One Day Course Brought to You by
Canadian Prairies and Northern Section (CPANS)
of the Air & Waste Management Association (A&WMA):

INTRODUCTION TO AIR QUALITY DISPERSION MODELLING

Date: June 13, 2017
Time: 8:30 AM to 4:30 PM
Cost: $300 – A&WMA Member
$350 – Non-Member
Location: Ball Room in Ramada Hotel Downtown Calgary
708 8th Avenue S.W
Calgary, Alberta T2P 1H2
Registration: https://cpans2017.wufoo.eu/forms/cpans-introduction-to-air-quality-modelling/

Intended Audience

This one-day introductory course is designed for permitting staff, regulators, consultants, engineers, and managers with ambient air quality management responsibilities. The course will consist of technical lectures with relevant examples. Topics include air quality issues, fundamentals of meteorology, air quality model types and selection, emission estimates. There will be no hands-on training. The full CALPUFF/CALMET course will be offered by CPANS in October 2017.

At the end of the course, attendees will:

- have a better understanding of the key meteorological processes that impact air quality,
- be able to select the appropriate model(s) to address specific air quality issues; and
- be able to assess necessary input data and critically review air quality modelling studies.

Instructors

Dr. Francoise Robe is an air quality and environmental specialist with over 20 years' experience in advanced meteorological and air dispersion modelling. She holds a Ph.D. in meteorology from the Massachusetts Institute of Technology, a M.Sc. in Marine Modelling, and a B.Sc. in physics from the University of Liege. She has managed and conducted numerous meteorological and air quality studies, environmental impact assessments, accidental release assessments, and multi-disciplinary environment-health-safety projects worldwide. These studies have been conducted for offshore and onshore oil and gas upstream and downstream facilities, mines, smelters, power plants, airsheds, as well as for weather forecasting purposes. Dr. Robe has pioneered developing integrated automated real-time and forecast air quality modelling systems. She has written over 50 technical reports and scientific articles, and has presented several papers at international scientific conferences. She is one of the authors of the US-EPA CALPUFF modelling suite, and has taught over 30 CALPUFF and air quality training courses for regulatory agencies, universities, consultants, and industry. Francoise is a senior consultant with RWDI, and their oil-gas business sector lead.

Dr Piotr Staniaszek has more than 23 years of experience in air quality consulting including more than 20 years as an air dispersion modeller. He has managed and executed numerous dispersion modeling projects for oil and gas facilities throughout Alberta. He has participated in FAP/SIA database development and CALPUFF and CMAQ modelling for FAP, CEMA and AEP. He has organized and co-instructed several CALPUFF/CALMET introductory and advanced courses. Dr. Staniaszek was also co-instructor in a two day training course entitled *Guidance on Review of Air Quality Environmental Assessment Reports*. Dr. Staniaszek

is also a Sessional Instructor at the University of Calgary. His areas of focus include emission estimation, air quality assessments and meteorological data analysis/interpretation. Dr. Staniaszek has experience developing emissions inventories, models and preparation of Environmental Impact Assessments (EIAs) for the oil sands, pulp and paper, coal, mineral, and petrochemical industries. He has written numerous air quality management plans including flaring and dust management plans. Dr. Staniaszek was also involved in the advancement of the AERflare and ABflare spreadsheets, conducting various pilot tests to identify potential bugs and refining the design of flare stacks at a new refinery constructed in the Redwater area. Presently, Dr. Staniaszek is Air Quality Group leader for SNC-Lavalin Inc.

Course Outline

Check-in: 8:00 am – 8:30 am

Morning 1: Air Quality Issues Overview (8:30 am – 10:15 am)
- Air Quality Issues
- Near-field vs. Short and Long Range Models
- Screening vs. Refined Models
- Complex Modelling for EIA's
- Emission Sources: point, area, volume, line sources, and flares
- Variable Emission Sources
- Roads and Modelling of Explosions Emission

Morning Coffee Break Q/A: 10:15 am – 10:30 am

Morning 2: Meteorology (10:30 am – 12:00 pm)
- Boundary Layers Fundamentals
- Meteorological Input to Air Quality Models
- Prognostic (MM5 / WRF) vs. Diagnostic (CALMET)
- Observations and Meteorological Processors (AERMET, MMIF)
- Meteorological Model Evaluation and Influence of Meteorology on Dispersion Model Results

Lunch Break: 12:00 pm – 1:00 pm (Lunch will be provided)

Afternoon 1: Air Dispersion Modelling in More Detail (1:00 pm – 2:30 pm)

- Lagrangian Puff (CALPUFF) vs. Gaussian Plume (AERMOD) Models
- Lagrangian (CALPUFF) vs. Eulerian (CMAQ) models
- Interpreting Modelling Results
- Dispersion Model Performance Validation and Evaluation
- Sources of Model Inaccuracy

Afternoon Coffee Break: 2:30 pm – 2:45 pm

Afternoon 2: Specialty Modelling (2:45 pm – 4:15 pm)

- Fog and Visibility
- Odour Modelling
- NO_2 Modelling
- Flare Modelling (AERFlare, ABFlare)
- Modelling of Haul Roads and Mining Emissions

Questions & Answers: 4:15 pm – 4:30 pm