

## San Bernardino County Landfills – Non-Routine Services

San Bernardino County, California

### CLIENT

Solid Waste  
Management Division

### HIGHLIGHTS

- Well maintenance, abandonment, and replacement
- Field and laboratory hydrogeologic investigations
- MODFLOW and MODPATH hydrogeologic modeling
- EMP development and implementation
- CAP containment/treatment system design, construction, and O&M
- Program modifications, including reductions in wells, monitoring parameters, and monitoring frequency
- Liaison with regulatory agencies

GLA has provided San Bernardino County's Solid Waste Management Division (SWMD) with a wide variety of environmental, engineering design, permitting, construction quality assurance (CQA), and litigation support services in support of their environmental monitoring programs. Over the last 20+ years, GLA has developed and implemented more than 720 task orders for a wide range of services that include the following.

### Environmental Monitoring and Reporting Program Modifications

The County's monitoring network includes approximately 400 monitoring stations located at 26 of the County's 39 landfills. GLA routinely evaluates SWMD's monitoring system and has significantly reduced the scope and cost of monitoring by reducing monitoring frequency, the number of monitoring points, and eliminating redundant monitoring parameters. In addition to successfully negotiating reduction in monitoring frequency from quarterly to semi-annual or annual at many landfills, GLA negotiated the complete elimination of monitoring at the Cajon, Plunge Creek, Devore, and Cooley Ranch landfills, and negotiated a reduction in monitoring frequency at the Parker Dam landfill to once every five years. These reductions have resulted in cost savings estimated to be more than \$13 million over the last 15 years.

### Hydrogeologic Investigations and Groundwater Remediation

GLA has conducted hydrogeologic characterizations, evaluation monitoring programs (EMPs), and engineering feasibility studies when impacts to groundwater are identified; and designed, permitted, constructed, and operated remediation systems to treat impacted groundwater. GLA negotiated the corrective action program (CAP) acceptance with the Regional Water Quality Control Boards (RWQCBs), prepared construction-level designs for the remediation system, provided on-site supervision of construction, and prepared the construction completion report. Groundwater treatment systems have included groundwater extraction and treatment, leachate treatment, enhanced landfill gas extraction, vapor extraction, bioremediation, and monitored natural attenuation.



Over the last 15 years, GLA has negotiated with regulators on behalf of SWMD to reduce well monitoring, resulting in an estimated savings of over \$13 million.

## ***San Bernardino County Landfills – Non-Routine Services (page 2)***

### **Litigation Support**

GLA provides technical expert services to support SWMD's legal counsel. Notable work has included expert testimony, groundwater monitoring, and three-dimensional groundwater flow and contaminant fate and transport modeling to demonstrate that the County is not responsible for basin-wide groundwater impacts in the Rialto-Colton basin near its Mid-Valley Landfill. In addition, GLA provided expert testimony and litigation support to demonstrate to the U.S. Environmental Protection Agency (EPA) that the Cajon Disposal site does not contribute to groundwater contamination in the Muscoy plume to any degree of significance. U.S. EPA's acceptance of this finding allowed the Santa Ana RWQCB to approve elimination of monitoring at the site.

### **Well Maintenance, Construction, and Abandonment**

GLA has installed more than 100 monitoring wells and abandoned more than 20 wells. Work has included installation/abandonment workplan preparation, negotiations with the RWQCBs, well permitting, drilling contracting, providing field supervision and logging, well development, and preparation of well construction reports for agency submittal. GLA also periodically conducts down-hole inspections of existing monitoring wells when the well is no longer functioning as designed. GLA contracts with geophysical companies to conduct downhole video inspections of problematic wells to assess the well condition and develop a suitable course of action to repair or replace the well based on the inspection findings. In addition, GLA has coordinated and supervised well maintenance, including replacement of pumps, well monument and bollard replacement, revising well-head labels, and vegetation removal in the vicinity of monitoring wells.

### **Treatment System Operations and Maintenance**

The County's Mid-Valley, Milliken, and Heaps Peak landfills are equipped with groundwater and/or leachate treatment systems that require periodic inspection, maintenance, and servicing. GLA monitors treatment system performance and provides recommendations to the County for optimizing their performance. In addition, GLA coordinates, supervises, and documents contracted work on each system. This work has included coordination of granular activated carbon change-outs, testing, and repairs of leachate collection and removal system components, soil-vapor extraction system adjustments, groundwater extraction system adjustments, and bioremediation system media replacement and inoculation.

### **Septage Impoundment System Operations and Maintenance**

Septage impoundments at the Barstow and Landers landfills are equipped with leachate collection and recovery systems (LCRSs) that required quarterly monitoring of moisture conditions in surrounding soils, and weekly inspection of the LCRSs and removal of accumulated liquids when necessary. For the Landers landfill, GLA designed and installed a solar-powered pumping system to remove liquids from the LCRS sump and maintain liquid levels below prescribed levels.