Team Radford
Commander's Public Meeting

16 August 2017

6:30-8:00 p.m.

Christiansburg Library

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Agenda

- 6:30 – 6:40: Welcome, Meeting Guidelines, Introductions
- 6:40 – 7:30: Compliance Actions and Project Updates
- 7:30 – 8:00: Wrap Up, Questions, Action Items

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Participant Guidelines

Guidelines:

- All participants are to treat each other with courtesy and respect.
- When someone is speaking, do not interrupt them.
- Raise your hand if you have a question or comment.
- Keep questions and comments concise.
- Do not become verbally combative with other attendees or participants.

Failure to comply:

- First instance of non-compliance will receive a verbal reminder of the guidelines.
- Second instance of non-compliance will receive a verbal reminder of the guidelines and notification that a third instance will result in removal from the meeting.
- Third instance of non-compliance will result in the offender being escorted out of the meeting area by security.

Recording Devices

- Authorized under Virginia law 2.2-3707.

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Introductions

U.S. Army

LTC James Scott, III
Commander, Radford Army Ammunition Plant (RFAAP)

Rob Davie
Deputy to the Commander, U.S. Army, RFAAP

Len Diloia Jr.
Acting Chief, Operations Team, U.S. Army, RFAAP

Justine Barati
Director of Public and Congressional Affairs
Joint Munitions Command

BAE Systems

Bill Hendon
Safety, Health, and Environment (SHE) Manager, Radford

Mary McCoy, PE
Environmental Manager, Radford

Christopher Finley
Communications Manager, Radford

Coterie Environmental LLC

Michele Gehring
Principal

Strategic Priorities

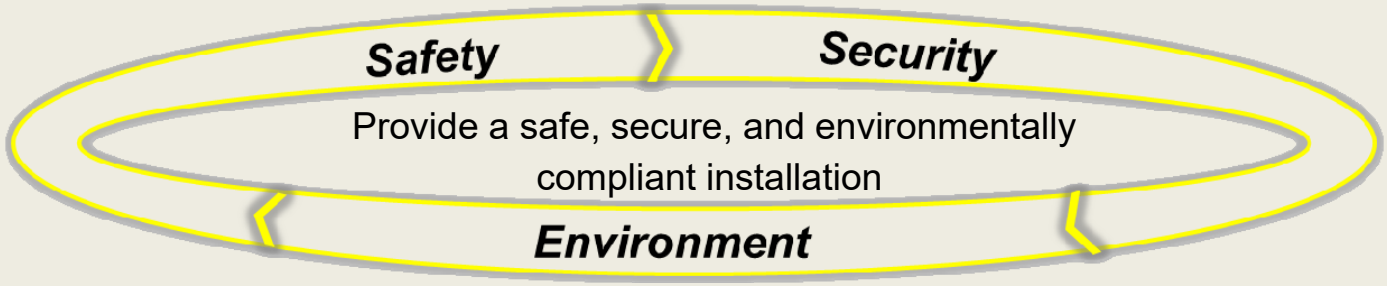
Mission: **To provide America's Warfighters with superior performing propellants, energetics, and munitions to enable engagement and destruction of targets with total confidence**

Vision: *The Nations best government and contractor workforce in the Organic Industrial Base. Epitomizing Competence, Commitment, and Character. Safely and Responsibly producing superior performing propellants, energetics, and munitions*

Priorities:

- **Readiness** — Readiness is our Purpose
- **Future** — Posturing beyond tomorrow
- **Workforce** — Commitment to the workforce and community

Focus:



Strategic Initiatives:

- **Capitalize on new and emerging technologies**
- **Develop long term growth and stability for the installation**
- **Resolute commitment to the warfighter, workforce, environment, and community**

Compliance Actions

Consent Order: Detail

- Issue: RFAAP received a consent order for
  - NOV ABRRO000592 - not meeting compliance extension deadline for package boiler installation
  - NOV ABRRO000629 - stack test results at the coal-fired powerhouse not meeting new air requirements
  - NOVs ABRRO000640 (issued 11 May 2017) and ABRRO000663 (issued 22 June 2017) for emissions from the Powerhouse exceeding 60% opacity during multiple six-minute periods.
- Resolution: Signed consent order and paid fine
- **Long-term resolution: Brought new boiler package online at the state-of-the-art steam plant. Ceased using the Powerhouse.**

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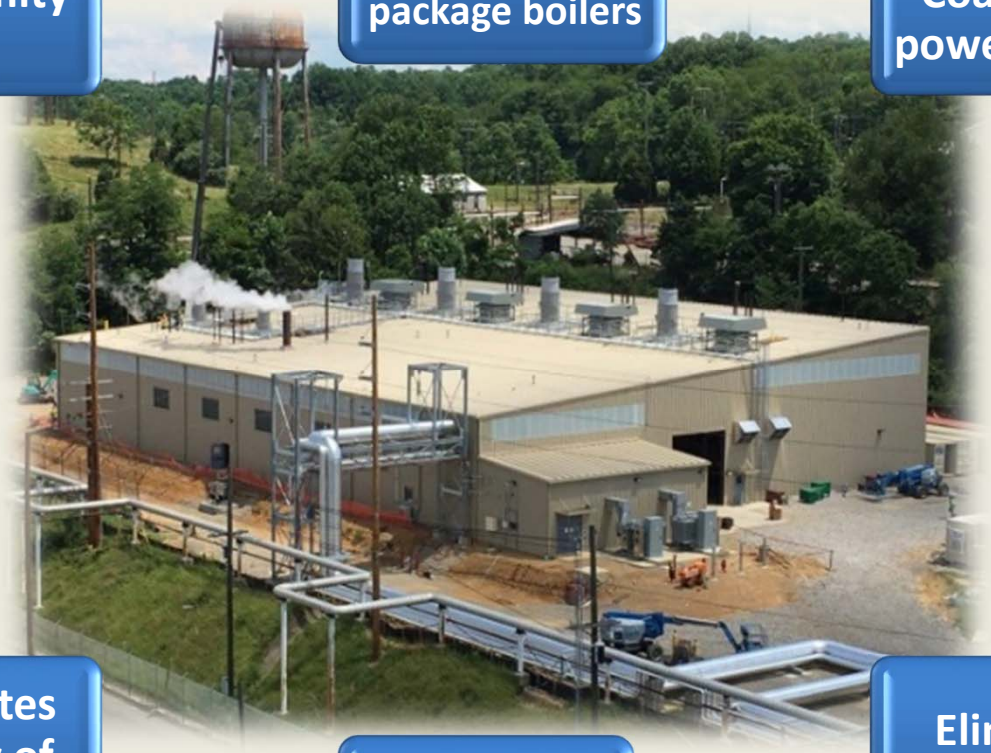
State-of-the-Art Steam Plant

Cleaner Community air

State of the art burner technology/ package boilers

Eliminates Coal-fired powerhouse



Eliminates 1200 tpy of NOx

Eliminates a source of NOVs

Eliminates 200 tpy of PM

Eliminates 3400 tpy of SO2

Eliminates coal ash

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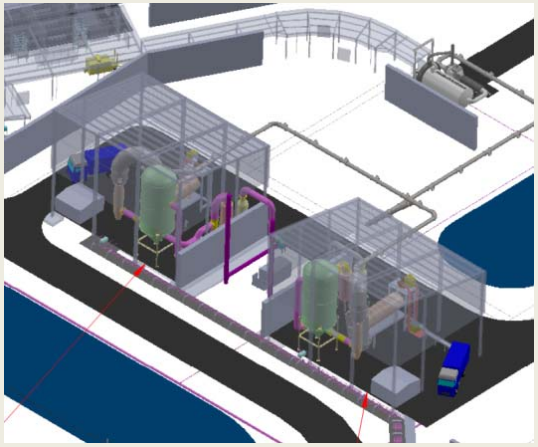
Energetic Waste Initiatives



Major Project - Design of new Explosive Waste Incinerator/Contaminated Waste Processor (EWI/CWP). Multimillion dollar effort that will reach 90 percent design completion by December 2017.

Additional Initiatives:

- Ongoing employee training efforts to reduce generation of waste
- Researching a way to safely reduce size of long grain propellants to be treated at the incinerator
- Research and development efforts within the Army to reduce or eliminate lead in propellants
- Alternative efforts to include car bottom furnaces, mining industry, feed base for biofuel

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OBG Air Sampling

Agenda

- Process
- Results
- What does it mean
- Way Ahead
- Questions

Characterization of Air Emissions from Open Burning at the Radford Army Ammunition Plant

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Research Triangle Park, North Carolina

August 2, 2017

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Field determination of multipollutant, open area combustion source emission factors with a hexacopter unmanned aerial vehicle*

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HIGHLIGHTS

- An unmanned hexacopter aircraft was coupled to an emission sampler.
- The system was flown into 84 combustion plumes.
- Gas and particles were sampled to determine emission factors.
- The system measured particulate matter, metals, volatile and semi-volatile organics.
- This system can safely and efficiently sample open area emission sources.

GRAPHICAL ABSTRACT

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ABSTRACT

An emission sensor/sampler system was coupled to a National Aeronautics and Space Administration (NASA) hexacopter unmanned aerial vehicle (UAV) to characterize gases and particles in the plumes emitted from open burning of military ordnance. The UAV/sampler was tested at two field sites with test and sampling flights spanning over 16 h of flight time. The battery-operated UAV was remotely maneuvered into the plumes at distances from the pilot of over 600 m and at altitudes of up to 122 m above ground level. While the flight duration could be affected by sampler payload (3.2–4.6 kg) and meteorological conditions, the 57 sampling flights, ranging from 4 to 12 min, were typically terminated when the plume concentrations of CO_2 were diluted to near ambient levels. Two sensor/sampler systems, termed "Kolibri," were variously configured to measure particulate matter, metals, chloride, perchlorate, volatile organic compounds, chlorinated dioxins/furans, and nitrogen-based organics for determination of emission factors. Gas sensors were selected based on their applicable concentration range, light weight, freedom from interferents, and response/recovery times. Samplers were designed, constructed, and operated based on U.S. Environmental Protection Agency (EPA) methods and quality control criteria. Results show agreement with published emission factors and good reproducibility (e.g., 26% relative standard deviation for $PM_{2.5}$). The UAV/Kolibri represents a significant advance in multipollutant emission characterization capabilities for open area sources, safely and effectively making measurements heretofore deemed too hazardous for personnel or beyond the reach of land-based samplers.

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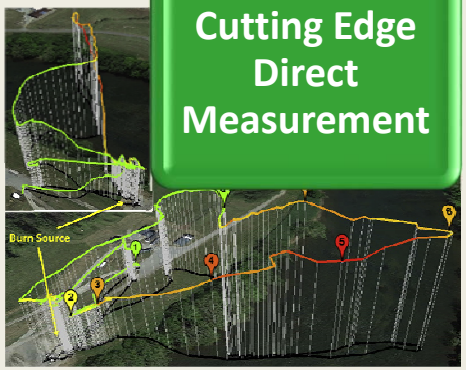
Improving the Process



Cutting Edge Direct Measurement

New Data

RFAAP Specific Emission Factors

Standard Table Method

Calculation of **Emission Factors**

Current System

Next Steps in the Process

Human Health and Ecological **Risk Assessment**

Develop Updated **Permit Limits**

- Drone sampling provides a new data source.
- This data will be used to ensure permit limits are protective of human health and the environment.

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What is an Emission Factor?

Emission Factor: The amount of pollutant emitted per the amount of material burned

Emission Factors do not equal Permit Limits

Permit Limit: Maximum amount of material that can be burned

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Results

Greater than 90% of the new emission factors are lower than previous emission factors or not found at all.

Pollutant	Number of EFs that are LOWER	Number of EFs that are HIGHER
Elements/Metals	17	4
Chromium VI	1	0
Dioxin/furan	17	0
Organics	25	1
Perchlorate	Not detected	———
Energetics	7	0
TOTAL	68	5

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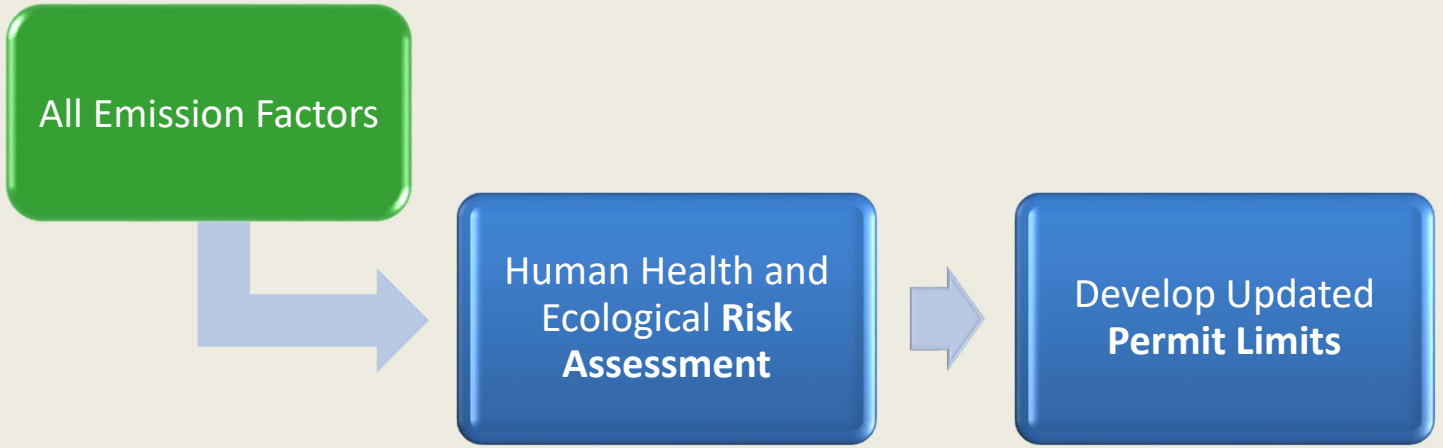
Characterization of Emission Factors

Pollutant	*New EF*	*Previous EF*	*Ratio*	*Difference*
Arsenic	0.0000208	0.000000554	37.5	0.000020
Cadmium	0.00000199	0.00000132	1.51	0.000001
Lead	0.0102	0.00206	5.0	0.008140
Silver	0.00000127	0.000000212	6.0	0.000001
Chloromethane	0.00000758	0.00000325	2.3	0.000004



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Summary and Way Ahead

- The sampling technology worked!
- New and improved emission factors now available for the permit renewal process.
- Greater than 90% of the new emission factors are lower than previous emission factors or not found at all.
- Next step in permit renewal is to work with DEQ to do the Human Health and Ecological Risk Assessment and create permit conditions.

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Questions

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Information is Available

Our commitment to responding to your questions doesn't end tonight. Resources exist for you to research information on your own or ask questions of our personnel.

Resources

Facebook: Like us at Radford Army Ammunition Plant

Homepage: www.rfaap.army.mil

Email: Usarmy.Radford.peo-eis.list.rfaap-public-affairs@mail.mil

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