



# News @ K+A

Kumar & Associates  
www.kumarusa.com

## Denver

2390 S. Lipan Street

Denver, CO 80223

303-742-9700

## Colorado Springs

6735 Kumar Heights

Colorado Springs, CO 80918

719-632-7009

## Fort Collins

1708 E. Lincoln Avenue, #3

Fort Collins, CO 80524

970-416-9045

## Pueblo

4454 Thatcher Avenue

Pueblo, CO 81005

719-565-0507

## Winter Park/Fraser

360 Park Avenue

Fraser, CO 80442

970-722-0310

## Principals

**Narendar Kumar, P.E.**  
**Bruce Berends, P.E.**  
**Roger Barker, P.E.**  
**Alan Claybourn, P.E.**  
**Jeffrey Johnson**  
**Jim Noll, P.E.**

## Current Projects

**Taxiway Extension, La Plata County  
Airport**  
Durango, Colorado  
Client: Carter & Burgess, Inc.

**The Meridian at Landmark, Tower II**  
Greenwood Village, Colorado  
Client: Everest Development Company

**Block 162, Hotel, Mixed Use  
Development**  
Denver, Colorado  
Client: Shames Makovsky Realty

**LiquidMaize Ethanol Plant**  
Lamar, Colorado

## Environmental Services

Fall 2007

Redevelopment of the Denver Metro Area is in full swing with projects such as the Denargo Market, University of Colorado Medical Center and University Hospital, the Gates Rubber Plant, Sundstrand Plant, the Baby Doe's/Chilli Pepper/Hensley Battery site, the Rocky Mountain News building, and many Stapleton Projects, among others. Kumar & Associates, Inc. (K+A) is providing redevelopment services on many of these redevelopment projects including Phase I Environmental Site Assessments, Pre-Demolition Hazardous Materials Surveys including asbestos and lead-based paint, abatement oversight and clearance, as well as geotechnical investigations.

To address the needs of our clients, we have enhanced our industrial hygiene services with the addition of key staff including Kirstie Dineen, H. Kim Thiel and Jeff Martin. K+A's staff is fully trained and certified for services including environmental safety and health; work site health and industrial hygiene; asbestos and lead-based paint surveys; pre-demolition hazardous materials surveys; asbestos project design and abatement oversight; asbestos and lead air monitoring; mold investigations; and radon assessments.

A recent project that serves as an example of our complete environmental and industrial hygiene services involved a large agricultural tract of land and buildings in Elbert County, Colorado. As part of the due diligence performed by a prospective purchaser, K+A performed a Phase I Environmental Assessment which resulted in findings of above-ground storage tanks (ASTs) containing fuels, pesticides and herbicides, and solid waste disposal in an on-site landfill. Phase II Investigations were performed to evaluate the potential for the release of hazardous compounds from the ASTs and the landfill through sampling and laboratory analysis of soil and ground-water. The results of sample analyses confirmed that impacts to soil and ground water were below applicable State of Colorado Department of Public Health and Environment standards. After the prospective buyer reached agreement with the seller to remove the landfilled materials and demolish selected buildings at the site, K+A performed the landfill cleanup and further evaluated soil and ground water quality through additional confirmation sampling and analysis. K+A also performed pre-demolition hazardous materials sampling of the buildings including asbestos and lead-based paint in compliance with state and county demolition requirements. The client was able to achieve all environmental requirements for site evaluation and cleanup through one cost-effective source: KUMAR & ASSOCIATES, INC.

By: Donald Ganser, P.G.



Before and after pictures of a K+A clean-up of an historic farm landfill.

## GEOTECHNICAL INSTRUMENTATION AND MONITORING

### Ski Slope Monitoring for Deep Excavation Cuts

A three-level parking structure has just been completed at the Winter Park Ski Resort. The structure is located on the west side of Intrawest Placemaking's Village Core Development, and is separated from the ski slope by a 20-foot high retaining wall. A 40-foot cut into the ski slope, and slope stabilization consisting of 70-foot tie-back anchors and horizontal drains were required to prepare the site. Landslide movements were previously triggered by a wall excavation cut into the hillside just north of the proposed structures. Given the sensitivity of the slope to landslide movements, and the unacceptable consequences that a landslide could have on the Village Core Development and ski slope, monitoring of the slope during and shortly after construction of the structures was critical.

As the geotechnical engineer of record, Kumar & Associates, Inc. developed a monitoring plan consisting of inclinometers for monitoring slope movements, in addition to ground water level monitoring and visual observations. Inclinometers consist of: (1) initially drilling a boring to 10 to 15 feet below the bottom of likely slope movements (e.g., below the bottom of the cut excavation); (2) installing a specially designed plastic casing in the hole and grouting the casing to the hole sidewalls; and (3) lowering an inclinometer, consisting of cylindrical tilt-meter attached to a cable (shown in the photo) inside the casing to measure casing deformations that occur in response to slope movements. Three 55- to 60-foot deep inclinometers were installed into the hillside, in addition to two piezometers, which were monitored on a twice-weekly to weekly basis during construction. An action response plan for rapid response to any slope movements using temporary slope buttressing was also implemented. Only marginal movements were measured, and the structures were safely constructed without disturbing the ski slope.

K+A is currently monitoring potential impacts of a 30- to 40-foot excavation for a Four Seasons Hotel on the adjacent Holiday House Condominiums in Vail, and is set up to perform similar monitoring for a 40-foot excavation cut into the Winter Park ski slope for the proposed Alpine Club to be located south of the Village Core.



We have also performed pre-construction building condition surveys and developed or reviewed monitoring plans for a number of Denver area projects with construction excavations adjacent to existing structures.

By: Greg Monley, P.E.

