

## G. ALEX STEGE

### Education

M.A. – Geography (Geomorphology), University of California, Los Angeles, 1996

B.S. – Geology, Tufts University, 1981

### Professional Affiliations

Solid Waste Association of North America (SWANA). Served as the chairman of SWANA's Generation and Modeling Committee from 2003 to 2015.

International Solid Waste Association (ISWA). Active member of the Working Group on Climate Change and Waste Management.

### Professional Experience

Alex Stege provides SCS with expertise in assessing landfill gas (LFG) to energy and high-Btu methane utilization project feasibility based on the application of empirical models to estimate LFG recovery. Over the past 25 years, Mr. Stege developed LFG recovery projections to support methane utilization project feasibility and financing for hundreds of landfills in the U.S. and throughout the world for the U.S. EPA's Landfill Methane Outreach Program (LMOP), World Bank, International Finance Corporation, landfill owners, municipalities, and LFG project developers.

Alex Stege was a primary author of a Solid Waste Emissions Estimation Tool (SWEET) for the U.S. EPA's Global Methane Initiative (GMI) and the Climate and Clean Air Coalition (CCAC). SWEET provides realistic, long-term GHG emissions estimates for the waste management sector to help guide solid waste planning. He currently is assisting the ISWA in the application of SWEET to support of their initiative to close dumpsites around the world.

Alex Stege leads the non-regulatory LFG modeling services at SCS that leverage our companywide expertise in landfills and LFG collection systems to more accurately assess methane recovery and emissions. SCS's LFG recovery modeling practice is based on the scientific application of actual flow and site data to develop an empirically calibrated LFG recovery model. Alex Stege prepares or reviews domestic and international LFG modeling/due diligence studies for SCS offices throughout the U.S. He also provides training in LFG recovery modeling to SCS staff, updates senior SCS staff on recent modeling work at annual meetings, and is responsible for the ongoing development of SCS's domestic and international LFG models and for maintaining SCS's leadership in the field of LFG modeling. Alex Stege has developed a model calibration procedure, applied SCS's collection system design and operations expertise and its vast database of LFG flow and site data, and created an empirically-based model which accounts for the effects of collection system coverage/efficiency, site conditions, waste moisture, and waste composition on LFG recovery.

Mr. Stege was the author of several international LFG models and user's manuals for LMOP and GMI, including: (1) the Central-Eastern Europe LFG Model; (2) the Colombia LFG Model; (3) the Ukraine LFG Model; (4) the Mexico LFG Model (versions 1 and 2); and (4) the Central America Model. He is a frequent speaker at U.S. and international conferences on waste management that address landfill methane recovery, utilization, and emissions, and other waste sector GHG emissions.

## Conference and Workshop Presentations (2010-2020)

Global Waste Management Symposium (GWMS), February 24, 2020, Indian Wells, CA. "California's Senate Bill 1383: Effects on Organic Waste Disposal & Methane Generation, Recovery, and Emissions".

International Solid Waste Association (ISWA) World Congress, October 7-9, 2019, Bilbao, Spain: "Landfill Methane, Black Carbon, and the Solid Waste Emissions Estimation Tool ("SWEET")".

International Solid Waste Association (ISWA) World Congress, October 22-24, 2018, Kuala Lumpur, Malaysia: "Evaluating the Effects of Closing Open Dumps on Greenhouse Gas and Short-Lived Climate Pollutant Emissions".

Solid Waste Association of North America (SWANA) - SWANAPalooza 2018, March 7, 2018, Denver, CO: "Changes in the Quantity and Composition of U.S. MSW and Effects on LFG Generation".

Global Waste Management Symposium (GWMS), February 14, 2018, Indian Wells, CA. "The Development of SWEET – Solid Waste Emissions Estimation Tool".

ISWA World Congress/WASTECON, September 25-27, 2017, Baltimore, MD: "Quantifying Greenhouse Gas Emissions from Waste Management".

ISWA World Congress/WASTECON, September 25-27, 2017, Baltimore, MD: "Changes in the Quantity and Composition of U.S. MSW and Effects on LFG Generation".

SWANA Northwest Chapter Conference, April 26, 2017: "Effects of Landfill Gas Emissions Reduction Strategies".

SWANA's 39th Annual Landfill Gas Symposium, April 6, 2016 (with Bob Isenberg), Monterey, CA: "Landfill Settlement: The Benefits of Knowing What's Going On Inside, Outside, and What's Leaving Your Landfill".

GWMS, February 2, 2016, Indian Wells, CA: "The Effects of Organic Waste Diversion on LFG Generation and Recovery from U.S. and California Landfills".

Environmental Research & Education Foundation (EREF) Regional Summit, November 13, 2014, Austin TX: "Correlating Landfill Gas Modeling to Practice and Policy".

GWMS June 23, 2014, Orlando FL: "Central-Eastern Europe GMI Landfill Gas Model".

SWANA's 37th Annual Landfill Gas Symposium, March 27, 2014, Monterey, CA: "The Effects of Organic Waste Diversion on LFG Generation and Recovery from U.S. Landfills".

SWANA's 36st Annual Landfill Gas Symposium March 18-21, 2013, Las Vegas, NV: "Estimated 100-Year Collection Efficiency for U.S. Landfills".

GWMS, October 1, 2012, Phoenix AZ: "Evaluating the Historical Performance of Landfill Gas Projects Developed Under the CDM".

SWANA Northwest Chapter Conference, April 19, 2012: "Evaluating the Impacts of Organic Waste Diversion in the Pacific Northwest on LFG Recovery".

Global Methane Initiative (GMI) Workshop, Bogota Colombia, December 2011: "Colombia Landfill Gas Model" and "Demonstration of the Colombia Landfill Gas Model".

14th Annual Landfill Methane Outreach Program (LMOP) Conference and Project Expo, January 2011: "Introducing a New Landfill Gas Model for Colombia".

Methane to Markets Partnership Expo: Delhi, India, March 2-5, 2010: "Steps Towards Initiating LFG Utilization Projects in Developing Countries – Planning Process, LFG Models, and Managing Project Expectations".

13th Annual LMOP Conference and Project Expo, January 2010: "LMOP's New LFG Models for Mexico and Ukraine – Tools for LFG Project Screening and Assessment".