



# NDCEE

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Environment

## Harmonizing Title V, PSD, and Air Emissions Inventories with EPA Mandatory Reporting for Greenhouse Gases at Fort Benning

**Greg Gasperecz, Enviance Inc.**

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# Presentation Outline

- Fort Benning air emissions overview
- Historic perspective of inventories preparation
- Why harmonize with Environmental Protection Agency (EPA) greenhouse gas (GHG) reporting rule?
- The emissions harmonizing process
- Example combustion unit
- Conclusions

# Air Emissions Overview

- Title V Operating Permit
  - New Source Performance Standards (NSPS)
  - Hazardous Air Pollutant (HAP) major source
- Major source under Prevention of Significant Deterioration (PSD)
- EPA GHG mandatory reporting rule
- Executive Order 13514
- Georgia Environmental Protection Division (EPD) emissions inventory (fee determination)
- U.S. Army inventory requirements

# Emissions Inventories Recent History

Inventory	2006	2007	2008	2009	2010 +
Criteria & HAP	Enviance	Contractor (excel)	Contractor (excel)	Contractor (excel)	Enviance
Title V Emission Caps	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Enviance
PSD Significance Thresholds	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Fort Benning Staff (excel)	Enviance
Greenhouse Gas		Enviance TCR Protocol			Enviance EPA Protocol
EO13514 Scope 1 GHG			Enviance CEQ/EPA Protocol	Enviance CEQ/EPA Protocol	Enviance CEQ/EPA Protocol
EO13514 Scope 2 GHG			Enviance CEQ Protocol	Enviance CEQ Protocol	Enviance CEQ Protocol

# Combustion Units Emissions Methods

Inventory	Emission Factor (EF) Source	EF Units of Measure (UOM)	Raw Data Source and UOM	Reporting or Emissions Limit UOM
Criteria & HAP	AP-42	Gas: lb/mm scf Oil: lb/ 1000 gal	Gas: Meter (cscf) Oil: Used (gal) Monthly	Criteria: TPY HAPs: lb/year & TPY
Title V Emission Caps	AP-42	Gas: lb/mm scf Oil: lb/ 1000 gal	Gas: Meter (cscf) Oil: Used (gal) Monthly	Criteria: TPY, Rolling 12 Month Sum
PSD Significance Thresholds	Georgia EPD	Lb/mm Btu, Btu/hr, Operating Hours	Gas: Meter (cscf) Oil: Used (gal) Monthly	TPY via Hr / Year
Greenhouse Gas	40 CFR Part 98 Subpart C	Enviance TCR Protocol	Gas: Meter (cscf) Oil: Used (gal) Monthly	Metric Tons / Year CO <sub>2</sub> e

# Why Harmonize Emissions Calculations?

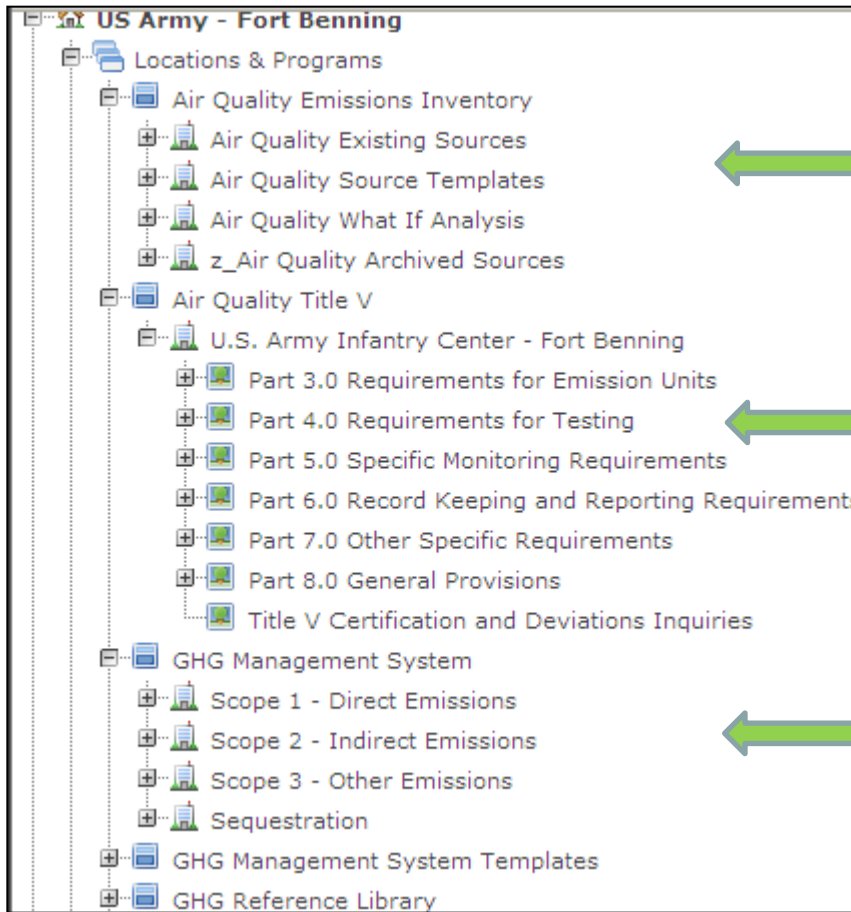
- Long term program continuity
  - Multiple spreadsheets on various computers
  - Staff turnover
  - No “institutional memory” of methods
- Consistency
  - Single data source (meter readings, e.g.) could drive 5 calculation sets
- Efficiency
  - Data collection and entry simplified
- Transparency
  - Key sustainability/stakeholder component

# The Emissions Harmonizing Process

- Agreement with Georgia EPA
  - PSD significance threshold
  - Criteria inventory
  - Title V limits
- Use raw data from its source
  - Meter readings (Hundreds scf) monthly
  - As opposed to pre-processing in excel spreadsheets
- Map single data entry to all dependent calculations
- Preserve previous methods
- One-time report configuration allows ongoing output



# File Organization in EMIS



Criteria, HAPs, and PSD calculations

Title V Permit Conditions (Including limit calculations)

GHG calculations

# Use raw data from its source

The screenshot shows a software interface with a navigation pane on the left and a main content area on the right. The navigation pane is titled "System Models" and contains a list of categories: Air Quality Existing Sources, Construction Activities, Engine Test Cells, Engine Testing, Fire Fighter Training Exercises, Fuel Transfer, Fueling Operations, and Heating Units. Under "Heating Units", there is a sub-entry "\_Fuel Use Data Entry" which is expanded to show three items: H008, H010, and H011. The main content area is titled "Applicable Requirements" and shows a breadcrumb path: "US Army - Fort Benning > Air Quality Emissions Inventory". Below this is a search bar and a table. The table has a header with "Select" and "Name" columns. It contains three rows of data, each with a checkbox in the "Select" column and a text entry in the "Name" column. The text entries are: "# Meter Reading H008 Hundreds scf", "# Meter Reading H010 Hundreds scf", and "# Meter Reading H011 Hundreds scf". Arrows point from the checkboxes in the table to the corresponding entries in the navigation tree: from the first row to H008, from the second row to H010, and from the third row to H011.

System Models

- Air Quality Existing Sources
- Construction Activities
- Engine Test Cells
- Engine Testing
- Fire Fighter Training Exercises
- Fuel Transfer
- Fueling Operations
- Heating Units
  - \_Fuel Use Data Entry**
    - H008
    - H010
    - H011

Applicable Requirements ?

US Army - Fort Benning > Air Quality Emissions Inventory

+ Search

Page: 1 of 1 1

Select	Name ▲
<input type="checkbox"/>	# <u>Meter Reading H008 Hundreds scf</u>
<input type="checkbox"/>	# <u>Meter Reading H010 Hundreds scf</u>
<input type="checkbox"/>	# <u>Meter Reading H011 Hundreds scf</u>

# Map raw data to drive emissions calculations

The screenshot displays a software interface for managing system models. On the left, a tree view under 'System Models' shows a hierarchy: 'US Army - Fort Benning' > 'Locations & Programs' > 'Air Quality Emissions Inventory' > 'Air Quality Existing Sources'. Under 'Air Quality Existing Sources', several categories are listed with expand/collapse icons: 'Construction Activities', 'Engine Test Cells', 'Engine Testing', 'Fire Fighter Training Exercises', 'Fuel Transfer', 'Fueling Operations', and 'Heating Units'. The 'Heating Units' category is expanded, showing a list of units: '\_Fuel Use Data Entry', 'H008', 'H010', 'H011', 'H018', 'H019', 'H020', 'H021', 'H022', and 'H023'. The 'H008' unit is highlighted with a mouse cursor. On the right, a table lists various emissions calculation items, each with a 'Select' checkbox and a 'Name' column. The table is scrollable, and a vertical scrollbar is visible. A black arrow points from the 'H008' unit in the tree view to the top of the table, and another arrow points from the 'H008' unit to the bottom of the table, indicating a mapping or selection process.

Select	Name ▲
<input type="checkbox"/>	12 Month Rolling Distillate Fuel Oil Usage
<input type="checkbox"/>	12 Month Rolling Natural Gas Usage
<input type="checkbox"/>	Annual Arsenic Emissions
<input type="checkbox"/>	Annual Arsenic Emissions (FO Combustion)
<input type="checkbox"/>	Annual Arsenic Emissions (FO Combustion) (Tons)
<input type="checkbox"/>	Annual Arsenic Emissions (NG Combustion)
<input type="checkbox"/>	Annual Arsenic Emissions (NG Combustion) (Tons)
<input type="checkbox"/>	Annual Arsenic Emissions (Tons)
<input type="checkbox"/>	Annual Benzene Emissions
<input type="checkbox"/>	Annual Benzene Emissions (Tons)
<input type="checkbox"/>	Annual Beryllium Emissions
<input type="checkbox"/>	Annual Beryllium Emissions (FO Combustion)
<input type="checkbox"/>	Annual Beryllium Emissions (FO Combustion) (Tons)
<input type="checkbox"/>	Annual Beryllium Emissions (NG Combustion)
<input type="checkbox"/>	Annual Beryllium Emissions (NG Combustion) (Tons)
<input type="checkbox"/>	Annual Beryllium Emissions (Tons)

# Preserve Previous Methods

**System Models**

- US Army - Fort Benning
  - Locations & Programs
  - Air Quality Emissions Inventory
  - Air Quality Title V
  - GHG Management System
    - Scope 1 - Direct Emissions
      - Fugitive Sources
      - Landfill
      - Military Training - Munitions Firing
      - Military Training - Open Burn Open Detona
      - Mobile Sources
      - Stationary External Combustion Sources
        - H008**
        - H010
        - H011
        - H018 and H019
        - H020, H021, and H022
        - H023 and H024
        - Natural Gas Combustion NOS
        - Peak Shaving Plant
      - Stationary Internal Combustion Sources
    - Scope 2 - Indirect Emissions
    - Scope 3 - Other Emissions
    - Sequestration
    - GHG Management System Templates
    - GHG Reference Library

**Description:** Natural Gas usage, expressed in standard cubic feet because EPA 40 CFR 98 Subpart C uses SCF as the unit of measure for natural gas.

**UOM:** SCF or

**Precision:**

**Calculation Purpose:** Beginning 1/15/2010 converts a meter reading for H008 (hundreds of scf) into a fuel use measured in scf. Please note that this switch in calculation method requires an initialization of the meter reading values as of 1/1/2010 such that the value for

**Calculation Requirements:** Add | Remove

[Annual Natural Gas\_H008\_mm scf] - US Army - Fort Benning\GHG Management System\Scope 1 - Direct Emis  
 [CH4] - US Army - Fort Benning\GHG Management System\Scope 1 - Direct Emissions\Stationary External Con  
 [CH4 Annual] - US Army - Fort Benning\GHG Management System\Scope 1 - Direct Emissions\Stationary Exter  
 [CO2-e] - US Army - Fort Benning\GHG Management System\Scope 1 - Direct Emissions\Stationary External C  
 [CO2-e Annual] - US Army - Fort Benning\GHG Management System\Scope 1 - Direct Emissions\Stationary Ext

**Calculation UDF Parameters:** UOM\_Liquid, UOM\_NatGas

Select	Action	Begin Date	End Date	Script
<input type="checkbox"/>	Edit	1/15/2010 12:00 AM		Calculation Definition: $(((\text{Meter Reading H008\_Hundreds scf}) - \text{PREV} ((\text{Meter Reading H008\_Hundreds scf})))) * 100$ Exceptions: None given
<input type="checkbox"/>	Edit	1/1/2000 12:00 AM	1/1/2010 12:00 AM	Calculation Definition: $[\text{Monthly Natural Gas Usage H008\_mm scf}] * 1000000$ Exceptions: None given

Historical calculation capability allows former methods to be used for legacy data

# Report on Ongoing Basis

1	<b>U. S. Army Infantry Center - Fort Benning</b>				
2	Fort Benning, Georgia 31905				
3	Permit Numbers 9711-215-0021-V-02-0 and 9711-215-0021-V-02-1				
4	Facility AIRS Number: 04-13-215-0021				
5	Attachment 1 - Semiannual Compliance Report				
6	Report Period:				
7					
8	<b>Permit and Condition Number</b>	<b>Month Ending</b>	<b>Permit Limit</b>	<b>Actual 12-Consecutive Month Sum</b>	<b>Unit of Measure</b>
9	3.2.3	07/31/2010	379.8	1.211	million cubic feet
10	3.2.3	08/31/2010	379.8	1.211	million cubic feet
11	3.2.3	09/30/2010	379.8	1.211	million cubic feet
12	3.2.3	10/31/2010	379.8	1.211	million cubic feet
13	3.2.3	11/30/2010	379.8	1.211	million cubic feet
14	3.2.3	12/31/2010	379.8	1.294	million cubic feet
15	3.2.4	07/31/2010	630,800	195,469	gallons
16	3.2.4	08/31/2010	630,800	195,469	gallons
17	3.2.4	09/30/2010	630,800	195,469	gallons
18	3.2.4	10/31/2010	630,800	195,469	gallons
19	3.2.4	11/30/2010	630,800	195,469	gallons
20	3.2.4	12/31/2010	630,800	266,063	gallons
21	3.2.5	07/31/2010	1,000,000	0	gallons
22	3.2.5	08/31/2010	1,000,000	0	gallons
23	3.2.5	09/30/2010	1,000,000	0	gallons
24	3.2.5	10/31/2010	1,000,000	0	gallons
25	3.2.5	11/30/2010	1,000,000	0	gallons
26	3.2.5	12/31/2010	1,000,000	0	gallons
<span>Report Page 1</span> <span>Attachment 1</span> <span>Sheet3</span> <span>Semi Annual Compliance</span> <span>Compliance Data for Title</span>					

Direct output from  
Enviance EMIS

Example of limit  
calculations for  
Title V Compliance  
Semi Annual  
Report

# Conclusions

- Actual cost savings realized
  - FY11 funding released by Air Program (\$50K), not requested for FY12
  - FY11 funding planned for PSD analysis being reallocated
- Simplified data entry
- Standard calculation methods
- Consistent calculations basis
- Program “memory” built into system
  - Will greatly assist future air program managers
  - Eliminates multiple excel spreadsheets
- Produces all required regulatory reports



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[www.ndcee.ctc.com](http://www.ndcee.ctc.com)

# Points of Contact

- **NDCEE Technical Monitor**  
Name: Dr. Chris Hamilton  
Organization: Ft. Benning  
Phone: (706) 545-4211  
Email: [christopher.e.hamilton@us.army.mil](mailto:christopher.e.hamilton@us.army.mil)
- **CTC Project Manager**  
PMt Name: Angie Degory  
Phone: (814) 269-2704  
Email: [degorya@ctc.com](mailto:degorya@ctc.com)
- **Enviance Project Manager**  
Name: Greg Gasperez  
Phone: (504) 483-7721  
Email: [GGasperez@enviance.com](mailto:GGasperez@enviance.com)

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