic Lining Systems", presented at Geosynthetic '91 North American Regional Conference, February, 1991.
- Khilnani, K.S., Byrne, P. M. and Yeung, K.K., 1982. "Stability of Earthfill Dam Under Seismic Loading", Canadian Geotechnical Journal, February, 1982.
- Khilnani, K.S. and Byrne, P. M., 1981. "Evaluation of Seismic Stability of Foundation Soils Under Revelstoke Earthfill Dam", Proceedings, International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, St. Louis, Missouri, 1981.
- Khilnani, K.S. and Webster, J.L., 1976. "Mica Dam Drainage System", Proceedings, 12th International Congress on Large Dams, Mexico City, Mexico, 1976.