# RAB Meeting

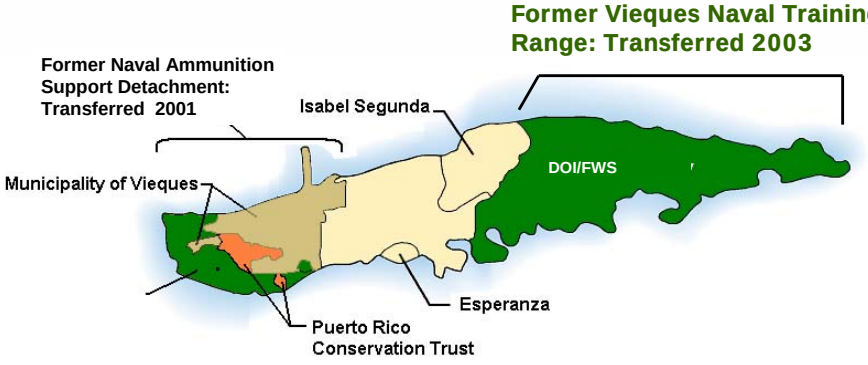
# Munitions Response Program Update

## Former VNTR

Vieques, Puerto Rico
January 2007

## Munitions Response Program Overall Objectives

- Conduct investigation and remedial actions that reduce risk to human health posed by explosive items.
- Reduce the explosives risk, as appropriate, to meet the U.S. Fish and Wildlife land use plan.



## Time Critical Removal Action

- 235 acres surface cleared in the Live Impact Area
- Items located requiring detonation
  - Live Bombs - 105
  - Inert Bombs - 917
  - Live Projos/Mortars - 1995
  - Inert Projos/Mortars - 1776
  - Live Rockets - 102
  - Inert Rockets - 10
  - Flares-Pyrotechnics - 39
  - Live ICMs - 28
  - Inert ICMs – 7
- More than 100,000 munitions related items have been removed

## Time Critical Removal Action

- Implemented “boat patrols” on north and south sides of LIA to inform and protect the public
- Air monitoring conducted to evaluate potential releases from detonations
  - To date, no detections of explosives compounds or metals exceeding screening levels

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## Time Critical Removal Action

- **On-site munitions debris and range related debris processing facility to insure scrap metal shipped off site is free of explosives**
  - Process includes cutting materials into manageable size and heating to insure no explosive residues remain

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## Support Actions

- **Completed biological assessment for LIA**
  - Continuing monitoring of turtle nesting areas
  - Conducting vegetation survey of ECA
- **Expanding biological assessment to EMA, SIA, and ECA**

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## Support Actions

- Conducted UXO Technician I training course
  - 13 local residents graduated
- Conducted 40 hour OSHA training and UXO awareness training
  - 49 local residents graduated
  - 47 graduates working as sweep personnel

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## Economics

- Economic impacts from training locals
  - Over $600,000 in salaries paid to local residents since November 2005
  - Over $750,000 in travel and lodging costs saved and applied to clean up effort
- Over $1,000,000 paid to Puerto Rican contractors and support personnel
- Average of $90,000 to $100,000 per month is spent for local services (housing, fuel, food)
- Munitions Response Program Funding
  - Fiscal Year 2005 - $8M
  - Fiscal Year 2006 - $20.0M
  - Fiscal Year 2007 - $ 19.6M

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## Air Emissions Modeling Approach

- **Objectives**
  - Support prescribed (controlled) burn variance application
  - Estimate impact of emissions in ambient air
  - Identify appropriate locations for monitoring stations
  - Identify target compounds for monitoring
- **Approach**
  - Series of joint calls (PREQB, EPA, FWS, US Navy) held to achieve consensus on modeling approach and Protocol
  - Final Modeling protocol prepared after comments received and incorporated on Draft and Draft Final Modeling Protocols

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## Air Emissions Modeling Summary

- **Two Types of models utilized**
  - CALPUFF model for dispersion of emissions from prescribed (controlled) burns
  - OBODM Gaussian dispersion model used for BIP emissions
- **Modeling conducted to represent "worst case concentrations" emitted from the LIA**
  - BIP modeling assumed 2 simultaneous 1000 lb detonations
  - Prescribed (controlled) burned modeling assumed burning a parcel up to 100 acres in size
- **Meteorological data used from 2003-2005**
  - Predominant wind flow determined to be in a westerly to northwesterly direction

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## Air Emissions Modeling Summary-Continued

- **Modeling results show that fine particulates of dust ($PM_{10}$) and carbon monoxide (CO) are the most significant emissions from the BIP and Prescribed (Controlled) burn modeling**
  - Worst case concentrations from the BIPs were estimated to be contained within close proximity to the LIA
  - Worst case concentrations from BIPs predicted to be not measurable in ambient air
  - Worst case concentrations from prescribed (controlled) burns were estimated to migrate towards Camp Garcia and Isabel Segunda
  - Under worst case conditions both PM and CO were estimated to be below their regulatory limits in populated areas (ambient air)

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## Preliminary BIP Modeling Results; $PM_{10}$

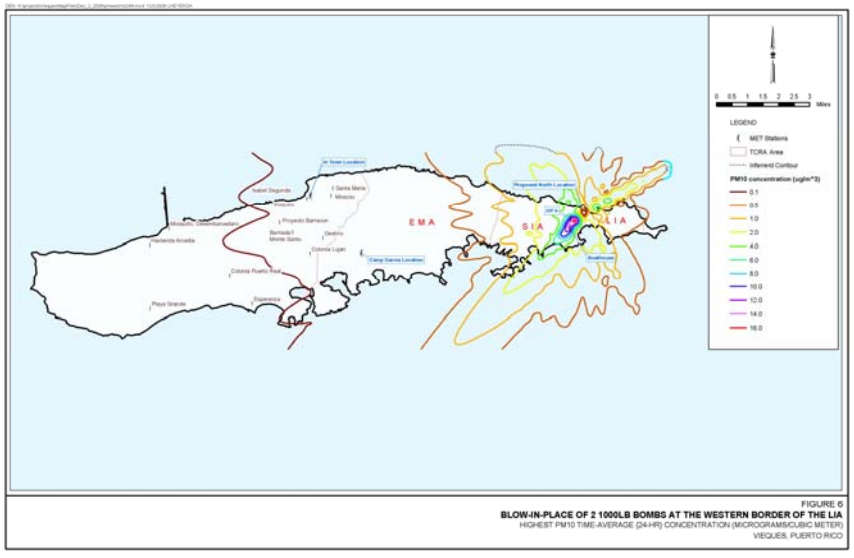



FIGURE 6
**BLOW-IN-PLACE OF 2 1000LB BOMBS AT THE WESTERN BORDER OF THE LIA**
HIGHEST PM10 TIME-AVERAGE [24-HR] CONCENTRATION (MICROGRAMS/CUBIC METER)
VIEQUES, PUERTO RICO

## Preliminary BIP Modeling Results; 1 hr CO

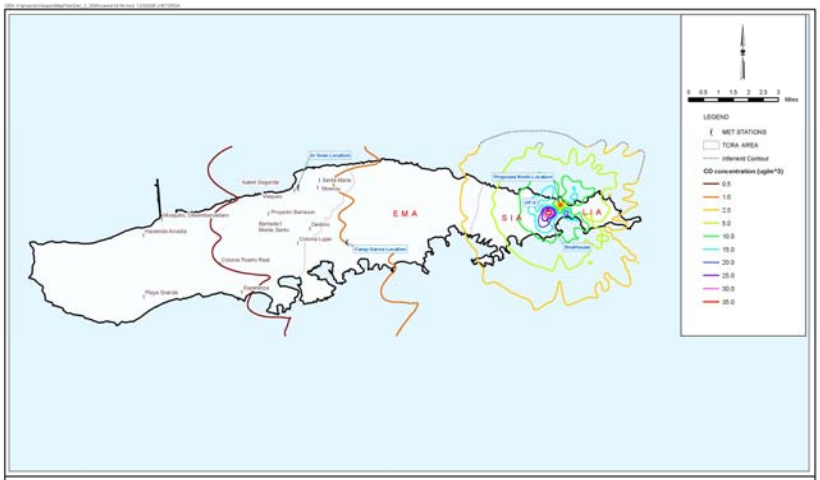
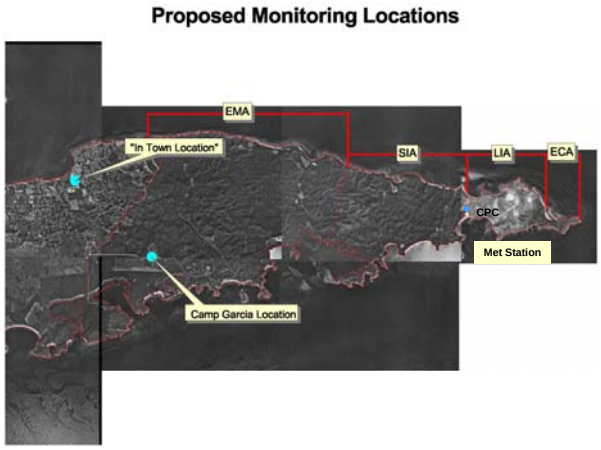



FIGURE 3
**BLOW-IN-PLACE OF 2 1000LB BOMBS AT THE WESTERN BORDER OF THE LIA**
HIGHEST CO TIME-AVERAGE (1-HR) CONCENTRATION (MICROGRAMS/CUBIC METER)
VIEQUES, PUERTO RICO

## Ambient Air Monitoring – Demonstrate compliance with NAAQS

- **Install compliance network of EPA Equivalent Method continuous $PM_{10}$ and CO monitors in 'ambient air'**
  - **Camp Garcia monitoring station (Line AC power)**
    - ***met station; WS, WD, T2, T10, SR, PB, RH***
    - ***$PM_{10}$ Automated, continuous, equivalent method***
    - ***CO Automated, continuous, equivalent method***
  - **'In Town' Isabel Segunda monitoring station (Line AC power)**
    - ***$PM_{10}$ Automated, continuous, equivalent method***
    - ***CO Automated, continuous, equivalent method***
  - **LIA/SIA met station**
    - ***Solar Power WS, WD, T2, T10, SR, PB, RH***
- **Use Ambient Monitoring Network to demonstrate and verify compliance**
  - **Correlate emission factors to $PM_{10}$ or CO as surrogate for very low concentration compounds**
- **Discontinue use of existing 'near source' network after start-up of ambient air network**

# Site locations

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# Monitoring Station


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## Prescribed (Controlled) Burn Plan Status

- **Draft Plan undergoing internal review**
  - Limits size of burn area to below 100 acres
  - Includes fire breaks and application of fire retardants to control fires
  - Constraints for burning during selected meteorological conditions and during volcanic activity
- **Prescribed (Controlled) Burning Variance Application to be submitted to PREQ and EPA**
  - Summary of air monitoring completed to date
  - Air Emissions Modeling Report
  - Air Monitoring Plan
  - Prescribed Burn Plan
- **Application to be submitted to public for review and comment**

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## Future Actions

- **Continue time critical removal action for remainder of LIA and ECA (850 acres)**
- **Submit Prescribed (Controlled) Burn Variance Application**
- **Conduct Phase II Site Inspection**
  - Investigate 35 identified munitions response sites
  - Perform digital geophysical mapping of roads and beaches identified in the U.S. Fish and Wildlife Service land use plan
- **Conduct removal action for subsurface MEC at roads and beaches**
- **Train 24 additional sweep personnel**
- **Train 25 additional UXO Technician I**

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