Civil & Environmental Consultants, Inc.

Ozone Treatment

CEC offers engineering, design, and construction services to treat organic compounds found in landfill waste streams or contaminated soil and groundwater. Ozone is a powerful oxidizer that does not require hazardous chemical handling or use. CEC's coordinated approach saves resources and time by treating or remediating the contaminated media on site.

IN SITU REMEDIATION

CEC engineers and geologists also provide comprehensive services to design ozone injection systems for the remediation of chlorinated solvents and other organic compounds in groundwater. Advantages of ozone injection remediation include:

- A quicker cleanup compared to more traditional cleanup methods
- A smaller footprint compared to other cleanup methods
- The capability to be implemented in remote locations
- The capability to be injected through soil and groundwater into hard-to-reach areas (e.g. beneath buildings)
- Exceptional efficacy in treating volatile organic compounds
- A short half-life, which allows in situ treatment of specific volumes with no release to the environment
- The dosage of ozone is easily controlled to match concentrations of the contaminant of concern

LANDFILL GAS CONDENSATE

CEC engineers provide comprehensive services to design ozone treatment systems to oxidize high levels of organics in landfill gas condensate and leachate. This pre-treatment can allow for discharge into publicly owned treatment plants instead of containerizing and hauling the liquid off-site for disposal. Ozone can effectively treat a variety of compounds, including:

- Total petroleum hydrocarbons, which include benzene, toluene, ethylbenzene, and xylenes (BTEX)
- Fuel additives, including MTBE and TBA
- Chlorinated solvents, including PCE and TCE
- Polychlorinated biphenyls
- Phenols
- Pesticides

CEC's diverse civil engineering and environmental expertise is applied to the following ozone treatment services for clients in the landfill management and land development industries:

- Civil Engineering Services
  - Construction siting and permitting
  - System pilot study and system design
  - Construction oversight
- Environmental Engineering and Sciences
  - Source identification and sampling
  - Site investigation and contaminant delineation
  - Environmental permitting
  - System operations, monitoring, and maintenance
  - System start-up and operator training