



# NATIONAL AIR QUALITY TRAINING PROJECT

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## GAP ANALYSIS CONCERNING PROFESSIONAL COMPETENCIES

### **FINAL REPORT**

**FEBRUARY 2012**

**MARAMA**

**Mid-Atlantic Regional Air  
Management Association, Inc.**

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#### **APPENDIX A – LIST OF PRIVATE/PUBLIC PROVIDERS FOR GAP FILLING**

## LIST OF ACRONYMS

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AERMOD	American Meteorological Society and the U.S. Environmental Protection Agency Regulatory Model Improvement Committee ( <b>AERMIC</b> ) <b>Model</b>
AERSCREEN	AERMOD Screening Model
AQ	Air Quality
AQS	Air Quality System
BACT	Best Available Control Technology
CAA	Clean Air Act
CALPUFF	California Puff Air Dispersion Model
CAM	Compliance Assurance Monitoring
CAMx	Comprehensive Air Quality Modeling with extensions
CARB	California Air Resources Board
CEMS	Continuous Emission Monitoring
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Equivalent Carbon Dioxide
COMS	Continuous Opacity Monitoring System
CPMS	Continuous Parameter Monitoring System
CSAPR	Cross-State Air Pollution Rule
ENERGY STAR EnMS	ENERGY STAR Energy Management System
EPA	U.S. Environmental Protection Agency
FIRE	Factor Information Retrieval Software
GHG	Greenhouse Gas
HAP	Hazardous Air Pollutant
HAZWOPER	Hazardous Waste Operation and Emergency Response
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory Model
I/M	Vehicle Inspection and Maintenance
ICE	Internal Combustion Engines
ISO	International Organization for Standardization
MM5	PSU/NCAR Mesoscale Model Version 5
MOVES	Motor Vehicle Emission Simulator
NAA	Non-Attainment Areas
NAAQS	National Ambient Air Quality Standards
NATA	National-Scale Air Toxics Assessment
NESHAP	National Emission Standards for Hazardous Air Pollutants
NNSR	Non-Attainment New Source Review
NSPS	New Source Performance Standards
NSR	New Source Review
OBD	On-Board Diagnostics
ODS	Ozone Depleting Substances
PAQO	Primary Quality Assurance Organization
PM	Particulate Matter
PPE	Personal Protective Equipment
PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance/Quality Control
RMP	Risk Management Plan

## LIST OF ACRONYMS (continued)

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SBCSD	World Business Council for Sustainable Development
SCREEN3	Single source Gaussian plume model
SIP	State Implementation Plan
SMOKE	Sparse Matrix Operator Kernel Emissions
SOPs	Standard Operating Procedures
TAP	Toxic Air Pollutant
UNIX/LINUX	Multitasking and multiuser operating system
UNMIX	EPA receptor model
VOC	Volatile Organic Compound
WATER9	Wastewater treatment model
WBCSD	World Business Council for Sustainable Development
WRF	Weather Research and Forecasting Modeling
WRI	World Resources Institute

# **MARAMA National Air Quality Training Guide**

## **Gap Analysis Concerning Professional Competencies**

### **INTRODUCTION AND PURPOSE**

This is the third document in a series of reports prepared for the National Air Quality Training Project under an assignment being managed by the Mid-Atlantic Regional Air Management Association (MARAMA). Funding for the assignment has been provided by the US Environmental Protection Agency (EPA) under Assistance Agreement XA 97390701. The first two reports include:

- Catalog of Courses (August 2011), and
- Technical Training Needs Summaries (September 2011).

The first report provides an organized set of descriptions for air quality technical training courses offered by the EPA's Air Pollution Training Institute (APTI) and California Air Resources Board (CARB). The second report summarizes the technical training needs associated with designated skills and knowledge needed by air quality professionals working in state and local air quality agencies.

The purpose of this third report is to compare the training needs identified in report #2 with the courses described in report #1 to identify gaps and then evaluate whether courses offered by other training providers might address those needs not covered by EPA or CARB courses. Overall, report #3 summarizes a gap analysis conducted for each of the ten functions used to organize the first two reports in this series, which are listed as follows:

#### Functions Requiring Air Pollution Training

1. Introduction to Air Pollution Control
2. Ambient Monitoring, QA/QC, & Data Analysis
3. Emissions Estimation & Inventory Development
4. Modeling, Forecasting, & Data Analysis
5. Planning/ Regulation Development
6. Permit Writing
7. Inspection & Enforcement
8. Air Toxics / Hazardous Air Pollutants
9. Mobile Sources
10. Climate Change

To identify the potential for gap filling, the assessment included potential courses offered by trade associations (such as the Air & Waste Management Association and Greenhouse Gas Management Institute), programs within EPA or other governmental agencies (such as the Federal Highway Administration and EPA's New Source Review section), and additional private providers with recognized professional education programs focuses on air quality (such as Trinity Consultants, RTP Environmental Associates, Lakes Environmental, and others).

This report begins with high level summary of findings and progresses through two levels of increased detail. Introductory material includes the following:

- ❖ List of frequently used acronyms or abbreviations
- ❖ Background on the assignment and an overview of gap analysis results
- ❖ Definitions of the functions requiring air pollution training

Detailed findings from the gap analysis are presented in a tabular format. Thus, the main body of the report comprises the following lists of information:

- ❖ Brief summary for each of the ten functions of the strengths and weaknesses of available APTI and CARB courses as well as potential resources available to fill gaps
- ❖ Detailed summary by function of the deficiencies and course options for addressing any gaps
- ❖ Tabular listing for each skill (on a function basis) with suggested relevant courses and with applicable ratings and comments
- ❖ List of providers (public and private) for gap filling (see Appendix A)

This report presents an evaluation of available courses as of late 2011/early 2012. This information will help MARAMA and other members of the Training Committee of the National Association of Clean Air Agencies (as well as EPA and CARB) review their course offerings and establish priorities for future improvements. MARAMA, EPA, and other members of the training committee will continue to seek additional information regarding training needs and resources available to meet those needs as they implement their training programs.

## **OVERVIEW OF GAP ANALYSIS RESULTS**

The gap analysis findings indicate that, for many of the 10 functions, existing APTI and CARB courses address the requisite professional competencies reasonably well. The table below provides an overview of the gap analysis results. As illustrated, the assessment resulted in a “high” or “high/medium” rating for 5 of the 10 air quality functions with respect to existing courses addressing the requisite knowledge and understanding. Functions receiving the top ratings included:

- ❖ Introduction to Air Pollution Control
- ❖ Ambient Monitoring, QA/QC, & Data Analysis
- ❖ Modeling, Forecasting, & Data Analysis
- ❖ Permit Writing
- ❖ Inspection & Enforcement

The air quality functions for which moderate to significant gaps were identified include the following:

- ❖ Emissions Estimation and Inventory Development
- ❖ Planning/Regulation Development
- ❖ Air Toxics/Hazardous Air Pollutants
- ❖ Mobile Sources
- ❖ Climate Change

#	Air Quality Function	Rating	Gap Filling Available/Venue?
1	Introduction to Air Pollution Control	High	N/A
2	Ambient Monitoring, QA/QC, & Data Analysis	High/Medium	Yes Private venue courses available to address noted gaps
3	Emissions Estimation & Inventory Development	Medium	Yes Public venue courses available to address some noted gaps
4	Modeling, Forecasting and Data Analysis	High/Medium	No
5	Planning/Regulation Development	Medium	Yes Public venue courses available to address noted gap
6	Permit Writing	High/Medium	Yes Public and private venue courses available to address noted gaps
7	Inspection & Enforcement	High/Medium	Yes Private venue courses available to address some noted gaps
8	Air Toxics/Hazardous Air Pollutants	Medium	Yes Public and private courses available to address some noted gaps
9	Mobile Sources	Low	Yes Public and private venue courses available to address some noted gaps
10	Climate Change	Low	Yes Public and private venue courses available to address all noted gaps

## DEFINITIONS

<b>Introduction to Air Pollution Control</b>	These courses are designed for regulatory personnel who are new or will be beginning their career in the air quality regulatory field.
<b>Pollution Control Foundations</b>	These courses present fundamental information on the formation and control of various air pollutants.
<b>Ambient Monitoring, QA/QC, &amp; Data Analysis</b>	These courses are designed for individuals within a regulatory agency whose role is to provide sampling and laboratory analysis of ambient air samples. Course topics also include quality assurance/quality control and analysis of ambient air quality data.
<b>Emissions Estimation &amp; Inventory Development</b>	These courses are designed for regulatory personnel who have or will have the responsibility to develop emissions inventories.
<b>Modeling, Forecasting, &amp; Data Analysis</b>	These courses are designed for individuals who will be conducting or interpreting the results of air quality models.
<b>Planning/ Regulation Development</b>	These courses are designed for individuals who will be preparing State Implementation Plans or regulatory language.
<b>Permit Writing</b>	These courses are designed for personnel of state and local permitting agencies who must review and interpret permit applications and prepare permits. There are also relevant courses listed under stationary sources, for example, depending on the individual assignments.
<b>Inspection &amp; Enforcement</b>	These courses are designed for inspectors who determine compliance with air pollution control requirements in permits, regulations, and orders. There are also relevant courses listed under stationary sources, for example, depending on the individual assignments.
<b>Air Toxics / Hazardous Air Pollutants</b>	These courses are designed for individuals who implement programs designed to reduce emissions of toxic or hazardous air pollutants. There are also relevant courses listed under stationary sources, for example, depending on the individual assignments.
<b>Stationary Sources</b>	These courses provide information for regulatory personnel in permits, compliance/enforcement, or planning programs.
<b>Source Sampling and Monitoring</b>	These courses are designed for regulatory personnel who have or will have the responsibility to evaluate source test methods, approve test protocols, and review source test results as required under various federal and state regulations. In addition, these courses are designed for regulatory personnel who have the responsibility to establish requirements in permits or regulatory language for continuous emissions monitoring or compliance assurance monitoring or to evaluate data provided in response to such requirements.
<b>Mobile Sources</b>	These courses are designed for individuals who implement programs designed to reduce emissions from mobile sources, both on-road and off-road.
<b>Climate Change</b>	These courses present information on greenhouse gas emissions estimation and control and fundamental scientific information about climate change.



# *Summary of Gap Analysis Results*

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## **DETAILED SUMMARY OF GAP ANALYSIS FOR EACH AIR QUALITY FUNCTION**

**DETAILED SUMMARY OF GAP ANALYSIS FOR EACH AIR QUALITY FUNCTION**

#	AIR QUALITY FUNCTION	RATING	ASSESSMENT OF STRENGTHS/WEAKNESSES	GAP FILLING POTENTIAL/VENUE
1	Introduction to Air Pollution Control	High	<p><b>Strengths:</b> Very good coverage of basic Clean Air Act concepts and related regulations, math/science concepts for air quality personnel, and air pollution control technologies.</p> <p><b>Weaknesses:</b> None</p>	N/A
2	Ambient Monitoring, QA/QC, & Data Analysis	High/Medium	<p><b>Strengths:</b> Very good coverage of ambient monitoring regulatory requirements, basic data analysis for monitoring purposes, and ambient monitor operational considerations.</p> <p><b>Weaknesses:</b> No courses on: (1) data validation/analysis methods and (2) analysis of monitoring data in the context of regulatory and technical uncertainties</p>	<p align="center">Yes</p> <p>Private venue courses available to address noted gaps</p>
3	Emissions Estimation & Inventory Development	Medium	<p><b>Strengths:</b> Good coverage of emissions inventory techniques, regulatory and permit program relevance of emissions inventories, and technical basis for emissions inventories.</p> <p><b>Weaknesses:</b> No courses on: (1) using source measurements to derive emissions factors, (2) regional emissions inventory methodologies, and (3) mobile source inventory methodologies.</p>	<p align="center">Yes</p> <p>Public &amp; private venue courses available to address items #1 and #3. No courses identified to address item #2.</p>
4	Modeling, Forecasting and Data Analysis	High/Medium	<p><b>Strengths:</b> Very good coverage of air quality modeling regulatory requirements, background on atmospheric science concepts, and the use of modeling outputs in the permitting process.</p> <p><b>Weaknesses:</b> No available classes on forecasting</p>	No

**DETAILED SUMMARY OF GAP ANALYSIS FOR EACH AIR QUALITY FUNCTION (CONTINUED)**

#	AIR QUALITY FUNCTION	RATING	ASSESSMENT OF STRENGTHS/WEAKNESSES	GAP FILLING POTENTIAL/VENUE
5	Planning/Regulation Development	Medium	<p><b>Strengths:</b> Good coverage of the interaction across air quality regulations and the need for establishing emissions limitations for certain source categories.</p> <p><b>Weaknesses:</b> No courses on the rule drafting process.</p>	<p align="center">Yes</p> <p>Public venue courses available to address noted gaps</p>
6	Permit Writing	High/Medium	<p><b>Strengths:</b> Very good coverage of the permit application and permit review process, regulatory applicability analyses, and control technology evaluation.</p> <p><b>Weaknesses:</b> Limited courses addressing (1) advanced analysis under NSR/PSD rules and (2) other non-traditional regulatory requirements (RMP, ODS, Regional Haze).</p>	<p align="center">Yes</p> <p>Public &amp; private venue courses available to address noted gaps</p>
7	Inspection & Enforcement	High/Medium	<p><b>Strengths:</b> Good coverage of the regulatory purpose of inspection/enforcement programs and the inspection process.</p> <p><b>Weaknesses:</b> Limited courses on (1) evaluating compliance test data, (2) CEMS and COMS, (3) understanding of permitting as related to inspectors, and (4) use of inspection databases.</p>	<p align="center">Yes</p> <p>Private venue courses available to address item#1, #2 and #3. No courses identified to address item #4.</p>
8	Air Toxics/Hazardous Air Pollutants	Medium	<p><b>Strengths:</b> Good coverage on the regulatory background for addressing TAPs/HAPs, control approaches for TAPs/HAPs, and use of air quality modeling in TAP risk analyses.</p> <p><b>Weaknesses:</b> Limited courses on (1) NATA reports, (2) advanced concepts on residual risk, (3) public communication of risk and (4) advanced analysis under NESHAP and air toxics rules.</p>	<p align="center">Yes</p> <p>Public and Private venue courses available to address item #2 through and #4. No courses identified to address items#1.</p>

**DETAILED SUMMARY OF GAP ANALYSIS FOR EACH AIR QUALITY FUNCTION (CONTINUED)**

#	AIR QUALITY FUNCTION	RATING	ASSESSMENT OF STRENGTHS/WEAKNESSES	GAP FILLING POTENTIAL/VENUE
9	Mobile Sources	<b>Low</b>	<p><b>Strengths:</b> Some coverage on regulatory and compliance aspects for diesel engines.</p> <p><b>Weaknesses:</b> No courses addressing (1) mobile source emissions modeling, (2) grant applications, (3) alternative fuels, and (4) inspection/maintenance programs.</p>	<p>Yes</p> <p>Private venue courses available to address item #1 and #2. No courses identified to address items #3 and #4.</p>
10	Climate Change	<b>Low</b>	<p><b>Strengths:</b> None</p> <p><b>Weaknesses:</b> No courses addressing (1) climate change science, (2) GHG inventories, or (3) GHG BACT and related control techniques.</p>	<p>Yes</p> <p>Public &amp; private venue courses available to address noted gaps</p>

## *Summary of Gap Analysis Results*

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### **DETAILED SUMMARY OF AVAILABLE COURSES FOR ADDRESSING NOTED GAPS**

**DETAILED SUMMARY OF AVAILABLE COURSES FOR ADDRESSING NOTED GAPS**

#	AIR QUALITY FUNCTION	DEFICIENCY RELATIVE TO EXISTING SUITE OF APTI AND CARB COURSES	RELEVANT PUBLIC VENUE COURSES FOR ADDRESSING GAPS	RELEVANT PRIVATE VENUE COURSES FOR ADDRESSING GAPS
1	Introduction to Air Pollution Control	No deficiencies		
2	Ambient Monitoring, QA/QC and Data Analysis	No courses on: (1) data validation/analysis methods, (2) analysis of monitoring data in the context of regulatory and technical uncertainties		<ul style="list-style-type: none"> <li>• <u>Data Validation Workshop</u> –developed for LADCO by Sonoma Technology</li> <li>• <u>Several Courses</u> offered by EnviroTech Solutions (see Appendix A)</li> </ul>
3	Emissions Estimation & Inventory Development	No courses on: (1) using source measurements to derive emissions factors, (2) regional emissions inventory methodologies, and (3) mobile source inventory methodologies.	<ul style="list-style-type: none"> <li>• <u>MOVES (Motor Vehicle Emission Simulator)</u> offered by the Federal Highway Administration</li> <li>• <u>MARAMA</u> course on Emission Calculations &amp; Data Reduction</li> </ul>	
4	Modeling, Forecasting and Data Analysis	No courses on forecasting (especially setting up and running forecast models)		
5	Planning/Regulation Development	No courses on the rule drafting process	<ul style="list-style-type: none"> <li>• <u>OECA Regulatory Development Training Course</u> offered by National Environmental Training Institute</li> <li>• <u>Risk Communication Course</u> - Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public</li> </ul>	

#	AIR QUALITY FUNCTION	DEFICIENCY RELATIVE TO EXISTING SUITE OF APTI AND CARB COURSES	RELEVANT PUBLIC VENUE COURSES FOR ADDRESSING GAPS	RELEVANT PRIVATE VENUE COURSES FOR ADDRESSING GAPS
6	Permit Writing	Limited courses addressing (1) advanced analysis under NSR/PSD rules and (2) other non-traditional regulatory requirements (RMP, ODS, Regional Haze)		<ul style="list-style-type: none"> <li>• <u>Fundamentals of NSR/PSD Permitting [EMGM-382]</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>NSR/PSD Workshop</u> offered by RTP Environmental Associates</li> <li>• <u>NSR/PSD Workshop</u> offered by Trinity Consultants</li> <li>• <u>EMGM-177: Risk Management Planning: A Technical Review</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-255: Introduction to Visibility Concepts</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-141: Overview of Ozone Depleting Substance Regulations</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>Compliance Workshop for Ozone Depleting Substances</u> offered by Trinity Consultants</li> </ul>

**DETAILED SUMMARY OF AVAILABLE COURSES FOR ADDRESSING NOTED GAPS (CONTINUED)**

#	AIR QUALITY FUNCTION	DEFICIENCY RELATIVE TO EXISTING SUITE OF APTI AND CARB COURSES	RELEVANT PUBLIC VENUE COURSES FOR ADDRESSING GAPS	RELEVANT PRIVATE VENUE COURSES FOR ADDRESSING GAPS
7	Inspection & Enforcement	Limited courses on (1) evaluating compliance test data, (2) CEMS and COMS, (3) understanding of permitting as related to inspectors, and (4) use of inspection databases.		<ul style="list-style-type: none"> <li>• <u>Fundamentals of NSR/PSD Permitting [EMGM-382]</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>NSR/PSD Workshop</u> offered by RTP Environmental Associates</li> <li>• <u>NSR/PSD Workshop</u> offered by Trinity Consultants</li> <li>• <u>CEM Course – CEM Specialties, Inc</u></li> <li>• <u>Several Courses</u> offered by EnviroTech Solutions</li> </ul>
8	Air Toxics/Hazardous Air Pollutants	Limited courses on (1) NATA reports, (2) advanced concepts on residual risk, (3) public communication of risk and (4) advanced permitting.	<ul style="list-style-type: none"> <li>• <u>Risk Communication Course</u> - Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public Involvement</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Fundamentals of NSR/PSD Permitting [EMGM-382]</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>NSR/PSD Workshop</u> offered by RTP Environmental Associates</li> <li>• <u>NSR/PSD Workshop</u> offered by Trinity Consultants</li> <li>• <u>EMGM-177: Risk Management Planning: A Technical Review</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR – 141: Overview of Ozone Depleting Substance Regulations</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>Compliance Workshop for Ozone Depleting Substances</u> offered by Trinity Consultants</li> </ul>
9	Mobile Sources	No courses addressing (1) mobile source emissions modeling, (2) grant applications, (3) alternative fuels, and (4) inspection/maintenance programs.	<ul style="list-style-type: none"> <li>• <u>Mobile Source Emissions Factor Modeling</u> offered by the Federal Highway Administration</li> <li>• <u>Introduction to Transportation Conformity</u> offered by the Federal Highway Administration</li> </ul>	



**DETAILED SUMMARY OF AVAILABLE COURSES FOR ADDRESSING NOTED GAPS (CONTINUED)**

#	AIR QUALITY FUNCTION	DEFICIENCY RELATIVE TO EXISTING SUITE OF APTI AND CARB COURSES	RELEVANT PUBLIC VENUE COURSES FOR ADDRESSING GAPS	RELEVANT PRIVATE VENUE COURSES FOR ADDRESSING GAPS
10	Climate Change	No courses addressing climate change science, GHG inventories, or GHG control techniques.	<ul style="list-style-type: none"> <li>• <u>Modular Training on GHG Permitting</u> offered by US EPA New Source Review section</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Introduction to Climate Change</u> offered by the Greenhouse Gas Management Institute</li> <li>• <u>Managing Greenhouse Gas Emissions</u> offered by Trinity Consultants</li> <li>• <u>Basics of Organizational GHG Accounting</u> offered by the Greenhouse Gas Management Institute</li> <li>• <u>Fundamentals of Organizational GHG Accounting</u> offered by Trinity Consultants</li> <li>• <u>Using Life Cycle Analysis to Reduce Environmental Footprint</u> offered by Trinity Consultants</li> <li>• <u>Greenhouse Gases &amp; Climate Change</u> - Brian Doyle</li> </ul>

Note: This table does not include the following function since they are covered by current APTI and CARB courses:

- Introduction to Air Pollution Control

## *Summary of Gap Analysis Results*

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### **FUNCTION SKILL RATINGS AND SUGGESTED COURSES**

## INTRODUCTION TO AIR POLLUTION CONTROL

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to interpret basic air quality concepts and become familiar with the goals of the CAA and the state/local air quality programs	<ul style="list-style-type: none"> <li>• Understanding the need for programs to implement the regulations and rules that are developed from state and federal laws to protect air quality standards and air quality related values</li> </ul>	<ul style="list-style-type: none"> <li>• APTI-SI-422 [Air Pollution Control Orientation Course]</li> <li>• CARB 101 [Uniform Air Quality Training Program]</li> </ul>	<b>High</b>
Ability to interpret the basic science and math concepts associated with air pollution	<ul style="list-style-type: none"> <li>• Understanding the need to interpret and calculate air quality related data (emissions data, flow data, etc.) correctly</li> </ul>	<ul style="list-style-type: none"> <li>• APTI RE-100-1 [Basic Concepts in Environmental Sciences - Module 1: Basic Concepts]</li> <li>• APTI-RE-100-2 [Basic Concepts in Environmental Sciences – Module 2: Characteristics of Gases]</li> <li>• APTI-RE-100-3 [Basic Concepts in Environmental Sciences – Module 3: Characteristics of Particulates]</li> <li>• APTI-RE-100-4 [Basic Concepts in Environmental Sciences – Module 4: Liquid Characteristics]</li> <li>• APTI-SI-100 [Mathematics Review for Air Pollution Control]</li> <li>• APTI-SI-473A [Beginning Environmental Statistical Techniques]</li> </ul>	<b>High</b>
Ability to interpret how pollutants are regulated	<ul style="list-style-type: none"> <li>• Basic knowledge of federal and state Regulated Pollutants, precursors and pollutants that may be regulated dually (for example methanol is a HAP and VOC)</li> </ul>	<ul style="list-style-type: none"> <li>• APTI-SI-422 [Air Pollution Control Orientation Course]</li> <li>• CARB 101 [Uniform Air Quality Training Program]</li> </ul>	<b>High</b>
Ability to delineate the principles and practices associated with air pollution control	<ul style="list-style-type: none"> <li>• Basic understanding of               <ul style="list-style-type: none"> <li>○ Air pollution permitting and compliance history</li> <li>○ How the functions (or work) within the air quality programs are inter-related with the common goal of complying with the CAA and state and local regulations</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI-SI-105 [Introduction to Air Pollution Control]</li> <li>• APTI SI-422[Air Pollution Control Orientation Course]</li> <li>• CARB 101 [Uniform Air Quality Training Program]</li> <li>• APTI-RE-100-6 [Basic Concepts in Environmental Sciences – Module 6: Air Pollution and Control Techniques]</li> <li>• APTI On-Demand Videos [EPA Clean Air Act Training Modules 1-11]</li> </ul>	<b>High</b>
Safety Skills	<ul style="list-style-type: none"> <li>• Knowledge of hazards that may be encountered in the performance of one’s duties in the office or in the field</li> </ul>	<ul style="list-style-type: none"> <li>• APTI-446 [Inspection Procedures and Safety]</li> </ul>	<b>High</b>

## AMBIENT MONITORING, QA/QC, & DATA ANALYSIS

**Level I:** Beginner – New hire with technical school or college degree; new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to interpret general information about the reference methods, continuous air quality monitors, sampling design and statistical techniques applicable to ambient air monitoring	<ul style="list-style-type: none"> <li>• Understanding of the math and scientific concepts associated with ambient monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• APTI-SI-100 [Mathematics Review for Air Pollution Control]</li> <li>• APTI SI-434 [Introduction to Ambient Air Monitoring]</li> <li>• APTI 435 [Atmospheric Sampling]</li> <li>• APTI SI-474 [Introduction to Environmental Statistics]</li> </ul>	<b>High</b>
Ability to determine the appropriate analytical methods for analysis of each pollutant	<ul style="list-style-type: none"> <li>• Knowledge of the appropriate methods available for collection and analysis of ambient air</li> </ul>	<ul style="list-style-type: none"> <li>• CARB 222 [Principles of Ambient Air Monitoring]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> <li>• APTI – On- Demand Videos [ How to Create a Successful Air Toxics Monitoring Program]</li> </ul>	<b>High</b>
Ability to apply appropriate QA/QC procedures for ambient air monitoring	<ul style="list-style-type: none"> <li>• Knowledge of QA/QC procedures that apply to ambient air monitoring, sampling, and analysis</li> <li>• Understand the principles of monitoring and sampling methods and QC requirements</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> </ul>	<b>High</b>
Ability to provide general maintenance and upkeep of the ambient air monitors used in the agency's network	<ul style="list-style-type: none"> <li>• Knowledge to ensure monitors are operated properly and are kept in good operating order</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-434 [Introduction to Ambient Air Monitoring]</li> <li>• APTI 435 [Atmospheric Sampling]</li> <li>• APTI – On- Demand Videos [ How to Create a successful Air Toxics Monitoring Program]</li> </ul>	<b>High</b>
Ability to install and maintain sites to meet project requirements	<ul style="list-style-type: none"> <li>• Knowledge of relevant regulation and written protocols for monitor and probe siting</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-433 [Network Design and Site Selection for Monitoring PM2.5 and PM 10 in Ambient Air]</li> <li>• APTI SI-436 [Site Selection for Monitoring SO2]</li> <li>• APTI – On- Demand Videos [ How to Create a Successful Air Toxics Monitoring Program]</li> </ul>	<b>High</b>

## AMBIENT MONITORING, QA/QC, & DATA ANALYSIS

**Level I:** Beginner – New hire with technical school or college degree; new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to handle and document ambient samples in accordance with project requirements and regulations and to conduct data analysis	<ul style="list-style-type: none"> <li>• Knowledge of proper handling of ambient samples and appropriate data analysis to evaluate sample results</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> </ul>	<b>High</b>
Ability to review field and QC data to evaluate performance of instruments and diagnose and address potential deficiencies.	<ul style="list-style-type: none"> <li>• Knowledge of appropriate data analysis to apply to evaluate monitoring results</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> </ul>	<b>High</b>
Ability to identify and document exceptional events that require flagging	<ul style="list-style-type: none"> <li>• Knowledge of how to identify and flag exceptional events and how to prepare official documentation to obtain EPA approval for flagging</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-434 [Introduction to Ambient Air Monitoring]</li> <li>• CARB 222 [Principles of Ambient Air Monitoring]</li> </ul>	<b>High</b>
Ability to validate and analyze air quality monitoring data for regulatory determinations	<ul style="list-style-type: none"> <li>• Knowledge of data validation and data analysis methods</li> <li>• Understanding of how to analyze monitoring data in the context of regulatory and technical uncertainties</li> </ul>	None available from existing suite of APTI and CARB courses	<b>Low</b> Gap filling available via courses in private sector. Options include: <ul style="list-style-type: none"> <li>• <u>Data Validation Workshop – developed for LADCO by Sonoma Technology</u></li> <li>• <u>Several Courses</u> offered by EnviroTech Solutions (see Appendix A)</li> </ul>

\* ES = Engineer or Scientist; ET = Environmental Technician

## AMBIENT MONITORING, QA/QC, & DATA ANALYSIS

**LEVEL 2** – Intermediate/Advanced – 3 or more years of ambient air monitoring experience for ET, data analysis, QA/QC analysis and regulatory interpretation and assessment

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to site monitors following federal/state/local protocols to meet project goals	<ul style="list-style-type: none"> <li>• Knowledge of relevant regulations and protocols for monitoring siting</li> <li>• Knowledge of local conditions and constraints applicable to monitoring siting</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 435 [Atmospheric Sampling]</li> <li>• APTI SI-433 [Network Design and Site Selection for Monitoring PM<sub>2.5</sub> and PM<sub>10</sub> in Ambient Air]</li> <li>• APTI SI-436 [Site Selection for Monitoring PM<sub>2.5</sub> and PM<sub>10</sub> in Ambient Air]</li> </ul>	<b>High</b>
Ability to troubleshoot operational and network design problems, provide input to senior management on long-term equipment and network upgrades/design changes	<ul style="list-style-type: none"> <li>• Knowledge of relevant regulatory changes and technical advances</li> <li>• Understand the goals of the agency</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> </ul>	<b>High</b>
Ability to develop Standard Operating Procedures for methods, instruments and sampling methods for air sampling	<ul style="list-style-type: none"> <li>• Knowledge of current criteria pollutant monitoring methods and instruments</li> <li>• Knowledge of air toxics sampling and analytical methods</li> <li>• Knowledge of state of the art monitoring technology</li> <li>• Understanding of staff capabilities and constraints on operations</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> </ul>	<b>High</b>
Ability to interpret new federal and/or state regulation impact on monitoring network methods and design	<ul style="list-style-type: none"> <li>• Knowledge of relevant regulatory changes and technical advances</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> </ul>	<b>High</b>
Ability to evaluate and assess ambient monitoring data for quality, trends, source impacts, attainment status	<ul style="list-style-type: none"> <li>• Advanced knowledge of ambient air pollution chemistry, transport, and statistical analysis methods</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> </ul>	<b>High</b>

\* ES = Engineer or Scientist; ET = Environmental Technician

## AMBIENT MONITORING, QA/QC, & DATA ANALYSIS

**LEVEL 2** – Intermediate/Advanced – 3 or more years of ambient air monitoring experience for ET, data analysis, QA/QC analysis and regulatory interpretation and assessment

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to apply appropriate methods to validate and verify ambient monitoring data	<ul style="list-style-type: none"> <li>• Understand agency goals and regulatory issues</li> <li>• Familiarity with analysis methods, QC requirements, modes of failure, statistical tools, and use of external data for validation</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> <li>• APTI SI-474 [Introduction to Environmental Statistics]</li> </ul>	
Ability to design and carry out programmatic and analytical QA/QC methods, protocols, and plans	<ul style="list-style-type: none"> <li>• Advanced knowledge of QA/QC principles and procedures, federal and state regulations, and statistical analysis methods</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> </ul>	<b>High</b>
Ability to design, implement, and report on special monitoring studies	<ul style="list-style-type: none"> <li>• ET – Knowledge of special monitoring methods and procedures</li> <li>• ES – Advanced knowledge of study design and data analyses</li> <li>• ES – Advanced knowledge of current scientific ambient air pollution issues, including new criteria air pollutants and air toxics</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> <li>• APTI SI-474 [Introduction to Environmental Statistics]</li> </ul>	<b>High</b>
Ability to develop presentations and present data analyses, monitoring network updates and changes to internal agency management, state regulatory entities, scientific community, and the general public at any public hearings	<ul style="list-style-type: none"> <li>• Advanced knowledge and understanding of ambient air pollution and related state and federal regulations</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 435 [Atmospheric Sampling]</li> <li>• APTI SI-471 [General Quality Assurance Consideration for Ambient Air Monitoring]</li> <li>• APTI 470 [Quality Assurance for Air Pollution Measurement Systems]</li> <li>• APTI 464 [Analytical Methods for Air Quality Standards]</li> </ul>	<b>High</b>

\* ES = Engineer or Scientist; ET = Environmental Technician

## EMISSION INVENTORIES

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to determine types of emission sources that must submit emission inventories and the intervals for submittal	<ul style="list-style-type: none"> <li>• Understanding of which permits require the submittal of an emission inventory and the regulatory authority for the inventory submittal</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> </ul>	<b>High</b>
Ability to determine how pollutants are regulated and how fees should be assessed	<ul style="list-style-type: none"> <li>• Knowledge of federal and state Regulated Pollutants, precursors and pollutants that may be regulated dually (for example methanol is a HAP and VOC)</li> <li>• Knowledge to ensure that dually regulated pollutants are not double counted for fee purposes</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 452 [Principles and Practices of Air Pollution]</li> </ul>	<b>High</b>
Ability to interpret agency guidelines regarding the use of emission factors for different purposes (annual inventories, permitting, compliance assessment, etc.)	<ul style="list-style-type: none"> <li>• Basis knowledge of agency guidelines for the use of emission factors for different purposes (annual inventories, permitting, compliance assessment, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-460 [Introduction to Permitting]</li> <li>• CARB 335 [Principles of Environmental Compliance &amp; Enforcement]</li> </ul>	<b>High</b>
Ability to (1) review and find credible emission factors for various emission sources; and (2) evaluate the use of emission factors by simple industrial sources (i.e., boilers, ICE, etc.)	<ul style="list-style-type: none"> <li>• Basic knowledge and understanding of the limitations of emission factors (such as those found in AP-42 or FIRE)</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> </ul>	<b>High</b>
Ability to review emissions calculations for accuracy and validity of technical basis for simple emission sources	<ul style="list-style-type: none"> <li>• Understanding of emissions calculations concepts and the ability to use data for development of actual and potential emission calculations.: For example:                             <ul style="list-style-type: none"> <li>○ AP-42</li> <li>○ EPA's Tanks Program</li> <li>○ EPA's WATER9 Program</li> <li>○ Material Balance</li> <li>○ CEMS</li> <li>○ Source Testing Emissions Factors</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> </ul>	<b>High</b>



## EMISSION INVENTORIES

**LEVEL 2** – Intermediate/Advanced – 3 or more years of emissions inventory experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to be a resource for junior staff on emissions inventory issues	<ul style="list-style-type: none"> <li>• Understand the limitations for the use of emission factors</li> <li>• Mentor junior staff on the use of emission factors</li> <li>• Challenge junior staff to validate the use of emission factors when there is uncertainty</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> </ul>	<b>High</b>
Ability to review and interpret more complex inventory submittals (complex Title V sources)	<ul style="list-style-type: none"> <li>• Understanding of emissions calculations concepts and the ability to use data for development of actual and potential emission calculations</li> <li>• Knowledge to perform more advanced and complex calculations associated with approaches that are used to calculate dually regulated pollutants but excludes double counting</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> <li>• CARB 230-233, 243-246, 261, 287-288 [Industry Specific Courses]</li> </ul>	<b>High</b>
Ability to review source test results and interpret or determine the methods for developing source specific emission factors from such data	<ul style="list-style-type: none"> <li>• Knowledge to understand and perform more advanced and complex calculations associated with source test results</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 450 [Source Sampling for Pollutants]</li> <li>• APTI SI 303 [Chain of Custody]</li> </ul>	<b>Low</b> Gap filling available via <a href="#">MARAMA</a> course Emission Calculations & Data Reduction
Ability to gather site-specific or area-specific (i.e., county level) activity data and accurately use the data to develop a credible approach to estimating emissions	<ul style="list-style-type: none"> <li>• Understand how to use activity data in conjunction with existing emission factors and other inputs to accurately estimate emissions.</li> </ul>	None available from existing suite of APTI and CARB courses	<b>Low</b> Gap filling not available

## EMISSION INVENTORIES

**LEVEL 2** – Intermediate/Advanced – 3 or more years of emissions inventory experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability to prepare estimates of mobile source emissions using models such as MOVES and NONROAD</p>	<ul style="list-style-type: none"> <li>• Understanding how to use approved models</li> <li>• Understanding where to obtain up to date input information to use with models</li> <li>• Understanding of the relative importance of various factors in terms of their influence on model performance</li> </ul>	<p>None available from existing suite of APTI and CARB courses</p>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via courses in a public venue. Options include:  <u>Motor Vehicle Emissions Simulator</u> offered by the Federal Highway Administration</p>
<p>Ability to comply with federal, state, and/or local requirements for developing and maintaining data bases of emissions data</p>	<ul style="list-style-type: none"> <li>• Knowledge of federal/state/local requirements and guidance</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> </ul>	<p style="text-align: center;"><b>High</b></p>

## MODELING, FORECASTING, & DATA ANALYSIS

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to interpret the introductory basic sciences found in the study of atmospheric science, meteorology, air quality science and modeling of emission sources	<ul style="list-style-type: none"> <li>• Basic understanding of the math and scientific concepts associated with dispersion modeling</li> </ul>	<ul style="list-style-type: none"> <li>• APTI OS-411A [Series 411 - Computational Atmospheric Sciences: Essential Atmospheric Sciences]</li> <li>• APTI OS-411B [Series 411 - Computational Atmospheric Sciences: Essential Atmospheric Sciences]</li> <li>• APTI OS-411C [Series 411 - Computational Atmospheric Sciences: Meteorology for Air Quality Monitoring]</li> <li>• APTI SI-409 [Basic Air Pollution Meteorology]</li> <li>• APTI 424 [Introduction to Receptor Modeling]</li> </ul>	<b>High</b>
Ability to determine how to use air pollution meteorology, chemistry to include tropospheric chemistry, and the use of computer modeling tools and their limitations	<ul style="list-style-type: none"> <li>• Basic knowledge of the tools that are needed to conduct dispersion modeling</li> </ul>	<ul style="list-style-type: none"> <li>• APTI OS-411D [Series 411 - Computational Atmospheric Sciences: Tropospheric Chemistry for Air Quality Modeling]</li> <li>• APTI OS-411E [Series 411 - Computational Atmospheric Sciences: Computational Science ]</li> </ul>	<b>High</b>
Ability to utilize the model for selected simple applications	<ul style="list-style-type: none"> <li>• Basic knowledge of how to setup and run the model for selected simple applications</li> </ul>	<ul style="list-style-type: none"> <li>• APTI OS-411F [Series 411 - Computational Atmospheric Sciences: Atmospheric Science Models]</li> </ul>	<b>High</b>
Ability to analyze simple dispersion modeling analyses that are submitted with air permit applications	<ul style="list-style-type: none"> <li>• Basic knowledge to ensure modeling protocols are followed, proper meteorological data was used, setup of facility data was accurate, and that input and output files are correct</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-410 [Introduction to Dispersion Modeling ]</li> <li>• APTI 423 [Air Pollution Dispersion Models - Applications]</li> </ul>	<b>High</b>

## MODELING, FORECASTING, & DATA ANALYSIS

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
	<ul style="list-style-type: none"> <li>• Basic understanding to run model to QA/QC application results</li> </ul>		
Ability to assist senior staff with modeling simple sources for SIP and state-only air planning purposes	<ul style="list-style-type: none"> <li>• Basic knowledge of how to setup and run the model to assist in air quality planning purposes</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-410 [Introduction to Dispersion Modeling ]</li> <li>• APTI 423 [Air Pollution Dispersion Models - Applications]</li> </ul>	<b>High</b>
Ability to assist senior modeling staff in forecasting air pollution events, such as daily ozone forecasting	<ul style="list-style-type: none"> <li>• Basic knowledge of how to setup and run the model to assist with air pollution forecasting as needed by the agency</li> </ul>	None available from existing suite of APTI and CARB courses	<b>Low</b>

## MODELING, FORECASTING, & DATA ANALYSIS

**LEVEL 2** – Intermediate/Advanced – 3 or more years of permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to utilize the model for selected complex applications as requested by agency management	<ul style="list-style-type: none"> <li>Advanced knowledge of how to setup and run the model for complex applications</li> </ul>	<ul style="list-style-type: none"> <li>APTI 423 [Air Pollution Dispersion Models - Applications]</li> </ul>	<b>High</b>
Ability to analyze complex dispersion modeling analyses that are submitted with air permit applications (e.g., PSD modeling, which may include multisource modeling; complex air toxics modeling; residual risk modeling)	<ul style="list-style-type: none"> <li>Advanced knowledge to ensure modeling protocols are followed, proper meteorological data was used, setup of facility data was accurate, and that input and output files are correct</li> <li>Advanced understanding to run complex models to QA/QC application results</li> </ul>	<ul style="list-style-type: none"> <li>APTI 423 [Air Pollution Dispersion Models - Applications]</li> </ul>	<b>High</b>
Ability to model complex sources and situations for SIP and state-only air planning purposes	<ul style="list-style-type: none"> <li>Advanced knowledge of how to setup and run the model to provide results for air quality planning purposes</li> </ul>	<ul style="list-style-type: none"> <li>APTI 423 [Air Pollution Dispersion Models - Applications]</li> </ul>	<b>High</b>
Ability to analyze air pollution/ambient situations to forecast air pollution events, such as daily ozone forecasting	<ul style="list-style-type: none"> <li>Advanced knowledge of how to setup and run the model to provide air pollution forecasting as needed by the agency</li> </ul>	None available from existing suite of APTI and CARB courses	<b>Low</b>
Ability (1) to mentor junior staff and (2) provide oversight and be a resource for complex modeling issues	<ul style="list-style-type: none"> <li>Knowledge to perform more advanced and complex oversight of the dispersion modeling process</li> </ul>	<ul style="list-style-type: none"> <li>APTI 423 [Air Pollution Dispersion Models - Applications]</li> </ul>	<b>High</b>
Ability to implement receptor modeling as a part of some air quality management	<ul style="list-style-type: none"> <li>Background and application of receptor models for the source identification and quantitative mass apportionment of airborne pollutants</li> </ul>	<ul style="list-style-type: none"> <li>APTI 424 [Introduction to Receptor Modeling]</li> </ul>	<b>High</b>

## MODELING, FORECASTING, & DATA ANALYSIS

**LEVEL 2** – Intermediate/Advanced – 3 or more years of permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability to apply models in complex situations where there is a need to make assumptions about how to set up the modeling platform in order to best represent specific complex situations</p> <p>Ability to explain the rationale for these decisions to decision makers</p>	<ul style="list-style-type: none"> <li>• Thorough understanding of model assumptions and options for input data</li> <li>• Knowledge of prior decisions by regulatory agencies to approve specific applications of models</li> <li>• Knowledge of applicable regulations and guidance.</li> <li>• Knowledge of scientific basis for model assumptions and data for particular situations that would determine the best application of the model</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 423 [Air Pollution Dispersion Models - Applications]</li> <li>• APTI SI-409 [Basic Air Pollution Meteorology]</li> <li>• APTI 424 [Introduction to Receptor Modeling]</li> </ul>	<p><b>High</b></p>

## PLANNING AND REGULATION DEVELOPMENT

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to identify types of emission sources that affect air quality and the underlying reasons they must be addressed in air quality planning and regulation development	<ul style="list-style-type: none"> <li>Understanding of which emission sources affect air quality in the region of interest and what regulatory requirements already exist to limit emissions from those sources</li> </ul>	<ul style="list-style-type: none"> <li>APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>APTI-SI-422 [Air Pollution Control Orientation Course]</li> <li>APTI SI-460 [Introduction to Permitting]</li> <li>CARB – 101 [Uniform Air Quality Training Program ]</li> <li>APTI 452 [Principles and Practices of Air Pollution ]</li> </ul>	<b>High</b>
Ability to determine and differentiate the compliance concepts of the federal, state and local general statutes, laws, rules and regulations	<ul style="list-style-type: none"> <li>Understand the goals of the agency and the underlying laws, rules and regulations from which regulations must be developed</li> </ul>	<ul style="list-style-type: none"> <li>APTI-SI-422 [Air Pollution Control Orientation Course]</li> <li>CARB – 101 [Uniform Air Quality Training Program ]</li> <li>APTI 452 [Principles and Practices of Air Pollution ]</li> </ul>	<b>High</b>  Local/state requirements need to be covered separately, not in EPA courses
Ability to differentiate between the requirements for ambient standards and the requirements for emission standards	<ul style="list-style-type: none"> <li>Understand the reasons for the need to have both ambient standards as well as specific emission standards for various emission sources</li> </ul>	<ul style="list-style-type: none"> <li>CARB – 101 [Uniform Air Quality Training Program ]</li> <li>APTI 452 [Principles and Practices of Air Pollution ]</li> </ul>	<b>High</b>
Ability to identify goals for state regulations and federal SIP and other federal regulations	<ul style="list-style-type: none"> <li>Basic knowledge of underlying state laws or regulations that allow the development of state standards</li> <li>Basic knowledge of regulatory requirements that allow and require the adoption of federal standards</li> </ul>	<ul style="list-style-type: none"> <li>APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>APTI On-Demand Videos [EPA Clean Air Act Training Modules 1-11]</li> </ul>	<b>High</b>  Local/state requirements need to be covered separately, not in EPA courses
Ability to identify which federal regulations must be adopted into the SIP	<ul style="list-style-type: none"> <li>Basic knowledge of the rule adoption procedures for incorporating federal regulations and requirements into state requirements</li> </ul>	<ul style="list-style-type: none"> <li>APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> </ul>	<b>High</b>

## PLANNING AND REGULATION DEVELOPMENT

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
		<ul style="list-style-type: none"> <li>• APTI On-Demand Videos [SIP Law &amp; Rulemaking on State Implementation Plans]</li> </ul>	
<p>Ability to review new simple federal regulations (e.g., new NSPS and NESHAP) and determine the need to incorporate the federal regulations into the state and local regulations</p>	<ul style="list-style-type: none"> <li>• Basic knowledge of which rules must be included in the state and local regulations and the state procedures for rule development</li> </ul>	<ul style="list-style-type: none"> <li>• CARB 290 [MACT General Background Information</li> <li>• APTI On-Demand Videos [SIP Law &amp; Rulemaking on State Implementation Plans]</li> </ul>	<p style="text-align: center;"><b>High</b></p> <p>State/local agencies may offer training</p>
<p>Ability to draft simple regulations and supporting documentation for incorporation of new state or federal rules into the state regulations</p>	<ul style="list-style-type: none"> <li>• Knowledge of regulation development and procedures for developing new regulations</li> </ul>	<p>None available from existing suite of APTI and CARB courses</p>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via course in public venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>OECA Regulatory Development Training Course</u> offered by National Environmental Training Institute</li> <li>• State/local agencies may offer training</li> </ul>



## PLANNING AND REGULATION DEVELOPMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of planning and regulation development experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to recognize the need for a state or local regulation or ordinance based on air quality needs or Clean Air Act requirements	<ul style="list-style-type: none"> <li>• Up to date information about new developments in federal and state laws, regulations, and guidance pertaining to air quality management</li> <li>• Knowledge of emissions inventory information and control cost/benefit information pertinent to rule development</li> <li>• Knowledge of health effects and exposure to pollutants in the area of interest</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 452 [Principles and Practices of Air Pollution ]</li> <li>• APTI 461 [Intermediate Permitting]</li> <li>• APTI SI-300 [Introduction to Air Pollution Toxicology]</li> </ul>	<p><b>High</b></p> <p>CARB and/or APTI should be investigated. NACAA, regional organizations and EPA may have webinars or workshops</p>
Ability to determine the permitting and compliance concepts of the federal, state and local general statutes, laws, rules and regulations	<ul style="list-style-type: none"> <li>• Understand and implement the planning goals of the agency</li> <li>• Understand the underlying laws, rules and regulations from which regulations must be developed</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 452 [Principles and Practices of Air Pollution ]</li> <li>• APTI 461 [Intermediate Permitting]</li> </ul>	<p><b>High</b></p> <p>State/local agencies may offer training</p>
Ability to determine whether new regulations must be developed as state-only regulations or federal SIP and other federal regulations	<ul style="list-style-type: none"> <li>• Knowledge of underlying state laws or regulations that allow the development of state standards</li> <li>• Knowledge of regulatory requirements that allow and required the adoption of federal standards</li> </ul>	<ul style="list-style-type: none"> <li>• APTI On-Demand Videos [SIP Law &amp; Rulemaking on State Implementation Plans]</li> <li>• APTI On-Demand Videos [Sanctions, FIPs, and SIP Calls Under the CAA]</li> <li>• APTI On-Demand Videos [Proposed “SIP Fix” Rulemaking for PSD Permitting for GHG Emissions ]</li> <li>• APTI On-Demand Videos [How Can We Help: Recent EPA Efforts to Help States Deal with SIPs]</li> <li>• APTI On-Demand Videos [Air Quality Planning for New NAA]</li> <li>• APTI On-Demand Videos [ Air Quality Data &amp; Tools for Ozone Season &amp; Beyond]</li> </ul>	<p><b>Low</b></p> <p>State/local agencies may offer training</p>

## PLANNING AND REGULATION DEVELOPMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of planning and regulation development experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability to determine which federal regulations must be adopted into the SIP</p>	<ul style="list-style-type: none"> <li>• Knowledge of the rule adoption procedures for incorporating federal regulations</li> <li>• Knowledge of the guidance for demonstrating that state/local rules are equivalent to federal rules</li> </ul>	<ul style="list-style-type: none"> <li>• APTI On-Demand Videos [SIP Law &amp; Rulemaking on State Implementation Plans]</li> <li>• APTI On-Demand Videos [Sanctions, FIPs, and SIP Calls Under the CAA]</li> <li>• APTI On-Demand Videos [Proposed “SIP Fix” Rulemaking for PSD Permitting for GHG Emissions ]</li> <li>• APTI On-Demand Videos [How Can We Help: Recent EPA Efforts to Help States Deal with SIPs]</li> <li>• APTI On-Demand Videos [Air Quality Planning for New NAA]</li> <li>• APTI On-Demand Videos [ Air Quality Data &amp; Tools for Ozone Season &amp; Beyond]</li> </ul>	<p style="text-align: center;"><b>Low</b></p> <p>State/local agencies may offer training</p>
<p>Ability to review new complex federal regulations (e.g., nonattainment regulation updates, CSAPR, etc.) and determine the need and approach to incorporate the federal regulations into the state and local regulations</p>	<ul style="list-style-type: none"> <li>• Basic knowledge of which rules must be included in the state and local regulations and the state procedures for rule development</li> </ul>	<ul style="list-style-type: none"> <li>• APTI On-Demand Videos [SIP Law &amp; Rulemaking on State Implementation Plans]</li> <li>• APTI On-Demand Videos [Sanctions, FIPs, and SIP Calls Under the CAA]</li> <li>• APTI On-Demand Videos [Proposed “SIP Fix” Rulemaking for PSD Permitting for GHG Emissions ]</li> <li>• APTI On-Demand Videos [How Can We Help: Recent EPA Efforts to Help States Deal with SIPs]</li> <li>• APTI On-Demand Videos [Air Quality Planning for New NAA]</li> </ul>	<p style="text-align: center;"><b>Low</b></p> <p>State/local agencies may offer training</p>

## PLANNING AND REGULATION DEVELOPMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of planning and regulation development experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
		<ul style="list-style-type: none"> <li>• APTI On-Demand Videos [ Air Quality Data &amp; Tools for Ozone Season &amp; Beyond]</li> </ul>	
Ability to draft complex regulations and supporting documentation for incorporation of new state or federal rules into the state regulations	<ul style="list-style-type: none"> <li>• Knowledge of regulation development and procedures for developing new regulations</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via course in public venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>OECA Regulatory Development Training Course</u> (NETI MLS902) offered by National Environmental Training Institute</li> </ul>
Ability to develop presentations and present regulatory updates and changes to internal agency management, state regulatory approval commissions, and the general public at any public hearings	<ul style="list-style-type: none"> <li>• Advanced knowledge of the regulatory development process</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via course in public venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>OECA Regulatory Development Training Course</u> (NETI MLS902) offered by National Environmental Training Institute</li> <li>• <u>Risk Communication Course</u> - Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public Involvement</li> </ul>

## PLANNING AND REGULATION DEVELOPMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of planning and regulation development experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability (1) to instruct junior staff and (2) review regulatory data for accuracy and validity for development of updated regulations</p>	<ul style="list-style-type: none"> <li>• Knowledge to perform more advanced and complex oversight of the rule development process</li> </ul>	<p>None available from existing suite of APTI and CARB courses</p>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via course in public venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>OECA Regulatory Development Training Course</u> (NETI MLS902) offered by National Environmental Training Institute</li> <li>• <u>Risk Communication Course</u> - Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public</li> </ul>

## PERMIT WRITING

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to determine types of emission sources that must be included in an air permit	<ul style="list-style-type: none"> <li>• Understanding of which emission sources require a permit and which are exempt from permitting or are considered insignificant sources</li> </ul>	<ul style="list-style-type: none"> <li>• APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• APTI SI-460 [Introduction to Permitting]</li> </ul>	<b>High</b>
Ability to determine how pollutants are regulated	<ul style="list-style-type: none"> <li>• Knowledge of federal and state Regulated Pollutants, precursors and pollutants that may be regulated dually (for example methanol is a HAP and VOC)</li> </ul>	<ul style="list-style-type: none"> <li>• APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• APTI SI-460 [Introduction to Permitting]</li> </ul>	<b>High</b>
Ability to determine the type of permit required by an applicant	<ul style="list-style-type: none"> <li>• Understand differences in permits                             <ul style="list-style-type: none"> <li>○ PSD</li> <li>○ NNSR</li> <li>○ Minor NSR</li> <li>○ State Construction (Minor NSR)</li> <li>○ Small or Area / Non-Title V</li> <li>○ Synthetic Minor / Non-Title V</li> <li>○ Title V</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• APTI SI-460 [Introduction to Permitting]</li> </ul>	<b>High</b>

## PERMIT WRITING

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to utilize the CAA, state and local laws to review and interpret regulations for source applicability purposes	<ul style="list-style-type: none"> <li>• Knowledge of underlying laws that implement federal, state and local permitting</li> <li>• Knowledge of regulatory requirements derived from various air quality rule:               <ul style="list-style-type: none"> <li>○ SIP</li> <li>○ NSPS</li> <li>○ NESHAP</li> <li>○ PSD (basic applicability)</li> <li>○ NNSR (basic applicability)</li> <li>○ Title V/CAM</li> <li>○ State only (air toxics, odor)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• APTI SI-460 [Introduction to Permitting]</li> <li>• CARB 220 [Compliance Assurance Monitoring (CAM)]</li> <li>• CARB 290 [MACT General Background Information]</li> </ul>	<b>High</b>
Ability to review emissions calculations for accuracy and validity of technical basis	<ul style="list-style-type: none"> <li>• Understanding of emissions calculations concepts and the ability to use data for development of potential emission calculations. For example:               <ul style="list-style-type: none"> <li>○ AP-42</li> <li>○ EPA's Tanks Program</li> <li>○ EPA's WATER9 Program</li> <li>○ Material Balance</li> <li>○ Source Testing Emissions Factors</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> </ul>	<b>High</b>
Ability to draft minor source construction permits, non -Title V operating permits and simple Title V permits from applicable rules	<ul style="list-style-type: none"> <li>• Knowledge to draft enforceable permit conditions which incorporate               <ul style="list-style-type: none"> <li>○ Applicable federal and state regulations</li> <li>○ Applicable emission limits/standards</li> <li>○ Applicable operating limits/standards</li> <li>○ Applicable testing requirements</li> <li>○ Applicable monitoring</li> <li>○ Applicable recordkeeping</li> <li>○ Applicable state or local specific general conditions reporting</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-460 [Introduction to Permitting]</li> <li>• APTI 454 [Effective Permit Writing]</li> </ul>	<b>High</b>

## PERMIT WRITING

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to review control technology performance relative to regulatory specifications	<ul style="list-style-type: none"> <li>• Gaseous air control device operations and key elements affecting performance</li> <li>• Particulate control device operations and key elements affecting performance</li> <li>• Work practice standards for air emissions control and key elements affecting effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• APTI-RE-100-6 [Basic Concepts in Environmental Sciences – Module 6: Air Pollution and Control Techniques</li> <li>• APTI 345 [Emission Capture and Gas Handling System Inspection (1995)]</li> <li>• APTI SI-412A,B or C Fabric Filter, ESP and Wet Scrubber</li> <li>• APTI-413 – Control of Particulate</li> <li>• APTI 415 – Control of Gaseous Emissions</li> <li>• APTI-418 – Control of Nitrogen Oxide Emissions</li> <li>• CARB 281 –ESP</li> <li>• CARB 282 – Baghouses</li> <li>• CARB 284-VOC Control Devices</li> <li>• CARB 285- Landfill Gas Control Facilities</li> <li>• SI 417 [Controlling VOC Emission from Leaking Process Equipment</li> <li>• APTI 482 [Source &amp; Control Volatile Organic Air Pollutants]</li> </ul>	<b>High</b>
Ability to review AQ dispersion modeling input data for accuracy and interpret AQ modeling results	<ul style="list-style-type: none"> <li>• Understand the need for accurate input data and apply the results for permitting actions</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-410 [Introduction to Dispersion Modeling ]</li> <li>• APTI 423 [Air Pollution Dispersion Models - Applications]</li> </ul>	<b>High</b>
Ability to develop technical memoranda documenting permit application review and communicate with public, facilities, etc.	<ul style="list-style-type: none"> <li>• How to identify key assumptions underlying permit conditions, write a concise memo</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 454 [Effective Permit Writing]</li> <li>• CARB 333 [Permit Writing I]</li> </ul>	<b>High</b>

## PERMIT WRITING

**LEVEL 2** – Intermediate/Advanced – 3 or more years of permit writing or inspection experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to determine the type of permit	<ul style="list-style-type: none"> <li>• Understand differences in permits                             <ul style="list-style-type: none"> <li>○ PSD</li> <li>○ NNSR</li> <li>○ Minor NSR</li> <li>○ State Construction (Minor NSR)</li> <li>○ Small or Area / Non-Title V</li> <li>○ Synthetic Minor / Non-Title V</li> <li>○ Title V</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 454 [Effective Permit Writing]</li> <li>• APTI 461 [Intermediate Permitting]</li> <li>• CARB 334 [Permit Writing II]</li> </ul>	<b>High</b>
Ability to review and interpret more complex regulations for source applicability purposes	<ul style="list-style-type: none"> <li>• Detailed understanding of the following regulations                             <ul style="list-style-type: none"> <li>○ SIP</li> <li>○ NSPS</li> <li>○ NESHAP</li> <li>○ CAM</li> <li>○ PSD</li> <li>○ NNSR</li> <li>○ Tailoring Rule</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 454 [Effective Permit Writing]</li> <li>• APTI 461 [Intermediate Permitting]</li> <li>• CARB 334 [Permit Writing II]</li> <li>• CARB 220 [Compliance Assurance Monitoring (CAM)]</li> <li>• APTI On-Demand Videos [Greenhouse Gas Permit Training]</li> </ul>	<b>High</b>
Ability (1) to instruct junior staff and (2) review emissions calculations for accuracy and validity of technical basis for more complex emission calculations	<ul style="list-style-type: none"> <li>• Knowledge to perform more advanced and complex calculations associated with PSD, NSR NAA, NESHAP and NSPS</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 454 [Effective Permit Writing]</li> <li>• APTI 461 [Intermediate Permitting]</li> <li>• CARB 334 [Permit Writing II]</li> </ul>	<b>High</b>
Ability to conduct advanced technical analyses as required in the PSD regulations and NSR NAA regulations	<ul style="list-style-type: none"> <li>• Understand and conduct top-down BACT analysis</li> <li>• Understand and conduct a PSD netting analysis</li> <li>• Understand and conduct an emissions offset analysis</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 454 [Effective Permit Writing]</li> <li>• APTI 461 [Intermediate Permitting]</li> </ul>	<b>Medium</b> Deficiency noted in advanced NSR/PSD analyses. Gap filling available via private venue courses.



## PERMIT WRITING

**LEVEL 2** – Intermediate/Advanced – 3 or more years of permit writing or inspection experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
		<ul style="list-style-type: none"> <li>• CARB 334 [Permit Writing II]</li> <li>• APTI Webinars [PSD and Title V GHG]</li> </ul>	Options include: <ul style="list-style-type: none"> <li>• <u>Fundamentals of NSR/PSD Permitting [EMGM-382]</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>NSR/PSD Workshop and BACT Determination Workshop</u> offered by RTP Environmental Associates</li> <li>• <u>NSR/PSD Workshop</u> offered by Trinity Consultants</li> </ul>
Ability to draft major source (PSD, NSR/NAA) construction permits and complex Title V permits from applicable rules	<ul style="list-style-type: none"> <li>• Knowledge to draft enforceable permit conditions which incorporate               <ul style="list-style-type: none"> <li>○ Applicable federal and state regulations.</li> <li>○ Applicable emission limits/standards</li> <li>○ Applicable operating limits/standards</li> <li>○ Applicable testing requirements</li> <li>○ Applicable monitoring</li> <li>○ Applicable recordkeeping</li> <li>○ Applicable state or local specific general conditions reporting</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 454 [Effective Permit Writing]</li> <li>• APTI 461 [Intermediate Permitting]</li> <li>• CARB 334 [Permit Writing II]</li> </ul>	<b>High</b>
Ability to review control technology performance relative to regulatory specifications	<ul style="list-style-type: none"> <li>• Detailed understanding of specific gaseous air control device operations and key elements affecting performance</li> <li>• Detailed understanding of specific particulate control device operations and key elements affecting performance</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-428A [Introduction to Boiler Operations]</li> <li>• APTI SI-431 [Air Pollution Control Systems for Selected Industries]</li> <li>• CARB 270 [Incinerators]</li> </ul>	<b>High</b>

## PERMIT WRITING

**LEVEL 2** – Intermediate/Advanced – 3 or more years of permit writing or inspection experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
		<ul style="list-style-type: none"> <li>• CARB 271 [Stationary Reciprocating Engines]</li> <li>• CARB 272 [Stationary Gas Turbines]</li> <li>• CARB 273 [Industrial Boilers]</li> <li>• CARB 230-233, 243-246, 261, 287-288 [Industry Specific Courses]</li> </ul>	
Ability to interpret AQ modeling results	<ul style="list-style-type: none"> <li>• Detailed understanding of the modeling results and use for permitting actions</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 423 [Air Pollution Dispersion Models – Applications]</li> </ul>	<p style="text-align: center;"><b>Medium</b></p> <p>Deficiency noted in advanced NSR/PSD analyses. Gap filling available via private venue courses. Options include:</p> <ul style="list-style-type: none"> <li>• <u>EMGM-382: Fundamentals of NSR/PSD Permitting</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>NSR/PSD Workshop</u> offered by RTP Environmental Associates</li> <li>• <u>NSR/PSD Workshop</u> offered by Trinity Consultants</li> </ul>
Ability to evaluate and interpret other air quality rules	<ul style="list-style-type: none"> <li>• Basic understanding of Risk Management Program requirements</li> <li>• Basic understanding of Ozone Depleting Substance requirements</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via private venue courses.</p>

## PERMIT WRITING

**LEVEL 2** – Intermediate/Advanced – 3 or more years of permit writing or inspection experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
	<ul style="list-style-type: none"> <li>• Basic understanding of Regional Haze Program requirements</li> </ul>		<p>Options include:</p> <ul style="list-style-type: none"> <li>• <u>EMGM-177: Risk Management Planning: A Technical Review</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-255: Introduction to Visibility Concepts</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-141: Overview of Ozone Depleting Substance Regulations</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>Compliance Workshop for Ozone Depleting Substances</u> offered by Trinity Consultants</li> <li>• <u>Risk Management Program</u> offered by RTP Environmental Associates</li> </ul>

## INSPECTION AND ENFORCEMENT

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to determine types of emission sources that must be included in an air permit and those that can be excluded from permitting	<ul style="list-style-type: none"> <li>• Understanding of which emission sources require a permit and which are exempt from permitting or are considered insignificant source</li> </ul>	<ul style="list-style-type: none"> <li>• APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• APTI RE-100-5 [Basic Concepts in Environmental Sciences - Model 5: Flowcharts and Ventilation Systems]</li> <li>• APTI 380 [Fugitive Source Inspection]</li> <li>• APTI 445 [Inspection of Particle Control Devices]</li> <li>• APTI 455 [Inspection of Gas Control Devices and Selected Industries]</li> <li>• CARB 262 [Fugitive VOC Emissions Inspections]</li> </ul>	<b>High</b>
Ability to determine the types of permits needed for emission sources at a manufacturing site	<ul style="list-style-type: none"> <li>• Understand differences in permits               <ul style="list-style-type: none"> <li>○ PSD</li> <li>○ NSR NAA</li> <li>○ Minor NSR</li> <li>○ State Construction (Minor NSR)</li> <li>○ Small or Area / Non-Title V</li> <li>○ Synthetic Minor / Non-Title V</li> <li>○ Title V</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 454 [Effective Permit Writing]</li> <li>• CARB 334 [Permit Writing II]</li> </ul>	<b>High</b>

## INSPECTION AND ENFORCEMENT

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to implement safety procedures while conducting an inspection	<ul style="list-style-type: none"> <li>• Understand important safety items:                             <ul style="list-style-type: none"> <li>○ need for wearing safety equipment (hat, glasses, shoes, etc.)</li> <li>○ requirement to follow plant safety procedures</li> <li>○ hazards associated with industrial process operations</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 446 [Inspection Procedures and Safety]</li> </ul>	<b>High</b>
Ability to inspect simple air emission sources and control devices at non-Title V facilities and simple Title V facilities for proper operation	<ul style="list-style-type: none"> <li>• Understand and be knowledgeable of the operation of emission sources and control devices</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• CARB 350 [Basic Inspector Training ]</li> <li>• APTI 380 [Fugitive Source Inspection]</li> <li>• APTI 445 [Inspection of Particle Control Devices]</li> <li>• APTI 455 [Inspection of Gas Control Devices and Selected Industries]</li> <li>• CARB 262 [Fugitive VOC Emissions Inspections]</li> </ul>	<b>High</b>
Ability to interpret permit conditions while performing a plant inspection and be able to review plant operating data to determine compliance	<ul style="list-style-type: none"> <li>• Understanding the underlying permit conditions and the information required for compliance</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> </ul>	<b>High</b>

## INSPECTION AND ENFORCEMENT

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to review compliance reports, test reports, emission inventories, monitoring data, notifications, etc.	<ul style="list-style-type: none"> <li>• Understanding the required information that is expected in the submittal of any report, including have knowledge of the required information and be able to determine completeness and accuracy of each report</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• CARB 224 [ Observing a Source Test]</li> </ul>	<b>High</b>
<p>Ability to review plant operating data and plant submitted data to determine permit compliance</p> <p>Ability to develop inspection and compliance assessment reports</p>	<ul style="list-style-type: none"> <li>• Knowledge to draft agency inspection reports which document                             <ul style="list-style-type: none"> <li>○ Nature of operations of inspected facility</li> <li>○ Emission sources observed</li> <li>○ Assessment of inspected emission sources (compliance/non-compliance)</li> </ul> </li> <li>• Knowledge to draft agency reports which document                             <ul style="list-style-type: none"> <li>○ Compliance assessment of each submitted report in regards to the permit and any other agency requirements</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 444 [ Air Pollution Field Enforcement]</li> </ul>	<b>High</b>
Ability to determine non-complying facilities and communicate such findings to their supervisors	<ul style="list-style-type: none"> <li>• Basic knowledge of permit and underlying regulations that must be evaluated to determine facility compliance</li> <li>• Basic knowledge of enforcement procedures for non-complying emission sources</li> <li>• Knowledge to document in agency format non-complying issues in accordance with agency procedures</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> </ul>	<b>High</b>
Ability to review test protocols and observe compliance test procedures for simple processes	<ul style="list-style-type: none"> <li>• Knowledge of agency procedures and source test methods for compliance testing</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> </ul>	<b>High</b>

## INSPECTION AND ENFORCEMENT

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
		<ul style="list-style-type: none"> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 450 [Source Sampling for Pollutants]</li> <li>• APTI 468 [Source Test Observations]</li> <li>• CARB 224 [ Observing a Source Test]</li> </ul>	
Ability to meet federal/state/local requirements for maintaining databases concerning inspections and compliance status	<ul style="list-style-type: none"> <li>• Knowledge of federal/state/local requirements for data reporting and maintenance</li> </ul>	None available from existing suite of APTI and CARB courses	<p><b>Low</b></p> <ul style="list-style-type: none"> <li>• Courses not available</li> </ul>

## INSPECTION AND ENFORCEMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of inspection or permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability to determine types of emission sources that must be included in an air permit and those that can be excluded from permitting at a complex manufacturing facility (Title V and Major PSD or NSR-NAA site)</p>	<ul style="list-style-type: none"> <li>• Understanding of which emission sources require a permit and which are exempt from permitting or are considered insignificant sources</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 380 [Fugitive Source Inspection]</li> <li>• APTI 445 [Inspection of Particle Control Devices]</li> <li>• APTI 455 [Inspection of Gas Control Devices and Selected Industries]</li> <li>• CARB 262 [Fugitive VOC Emissions Inspections]</li> <li>• APTI 350 [Asbestos NESHAP Inspection and Safety Procedures Workshop]</li> </ul>	<p><b>High</b></p>
<p>Ability to determine the types of permits needed for emission sources at a complex manufacturing complex (Title V and Major PSD or NSR-NAA site)</p>	<ul style="list-style-type: none"> <li>• Understand differences in permits                             <ul style="list-style-type: none"> <li>○ PSD</li> <li>○ NNSR</li> <li>○ Minor NSR</li> <li>○ State Construction (Minor NSR)</li> <li>○ Small or Area / Non-Title V</li> <li>○ Synthetic Minor / Non-Title V</li> <li>○ Title V</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI RE-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• APTI SI-460 [Introduction to Permitting]</li> <li>• APTI 454 [Effective Permit Writing]</li> <li>• CARB 334 [Permit Writing II]</li> </ul>	<p><b>High</b></p>



## INSPECTION AND ENFORCEMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of inspection or permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

<p>Ability to implement safety procedures while conducting an inspection</p>	<ul style="list-style-type: none"> <li>• Understand:               <ul style="list-style-type: none"> <li>○ the need for wearing safety equipment (hat, glasses, shoes, etc.)</li> <li>○ the need for following plant safety procedures</li> <li>○ the hazards associated with industrial process operations</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 446 [Inspection Procedures and Safety]</li> <li>• CARB 355 [ Advanced Inspector Training]</li> </ul>	<p style="text-align: center;"><b>High</b></p>
<p>Ability to inspect complex air emission sources and control devices at Title V facilities for proper operation</p>	<p>Understand and be knowledgeable of the operation of emission sources and control devices</p>	<ul style="list-style-type: none"> <li>• CARB 355 [ Advanced Inspector Training]</li> <li>• APTI 427 [Combustion evaluation]</li> <li>• Classes on different industrial sources (such as CARB courses)</li> <li>• Control device classes ie, APTI SI 437</li> </ul>	<p style="text-align: center;"><b>Medium</b> <u>Combustion Source Inspection</u> offered by Brian Doyle</p>
<p>Ability to interpret complex permit conditions while performing a plant inspection and be able to review plant operating data to determine compliance</p>	<ul style="list-style-type: none"> <li>• Understanding the underlying permit conditions and the information required for compliance</li> <li>• Understanding of complex federal regulations – NESHAP, NSPS, CAM , PSD, NSR-NAA</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> </ul>	<p style="text-align: center;"><b>Medium</b></p> <p>Deficiency noted in advanced NSR/PSD analyses. Gap filling available via private venue courses.</p> <p>Options include:</p> <ul style="list-style-type: none"> <li>• <u>Fundamentals of NSR/PSD Permitting [EMGM-382]</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>NSR/PSD Workshop</u> offered by RTP Environmental Associates</li> </ul>

## INSPECTION AND ENFORCEMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of inspection or permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

			<ul style="list-style-type: none"> <li>• <u>NSR/PSD Workshop</u> offered by Trinity Consultants</li> </ul>
Ability to review compliance reports, test reports, emission inventories, monitoring data, notifications, etc.	<ul style="list-style-type: none"> <li>• Understanding the required information that is expected in the submittal of any report. Be knowledgeable of the required information and be able to determine completeness and accuracy of each report</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 446 [Inspection Procedures and Safety]</li> </ul>	<b>High</b>
<p>Ability to review plant operating data and plant submitted data and determine permit compliance</p> <p>Ability to develop inspection and compliance assessment reports for complex facilities (Title V sources)</p>	<ul style="list-style-type: none"> <li>• Knowledge to draft agency inspection reports which document                             <ul style="list-style-type: none"> <li>○ Nature of operations of inspected facility</li> <li>○ Emission sources observed</li> <li>○ Assessment of an inspected emission sources (compliance/non-compliance)</li> </ul> </li> <li>• Knowledge to draft agency reports which document                             <ul style="list-style-type: none"> <li>○ Compliance assessment of each submitted report in regards to the permit and any other agency requirements</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 446 [Inspection Procedures and Safety]</li> </ul>	<b>High</b>
Ability to determine non-complying facilities and develop enforcement reports following agency procedures for complex industrial operations (Title V sources)	<ul style="list-style-type: none"> <li>• Knowledge of permit and underlying regulations that must be evaluated to determine facility compliance</li> <li>• Knowledge of enforcement procedures for non-complying emission sources</li> <li>• Knowledge to document in agency format non-complying issues in accordance with agency procedures</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 446 [Inspection Procedures and Safety]</li> </ul>	<b>High</b>

## INSPECTION AND ENFORCEMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of inspection or permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

<p>Ability to evaluate complex sources for applicability to complex regulations in order to determine applicability to and compliance with such regulations</p>	<ul style="list-style-type: none"> <li>• Knowledge to perform more advanced and complex compliance regulatory assessment and calculations associated with PSD, NSR NAA, NESHAP and NSPS</li> </ul>	<ul style="list-style-type: none"> <li>• CARB 334 [Permit Writing II]</li> <li>• APTI SI-460 [Introduction to Permitting]</li> </ul>	<p style="text-align: center;"><b>Medium</b></p> <p>Deficiency noted in advanced NSR/PSD analyses. Gap filling available via private venue courses. Options include:</p> <ul style="list-style-type: none"> <li>• <u>Fundamentals of NSR/PSD Permitting [EMGM-382]</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>NSR/PSD Workshop</u> offered by RTP Environmental Associates</li> <li>• <u>NSR/PSD Workshop</u> offered by Trinity Consultants</li> </ul>
<p>Ability to review test protocols and observe compliance test procedures for complex processes</p>	<ul style="list-style-type: none"> <li>• Knowledge of agency procedures and understanding of source test methods for compliance testing</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 450 [Source Sampling for Pollutants]</li> <li>• APTI 468 [Source Test Observations]</li> <li>• Advanced source testing</li> <li>• Test methods applicability and use</li> </ul>	<p style="text-align: center;"><b>Low</b></p> <p>No gap filling courses identified.</p>
<p>Ability to review CEMS/COMS/CPMS data and determine compliance</p>	<ul style="list-style-type: none"> <li>• Knowledge of regulations and understanding of the CEMS/COMS/CPMS units to assess compliance with regulations</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced source testing</li> <li>• CEMS/COMS/CPMS units operation training</li> <li>• APTI 470 [QA for Air Pollution Measurement Systems]</li> </ul>	<p style="text-align: center;"><b>High</b></p>

## INSPECTION AND ENFORCEMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of inspection or permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

		<ul style="list-style-type: none"> <li>• SI 476B [CEMS – Operation and Maintenance of Gas Monitors</li> <li>• APTI 474 [ Continuous Emission Monitoring]</li> <li>• CARB 221 [ Continuous Emissions Monitoring ]</li> </ul>	
<p>Ability to evaluate and interpret other air quality rules for site inspection purposes</p>	<ul style="list-style-type: none"> <li>• Basic understanding of Risk Management Program requirements</li> <li>• Basic understanding of Ozone Depleting Substance requirements</li> <li>• Basic understanding of Regional Haze Program requirements</li> </ul>	<p>None available from existing suite of APTI and CARB courses</p>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via private venue courses. Options include:</p> <ul style="list-style-type: none"> <li>• <u>EMGM-177: Risk Management Planning: A Technical Review</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-255: Introduction to Visibility Concepts</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-141: Overview of Ozone Depleting Substance Regulations</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>Compliance Workshop for Ozone Depleting Substances</u> offered by Trinity Consultants</li> </ul>

## INSPECTION AND ENFORCEMENT

**LEVEL 2** – Intermediate/Advanced – 3 or more years of inspection or permit writing experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

			<ul style="list-style-type: none"> <li>• <u>Risk Management Program</u> offered by RTP Environmental Associates</li> </ul>
Ability to instruct junior staff on inspection and enforcement expectations and review junior staff compliance and enforcement reports	<ul style="list-style-type: none"> <li>• Knowledge to provide guidance for staff instruction and to perform overview of compliance and enforcement reports</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-445 [Introduction to Baseline Source Inspection Techniques]</li> <li>• APTI SI-446 [Air Pollution Source Inspection]</li> <li>• APTI 446 [Inspection Procedures and Safety]</li> </ul>	<b>High</b>

## AIR TOXICS AND HAZARDOUS AIR POLLUTANTS

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to interpret state-only air toxic rules (if applicable in your state)	<ul style="list-style-type: none"> <li>• Understanding of:                             <ul style="list-style-type: none"> <li>○ rule applicability requirements</li> <li>○ which emission sources require a permit</li> <li>○ which emission sources are exempt from permitting or from the air toxics requirements</li> <li>○ process equipment</li> <li>○ control technologies</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-100-7 [Basic Concepts in Environmental Sciences - Model 7: Regulatory Requirements]</li> <li>• CARB 335 [Principles of Environmental Compliance &amp; Enforcement]</li> <li>• APTI On-Demand Videos – [Understanding Air Toxics]</li> </ul>	<b>High</b>
Ability to understand the basic concepts underlying risk assessment, risk management, and risk communication	<ul style="list-style-type: none"> <li>• General understanding of environmental health, information used in developing health benchmarks, and general assumptions and limitations with those</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-401 [Risk-Based Air Toxics]</li> </ul>	<b>High</b>
Ability to determine how and which pollutants are regulated	<ul style="list-style-type: none"> <li>• Knowledge of the differences in the state-only air toxics pollutants versus the federal HAP pollutants</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>
Ability to determine how state-only air toxics are regulated vs. the federal HAPs	<ul style="list-style-type: none"> <li>• Knowledge of the differences in the state-only air toxics requirements versus any federal HAP requirements, such as 112(d), (g) and (j) and 122 (f) and (k)</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>
Ability to determine the applicable rules for various sources of HAPs	<ul style="list-style-type: none"> <li>• Understand the federal NESHAP requirements to be knowledgeable of:                             <ul style="list-style-type: none"> <li>○ the categorical standards that have been developed for major and area sources</li> <li>○ the categorical standards that are under development for major and area sources</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>

## AIR TOXICS AND HAZARDOUS AIR POLLUTANTS

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to review HAP and TAP emissions calculations for accuracy and validity of technical basis	<ul style="list-style-type: none"> <li>• Understanding of emissions calculations concepts and the ability to use data for development of potential and actual emission calculations. For example:                             <ul style="list-style-type: none"> <li>○ AP-42</li> <li>○ EPA’s Tanks Program</li> <li>○ Material Balance</li> <li>○ Source Testing Emissions Factors</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> </ul>	<b>High</b>
Ability to review control technology performance relative to HAP regulatory specifications	<ul style="list-style-type: none"> <li>• Gaseous air control device operations and key elements affecting performance</li> <li>• Particulate control device operations and key elements affecting performance</li> <li>• Work practice standards for air emissions control and key elements affecting effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• APTI-RE-100-6 [Basic Concepts in Environmental Sciences – Module 6: Air Pollution and Control Techniques]</li> <li>• APTI SI-412B [Electrostatic Precipitator Plan Review]</li> <li>• APTI 345 [Emission Capture and Gas Handling System Inspection (1995)]</li> </ul>	<b>High</b>
Ability to review simple state-only TAP AQ dispersion modeling input data for accuracy and interpret AQ modeling results	<ul style="list-style-type: none"> <li>• Understand the need for accurate input data and apply the results for permitting actions</li> <li>• Understanding of state-only risk determinations based on dispersion modeling when no state or national emission standards are applicable</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-410 [Introduction to Dispersion Modeling]</li> </ul>	<b>High</b>
Ability to interpret basic information for HAP risk data	<ul style="list-style-type: none"> <li>• Understand how risk data is utilized under the current regulatory framework</li> <li>• Understand how risk data is utilized for unregulated HAPs</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>

## AIR TOXICS AND HAZARDOUS AIR POLLUTANTS

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability to develop technical memoranda documenting HAP regulatory information and communicate with public, facilities, etc.</p> <p>Ability to communicate technical information to a wide variety of audiences in a wide variety of situations</p>	<ul style="list-style-type: none"> <li>• Knowledge to write a concise memo</li> <li>• Ability to prepare presentation materials</li> <li>• Ability to present information to internal and external audiences</li> </ul>	<p>None available from existing suite of APTI and CARB courses</p>	<p style="text-align: center;"><b>Low</b></p> <p><u>Risk Communication Course</u> - Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public</p>
<p>Ability to understand national reports on risks from toxic air pollutants, such as EPA's National Air Toxics Assessment (NATA)</p>	<ul style="list-style-type: none"> <li>• Knowledge of EPA's past and current NATA reports and how they pertain to the area of interest (state/locality)</li> <li>• Knowledge of other information that the state or locality may have concerning toxics risks in the community</li> <li>• Knowledge of local interest groups and their concerns regarding the reports</li> <li>• Knowledge of the state or local agency's position on the reports</li> </ul>	<p>None available from existing suite of APTI and CARB courses</p> <ul style="list-style-type: none"> <li>• APTI webinars</li> </ul>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling could not be identified</p>



## AIR TOXICS AND HAZARDOUS AIR POLLUTANTS

**LEVEL 2** – Intermediate/Advanced – 3 or more years of toxics experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to provide senior regulatory background guidance on state-only air toxic rules (if applicable in your state)	<ul style="list-style-type: none"> <li>• Thorough understanding of:                             <ul style="list-style-type: none"> <li>○ rule applicability requirements</li> <li>○ which emission sources require a permit</li> <li>○ which emission sources are exempt from permitting or from the air toxics requirements</li> <li>○ process equipment used in industrial process like condensers, reactors, fans, pumps, process heaters, boilers, evaporators, spray nozzles, etc</li> <li>○ Control technology</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>
Ability to understand the concepts underlying risk assessment, risk management, and risk communication	<ul style="list-style-type: none"> <li>• Understanding the application of risk assessment principles to specific situations, assumptions, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>
Ability to determine the applicable rules for complex sources of HAPs	<ul style="list-style-type: none"> <li>• Understand the federal NESHAP requirements to be knowledgeable of and be a regulatory resource for:                             <ul style="list-style-type: none"> <li>○ the categorical standards that have been developed for major and area sources</li> <li>○ the categorical standards that are under development for major and area sources</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>
Ability (1) to instruct junior staff and (2) review regulatory determinations for accuracy and validity of technical basis for more complex emission sources	<ul style="list-style-type: none"> <li>• Knowledge to mentor junior staff</li> <li>• Knowledge to perform more advanced and regulatory determinations associated with complex NESHAP regulations</li> </ul>	<ul style="list-style-type: none"> <li>• APTI 400 [Introduction to Hazardous Air Pollutants (2009)]</li> </ul>	<b>High</b>
Ability to review complex HAP and TAP emissions calculations for accuracy and validity of technical basis	<ul style="list-style-type: none"> <li>• Understanding of emissions calculations concepts and the ability to use data for development of potential and actual emission calculations.: For example:</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-419A [Introduction to Emission Inventories]</li> <li>• APTI 419B [Preparation of Fine Particulate Emission Inventories]</li> </ul>	<b>High</b>

## AIR TOXICS AND HAZARDOUS AIR POLLUTANTS

**LEVEL 2** – Intermediate/Advanced – 3 or more years of toxics experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
	<ul style="list-style-type: none"> <li>○ AP-42</li> <li>○ EPA’s Tanks Program</li> <li>○ Material Balance</li> <li>○ Source Testing Emissions Factors</li> </ul>		
Ability to review control technology performance relative to HAP regulatory specifications	<ul style="list-style-type: none"> <li>● Gaseous air control device operations and key elements affecting performance</li> <li>● Particulate control device operations and key elements affecting performance</li> <li>● Work practice standards for air emissions control and key elements affecting effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>● APTI RE-100-2 [Basic Concepts in Environmental Sciences - Module 2: Characteristics of Gases]</li> <li>● APTI RE-100-3 [Basic Concepts in Environmental Sciences - Module 3: Characteristics of Particles]</li> <li>● APTI RE-100-4 [Basic Concepts in Environmental Sciences - Module 4: Liquid Characteristics]</li> </ul>	<b>High</b>
Ability to review complex state-only TAP AQ dispersion modeling input data for accuracy and interpret AQ modeling results	<ul style="list-style-type: none"> <li>● Understand the need for accurate input data and apply the results for permitting actions</li> </ul>	<ul style="list-style-type: none"> <li>● APTI SI-410 [Introduction to Dispersion Modeling]</li> </ul>	<b>High</b>
Ability to interpret HAP risk data and understand that basis and data used for conducting a residual risk analysis	<ul style="list-style-type: none"> <li>● Understand how risk data is utilized under the current regulatory framework</li> <li>● Understand the residual risk regulatory review procedures and interpret results</li> </ul>	None available from existing suite of APTI and CARB courses	<b>Low</b> <u>Risk Communication Course</u> - Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public Involvement

## AIR TOXICS AND HAZARDOUS AIR POLLUTANTS

**LEVEL 2** – Intermediate/Advanced – 3 or more years of toxics experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to develop technical memoranda documenting HAP regulatory information and communicate with public, facilities, etc.	<ul style="list-style-type: none"> <li>• Knowledge to identify key assumptions within a rule and write a concise memo</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p><u>Risk Communication Course</u> - Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public Involvement</p>
Ability to evaluate and interpret other air quality rules that may have an effect on TAPs and HAPs	<ul style="list-style-type: none"> <li>• Basic understanding of Risk Management Program requirements</li> <li>• Basic understanding of Ozone Depleting Substance requirements</li> <li>• Basic understanding of Regional Haze Program requirements</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via private venue courses. Options include:</p> <ul style="list-style-type: none"> <li>• <u>EMGM-177: Risk Management Planning: A Technical Review</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-255: Introduction to Visibility Concepts</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>AIR-141: Overview of Ozone Depleting Substance Regulations</u> offered by the Air &amp; Waste Management Association</li> <li>• <u>Risk Management Program</u> offered by RTP Environmental Associates</li> </ul>

## MOBILE SOURCES

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to write and review competitive grant applications for low emitting mobile source engines	<ul style="list-style-type: none"> <li>• Understand and have knowledge of the low emitting mobile source process</li> <li>• Understand and knowledge of mobile sources to recommend grant approval</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> Gap filling available via public venue courses. <ul style="list-style-type: none"> <li>• <u>Mobile Source Emissions Factor Modeling</u> offered by the Federal Highway Administration</li> </ul>
Ability to determine the compliance requirements for mobile sources with regard to federal and state requirements	<ul style="list-style-type: none"> <li>• Understand the regulations and work with the state planning and compliance sections on developing and implementing any required regulations</li> </ul>	None available from existing suite of APTI and CARB courses <ul style="list-style-type: none"> <li>• APTI webinars</li> </ul>	<p style="text-align: center;"><b>Low</b></p> Gap filling available via public venue course: <ul style="list-style-type: none"> <li>• <u>Air Quality Fundamentals</u> offered by the Federal Highway Administration</li> </ul>
Ability to review, determine and implement the state air quality requirements for the I/M and OBD programs	<ul style="list-style-type: none"> <li>• Understand the regulatory requirements and implement these required programs within the required areas of the state</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> Gap filling could not be identified
Ability to develop and implement calculation procedures for estimating mobile source emission within a given area	<ul style="list-style-type: none"> <li>• Knowledge of references and procedures for developing mobile source emissions</li> </ul>	None available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> Gap filling available via courses in a private venue. Options include: <ul style="list-style-type: none"> <li>• <u>Mobile Source Emissions Factor Modeling</u> offered by the Federal Highway Administration</li> <li>• <u>MOVES2010a 2 Day Training</u> offered by Federal Highway Administration</li> <li>• EPA <u>MOVES</u> website</li> </ul>

## MOBILE SOURCES

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability to interpret the transportation conformity requirements from the CAA as required in each state</p>	<ul style="list-style-type: none"> <li>• Knowledge of the requirements so as to implement address the conformity requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Federal transportation conformity and state consultation process</li> </ul>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via courses in a private venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>Introduction to Transportation Conformity</u> offered by the Federal Highway Administration</li> </ul>

## CLIMATE CHANGE

**LEVEL 1** – Beginner – New hire with scientific college degree, new hire with limited work experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
<p>Ability to concisely summarize key concepts of climate change science and their connection to voluntary and regulatory GHG mitigation programs</p>	<ul style="list-style-type: none"> <li>• Carbon cycle and potential relationship between increase atmospheric CO2 concentration and temperature, as well as the relationship between climate change and air quality and public health</li> <li>• Main greenhouse gases and primary emission sources</li> <li>• Global warming potential of main greenhouse gases</li> <li>• Key features of the Kyoto Protocol</li> <li>• Key features of carbon emissions trading</li> <li>• Key climate change impacts on the U.S. and the state/local/regional area of concern</li> </ul>	<p>None currently available in existing suite of APTI and CARB courses</p> <ul style="list-style-type: none"> <li>• APTI On-Demand Videos [Black Carbon Training Modules]</li> <li>• APTI On-Demand Videos [Climate and Air Quality : Application for Air Quality Professionals]</li> </ul>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via courses in a private venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>Introduction to Climate Change</u> offered by the Greenhouse Gas Management Institute</li> <li>• <u>Managing Greenhouse Gas Emissions</u> offered by Trinity Consultants</li> </ul>
<p>Ability to review GHG emissions calculations for validity and accuracy of technical basis</p>	<ul style="list-style-type: none"> <li>• GHG Protocol established by WRI/WBCSD</li> <li>• Sector protocols and data monitoring requirements specified under Mandatory Reporting Rule</li> <li>• GHG inventory protocols and procedures specified under The Climate Registry</li> <li>• GHG Inventory verification (ISO 14064 Part 3)</li> <li>• WebFIRE and AP-42 and other emissions factors</li> </ul>	<p>None currently available in existing suite of APTI and CARB courses</p>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via courses in a private venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>Basics of Organizational GHG Accounting</u> offered by the Greenhouse Gas Management Institute</li> <li>• <u>Fundamentals of Organizational GHG Accounting</u> offered by Trinity Consultants</li> </ul>

## CLIMATE CHANGE

**LEVEL 2** – Intermediate/Advanced – 3 or more years of climate change experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
Ability to review and interpret PSD regulations for applicability to GHG emissions	<ul style="list-style-type: none"> <li>Regulatory requirements derived from the EPA Tailoring Rule- including GHG applicability analysis, NSR impact on non-GHG pollutants, GHG BACT requirements, and PSD requirements for Biomass</li> </ul>	None currently available in existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via courses in a public venue. Options include:</p> <ul style="list-style-type: none"> <li><u>Modular Training on GHG Permitting</u> offered by US EPA New Source Review section</li> </ul>
Ability to review and interpret Title V regulations for applicability to GHG emissions	<ul style="list-style-type: none"> <li>Regulatory requirements derived from the EPA Tailoring Rule – including GHG applicability and requirements for inclusion in Title V permit</li> </ul>	<ul style="list-style-type: none"> <li>APTI On-Demand Videos – [Greenhouse Gas Permit Training ]</li> <li>APTI On-Demand Videos – [Proposed “SIP Fix” Rulemaking for PSD Permitting for GHG Emissions]</li> </ul>	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via courses in a public venue. Options include:</p> <ul style="list-style-type: none"> <li><u>Modular Training on GHG Permitting</u> offered by US EPA New Source Review section</li> </ul>
Ability to review a top-down BACT analysis for GHG	<ul style="list-style-type: none"> <li>Energy efficiency measures for GHG reduction and factors affecting performance</li> <li>Fuel switching options for GHG reduction and factors affecting performance</li> <li>Carbon capture/storage technology and factors affecting performance</li> <li>Potential use of Energy Management Systems (Energy Star EnMS, ISO 50001) as BACT work practice requirement</li> </ul>	None currently available in existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling available via courses in public and private venues. Options include:</p> <ul style="list-style-type: none"> <li><u>Modular Training on GHG Permitting</u> offered by US EPA New Source Review section</li> <li><u>Using Life Cycle Analysis to Reduce Environmental Footprint</u> offered by Trinity Consultants</li> </ul>
Ability to understand proposed and final EPA New Source Performance Standards (NSPS) intended to reduce GHG emissions	<ul style="list-style-type: none"> <li>Knowledge of proposed and final NSPS regulations, including background information found in preambles to the proposed and final rules</li> </ul>	None currently available from existing suite of APTI and CARB courses	<p style="text-align: center;"><b>Low</b></p> <p>Gap filling not yet available but expected to be addressed by US EPA’s New Source Section as</p>

## CLIMATE CHANGE

**LEVEL 2** – Intermediate/Advanced – 3 or more years of climate change experience; equivalent experience within regulatory agency; equivalent environmental consulting or industry experience.

SKILLS	KNOWLEDGE AND UNDERSTANDING	RELEVANT COURSES FOR SKILL DEVELOPMENT	RATING AND COMMENTS
			Agency promulgates GHG requirements under NSPS program.
Ability to identify GHG emissions potential associated with various types of fuel combustion	<ul style="list-style-type: none"> <li>• Knowledge of combustion course operations and factors impacting GHG emissions</li> <li>• Carbon potential of various petroleum fuels</li> <li>• Carbon potential of biomass emissions</li> </ul>	<ul style="list-style-type: none"> <li>• APTI SI-428A [Introduction to Boiler Operations]</li> <li>• CARB 270 [Incinerators]</li> <li>• CARB 271 [Stationary Reciprocating Engines]</li> <li>• CARB 272 [Stationary Gas Turbines]</li> <li>• CARB 273 [Industrial Boilers]</li> </ul>	<p style="text-align: center;"><b>Medium</b></p> <p>Gap filling available via courses in a private venue. Options include:</p> <ul style="list-style-type: none"> <li>• <u>Basics of Organizational GHG Accounting</u> offered by the Greenhouse Gas Management Institute</li> <li>• <u>Fundamentals of Organizational GHG Accounting</u> offered by Trinity Consultants</li> <li>• <u>Managing Greenhouse Gas Emissions</u> offered by Trinity Consultants</li> </ul>



## APPENDIX A: LIST OF PRIVATE / PUBLIC PROVIDERS FOR GAP FILLING

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### RTP Environmental

<http://www.rtpenv.com/services.html>

- New Source Review (NSR)
- Advanced NSR
- Effective Permit Writing
- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- Negotiating Permit Conditions (NSR and Title V)
- Risk Management Planning (RMP)
- BACT Determination Workshop

### Trinity Consultants

<http://www.trinityconsultants.com/Training/>

- NSR/PSD Workshop
- Managing Greenhouse Gas Emissions
- Fundamentals of Organizational GHG Accounting
- Using Life Cycle Analysis to Reduce Environmental Footprint
- Introduction to Air Quality Regulations
- Understanding RMP and PSM Requirements
- Managing Title V Permits
- NSR for Carbon Dioxide and Other Greenhouse Gases
- Compliance Workshop for Ozone Depleting Substances
- Fundamentals of Air Dispersion Modeling
- AERMOD Modeling Computer Laboratory
- Practical Air Dispersion Modeling Workshop
- Industry Specific Courses – See website
- State Specific Permitting Courses – See website

### Federal Highway Administration Resource Center

<http://www.fhwa.dot.gov/resourcecenter/teams/airquality/courses.cfm>

- The Congestion Mitigation and Air Quality (CMAQ) Program: Policy Overview (Webinare)
- Air Quality Benefit Estimation Methodologies for TCM Projects
- Air Quality Fundamentals (AQ 101)
- MOBILE6.2 Webinar
- Project-Level Mobile Source Air Toxics (MSAT) Workshop
- MOVES2010a 2-Day Training
- Transportation Air Quality Dispersion Modeling Workshop
- COMMUTER Model Workshop
- Transportation Conformity 101

### Lakes Environmental Software

<http://www.weblakes.com/training/index.html>

- AERMOD
- CALPUFF

**Doyle Engineering Inc. / Brian W. Doyle**

<http://www.briandoylephd.com/>

- Combustion Source Inspection
- Emissions Calculations
- CAM and Title V Monitoring
- Greenhouse Gases and Climate Change 101

**EnviroTech Solutions / William T. “Jerry” Winberry, Jr.**

- Inspection Techniques for Monitoring Fugitive Volatile Organic Compounds (VOCs) Emissions from Industrial Sources Utilizing Federal Reference Method 21 (Course #380)
- Ambient Air Monitoring For Criteria and Hazardous Air Pollutants (HAPs)(Course #401)
- Instrumental Methods Used for Sampling and Analysis of Ambient Air Particulate Matter (PM-2.5  $\mu$ ) (Course #436)
- Safety and the Agency Inspector (Course #446)
- Stack Sampling for Hazardous Air Pollutants (HAPs) and Radionuclides (Course #450/451)
- Stack Testing/Source Test Observations for Mercury Emissions Workshop (Course #469)
- Quality Assurance/Quality Control (QA/QC) for Ambient Air Monitoring Systems and Networks (Course #470)
- Instrumentation for Source Continuous Emission Monitoring (CEM) For Criteria Pollutants and Hazardous Air Pollutants (HAPs) and Radionuclides (Course #474)
- Quality Assurance /Quality Control (QA/QC) for Stack Continuous Emission Monitors (CEMs) Systems (Course #476)
- Inspection and Monitoring of Landfill Gas Emissions for Agency Inspectors (Course #491)

**Alvin Chun and Arnold Den - US EPA National Center for Risk Communication and Public Involvement**

- Risk Communication Class

**Sonoco Technology**

- Data Validation Workshop