



## SITE REMEDIATION

As demonstrated in the following representative project descriptions, EMC<sup>2</sup> staff has experience preparing and implementing site remediation designs for a variety of projects located throughout the United States. Our services range from preparing remedial action plans, specifications and drawings through providing turnkey site remediation services.

**Gypsum Stack Reclamation** – EMC<sup>2</sup> staff provided on-site engineering and general contracting services during implementation of a phospho-gypsum piles reclamation plan in Missouri. The work included: handling 350,000 cubic yards of materials to regrade the gypsum stacks and place a low permeability clay cap to reduce radon emissions and precipitation infiltration; construction of sediment basins and site channels to route storm water and control sediment transport; development of an on-site borrow area to supply clay for the cap; and post construction revegetation and reforestation site wide.



**Gypsum Stacks Reclamation**

**Hudson River PCB Superfund Site** – EMC<sup>2</sup> staff provided general contracting services to cap 50 acres of PCB-impacted soils/sediments in four remnant deposits located along both banks of the Hudson River in upstate New York. A 460-foot-long temporary bridge was erected to access both sides of the river and minimize construction traffic through neighborhoods. Over 400,000 cubic yards of cover/waste materials were transported/regraded to promote drainage. Fifty acres of geosynthetic clay liner and a lateral sand drainage layer were placed over the four regraded remnant deposits to minimize infiltration. Over 4,000 linear feet of geotextile and riprap were placed for erosion control along the riverbanks of the remnant deposits. Over 2,000 linear feet of HDPE lined transfer channels were constructed to route storm water around and across the capped areas to the river. Three separate borrow areas were developed/reclaimed and over 200 acres were topsoiled and revegetated.

**Petroleum Refinery Remediation** – EMC<sup>2</sup> staff designed and implemented bioremediation projects for hydrocarbon-contaminated soil and sludge at two operating refineries in Vancouver and Montreal, Canada. The treatment included: material conditioning through screening to remove rock; and gypsum addition/mixing/windrow drying to homogenize the material and improve its air-flow properties. Nutrients were then added and the material was placed in engineered aeration cells. Contamination levels were reduced from as much as 10% hydrocarbon to less than 0.1% after approximately four months of aeration and irrigation.

**Defense Depot Superfund Site Remediation** – EMC<sup>2</sup> staff provided general contracting services for a contaminated aquifer characterization/VOC plume delineation to provide baseline data for an extraction, treatment and reinjection design. Construction work: installed/sampled pumping, injection and monitoring wells; sampled 27 existing monitoring wells; and separate excavation and manifesting of a impacted soils from a pesticide/herbicide pit that were containerized and manifested for off-site incineration.

**Petroleum Retail Stations Remediation** - EMC<sup>2</sup> staff designed, installed and operated soil and groundwater treatment systems at numerous gas stations in Colorado. Soil vapor extraction systems were used to remediate soils and to mitigate the potential for petroleum gas buildup in surrounding structures at four sites. Groundwater extraction, air stripper treatment, product recovery and aquifer air sparging were implemented at three sites to remediate groundwater. Computerized control panels with autodialers were installed at two of the sites to regulate remedial system performance and to prevent out-of-compliance discharges.

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