1108-65-441   **David A Fischer*** (`dfischer@qedenv.com`), PO Box 3726, Ann Arbor, MI 48106, and **Hongli Gao** (`gaohongl@msu.edu`), Lansing, MI. *Mathematical Methods as Applied to Landfill Gas Data.* Preliminary report.

Solid waste landfills collect data from the operation of landfill gas (LFG) collection systems. Systems have 50-200 LFG collection wells, with up to 10 data elements collected semimonthly (130K-500K values/year). Data is collected over the full life of the landfill (50+ years) and includes meta-data (barometric pressure, etc.). This data is vital for regulatory reporting and system control. Automated data collection methods (IoT) are under consideration to improve efficiency. IoT will increase data density and require better improved analysis. QED has worked with the MSIM program to investigate analysis approaches. Efforts include data "cleaning", statistical tests, Artificial Neural Network (ANN) modeling, hierarchical clustering and classification and graphical methods.

The ANN model has been widely used in pattern recognition, data classification, etc., and will be presented in this talk. In the methane capture modeling, the input vector of selected variables (input neurons) and the methane capture (output neuron) are used to start the network. After being weighted and transformed by activation function the activations of these neurons are passed onto the next layer of neurons. This process is repeated until the Mean Square Error of methane percentage is minimized. (Received January 19, 2015)