



## **OZONE CASE STUDY**

### **Pantex DOE Site**

### **Amarillo, TX**

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

#### **Background**

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

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 field-engineer an ozone + peroxide advanced oxidation system and implemented the 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 safety, implementation ease, cost, and most importantly, 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 into the leachate.

#### **Results**

The project was successful with significant Chlorinated compound reductions observed in soil and 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, Bi-County began construction of a lagoon system for leachate. As the lagoon system came on line leachate was treated onsite resulting in less of the liquid being transported for treatment. Cleaning leachate on site saves tens of thousands of dollars each month. Bi-County expects the lagoon to be 100% self-sufficient in 2012. The clean water will be used to irrigate the 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) chiller for ozone generators
- ◆ Final gas stream composition: 2% ozone
- ◆ Generator operated at 15 psig
- ◆ Mixing pump rated at 200 GPM with 100' TDH

## Components Purchased from Piper

- ◆ Dewpoint 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.*