



## **OZONE CASE STUDY**

### **Landfill Leachate**

### **Montgomery County, TN**

### **Ex-Situ Ozone Injection**

#### **Background**

Soil and groundwater at a landfill site was contaminated with high levels of chlorinated compounds, TOC, odor issues, and surfactants. The landfill could no longer send untreated leachate to their municipal water treatment system. Dichloroacetate (DCA) and other chlorinated compounds were also Contaminants of Concern (COC).

The landfill was in need of a system that could be up and running within 2 months. Piper Environmental Group, Inc. is unique to the industry in that we have multiple large scale rental systems available for immediate use. This eliminated the need for lengthy pilot studies and bench top lab studies.

#### **Solution**

A solution was prepared rapidly for a system able to treat 10,000-20,000 gallons of leachate per day running at 100 GPM. Piper Environmental Group, Inc., with large scale ozone system experience, worked closely with project engineers, providing engineering design and layout recommendations, as well as the ozone generators, contacting tanks, degassing, and ozone fugitive destruction. Piper Environmental Group, Inc. worked with the landfill's engineers to design an ozone + hydrogen peroxide advanced oxidation system. This was then implemented in the two month time-frame with ozone system installation and operation in a place where Safety is of utmost concern.

Piper Environmental Group, Inc.'s 56 pound per day (PPD) ozone trailer was chosen for ex-situ chemical oxidation based on ability to respond quickly, Health and Safety concerns, implementation ease, cost, and most importantly, effective removal of COC's and the absence of negative impact to groundwater quality.

The final gas stream composition was 2% ozone concentration. The treatment system was on site for 13 months, from April of 2008 to May of 2009, automatically injecting ozone + hydrogen peroxide into the leachate discharge.

#### **Results**

The project was successful with significant chlorinated compound reductions observed in groundwater both on and off-site. Piper Environmental Group, Inc. helped the engineering firm and client remediate the former manufacturing site using a sophisticated in-situ technology that safely, quickly and effectively destroyed contaminants. As a result of the successful project in 2011, the landfill began construction of a lagoon system for leachate. As the lagoon system came on line, leachate was treated onsite resulting in less liquid being transported for treatment. Cleaning leachate on site saves tens of thousands of dollars each month. Montgomery County expects the lagoon to be 100% self-sufficient in 2012. The clean water will be used to irrigate land at the site.

#### **Conclusion**

Piper Environmental Group, Inc. proved that its large ozone systems can perform safely and cost-effectively. The equipment was reliable, produced desired results, and saved time and money. One significant money saving consideration for the client was to avoid the waste disposal fines at a cost savings of \$100,000/month.

## Rental Ozone Generation

- ◆ Two (2) ozone generators producing a total of 56 pounds per day
- ◆ One (1) air compressor
- ◆ One (1) air dryer and filter train
- ◆ One (1) chiller for ozone generators
- ◆ One (1) stainless steel tank with mixing, contacting, degassing, and ozone destruct
- ◆ Final gas stream composition: 2% ozone
- ◆ Generator operated at 15 psig
- ◆ Mixing pump rated at 200 GPM with 100' TDH

## Components Purchased from Piper

- ◆ Dew-point monitor
- ◆ Ozone monitoring system
- ◆ Distribution manifold as described below

## Ozone Monitoring System

- ◆ Ozone monitor located inside ozone generation trailer
- ◆ Ozone detection automatically shuts down ozone production

## Ozone System Distribution Manifold

- ◆ Two (2) 1/2" Teflon tubes carry the ozone
- ◆ Two (2) 2" Mazzei injectors for mixing ozone into the water ex-situ

## Fugitive Ozone and Destruct

- ◆ Nominal flow of 100 GPM at 45 psig
- ◆ Off gas handled by degas valves to an ozone destruct unit
- ◆ Manganese Dioxide is the destruct catalyst

## Off Gas Treatment

- ◆ Activated carbon adsorption
- ◆ Ozone destruct catalyst

## Treatment Operation Summary

- ◆ System operation: April, 2008— May 2009



**Ozone Rental Systems may be found here:**

<http://www.peg-inc.com/rentals/ozone-remediation-trailers/>

## Company Profile

*Piper Environmental Group, Inc. offers ozone technology, equipment, and services for a wide-range of environmental applications. The company designs, manufactures, and integrates ozone systems and related equipment for short and long-term projects, offering equipment for rent or purchase. Services include project design assistance, oxidation pilot studies, contract service, equipment repair, consulting. Our area of expertise is large remediation projects.*