

SIRENUSA METHYL BROMIDE RESPONSE

Regional Response Team Meeting

Edison, NJ

November 4 & 5, 2015



Methyl Bromide Facts

- ▣ Colorless liquid or gas with sweetish, chloroform-like odor at high concentrations
- ▣ Boiling Point: 38.4⁰ F
- ▣ Vapor Pressure: 1.9 atm/1420 mm Hg
- ▣ Vapor Density: 3.27
- ▣ Ionization Potential: 10.54 eV
 - Multi-RAE Lamp: 10.6 eV

Methyl Bromide Facts

- ▣ Routes of Exposure
 - Skin Absorption (Liquid)
 - Eyes (Liquid)
 - Inhalation (Primary Route)
- ▣ Target Organs:
 - Eyes, Skin, Respiratory System, *Central Nervous System*
 - *Lipophilic Properties – access to brain*

Methyl Bromide Facts

Multiple Sources/Interpretation Needed

- ▣ IDLH: 250 ppm (NIOSH, 2003)
- ▣ OSHA PEL: 20 ppm (Ceiling)
- ▣ Cal OSHA PEL: 1 ppm
- ▣ ACGIH TLV: 1 ppm
- ▣ Label Info: <5 ppm, no respirator required
 - Approved respirators: Supplied Air/SCBA
- ▣ Odor Threshold: Conflicting Information
 - 5 ppm
 - 20 -1,000 ppm**
 - Musty or fruity above 1,000 ppm**

**Committee on AEGLs; Committee on Toxicology; National Research Council;

4/27/2012

Acute Exposure Guideline Levels (AEGLS)

- ▣ AEGL – 1: “could experience notable discomfort, irritation, or certain asymptomatic non-sensory effects”. *Not disabling; transient and reversible.*
- ▣ AEGL – 2: irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
- ▣ AEGL – 3: life threatening health effects or death.

Methyl Bromide AEGLS

Exposure Period	AEGL-1	AEGL-2	AEGL-3
10 minutes	NR	940 ppm	3300 ppm
30 minutes	NR	380 ppm	1300 ppm
60 minutes	NR	210 ppm	740 ppm
4 hours	NR	67 ppm	230 ppm
8 hours	NR	67 ppm	130 ppm

NR = Not recommended due to insufficient data

IDLH= 250 ppm

Various degrees of illness reported at 35ppm, 50 ppm - 150 ppm exposures

Methyl Bromide

Symptoms of Exposure

- ▣ Early Symptoms: dizziness, headache, nausea, vomiting, weakness and collapse.
 - Lung edema within 24-48 hours
- ▣ Repeated Overexposures:
 - Blurred vision
 - Staggering gait
 - Mental imbalance
 - Probable recovery after period of no exposure

Meth-O-Gas Q
Commodity Fumigant
Pesticide Label

Symptoms of Exposure

Sources: CDC, AEGIs Committee

- ▣ Headache, visual disturbance
- ▣ Vertigo, nausea, vomiting
- ▣ Anorexia, abdominal pain
- ▣ Malaise, muscle weakness, incoordination
- ▣ Slurring of speech, staggering gait, hand tremor, mental confusion
- ▣ Irritation of the respiratory system, pulmonary edema
- ▣ Convulsions/coma/death
- ▣ Delayed on-set of symptoms (several hours to a few days)
- ▣ Cumulative effects

Methyl Bromide

Environmental Fate

- ▣ Breaks down quickly in soil/stable in air
- ▣ Reacts slowly with water: HBr and MeOH
- ▣ Dissipates Quickly in Open Air
 - Storage Recommendations (cylinders)
 - ▣ Outdoor
 - ▣ Well ventilated structures

The Notification

Confusion of Facts

- ▣ OSC Garrison notified @ 16:40 hours on 3/20/15
- ▣ Garrison notified DPNR/VITEMA
- ▣ Details initially confusing:
 - La Sirena Villa, Coral Bay
 - Suspected Poisoning - Family of Four
 - ▣ Began stay 5 days earlier
 - ▣ Slowly showed neurological symptoms
 - ▣ Rushed to hospital the night before as symptoms worsened
 - Methyl Bromide Suspected; Details Unknown

The Initial Response

- ▣ Morning of 3/21/15: Garrison on Island
 - D'Onofrio supporting via telephone
 - Google Earth/Internet
 - Contact at La Sirena/The Paramedic
 - The Family Friend/The Sirenusa Front Gate

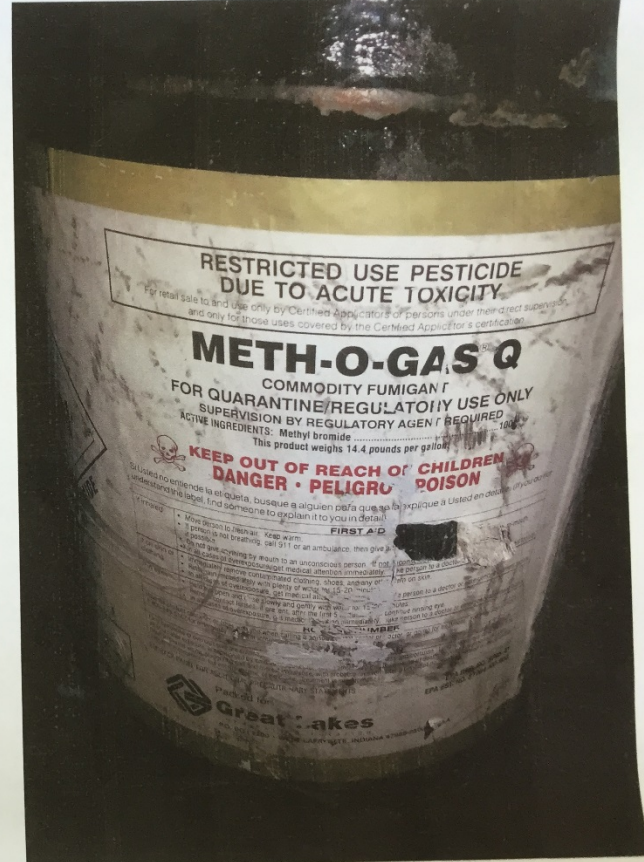
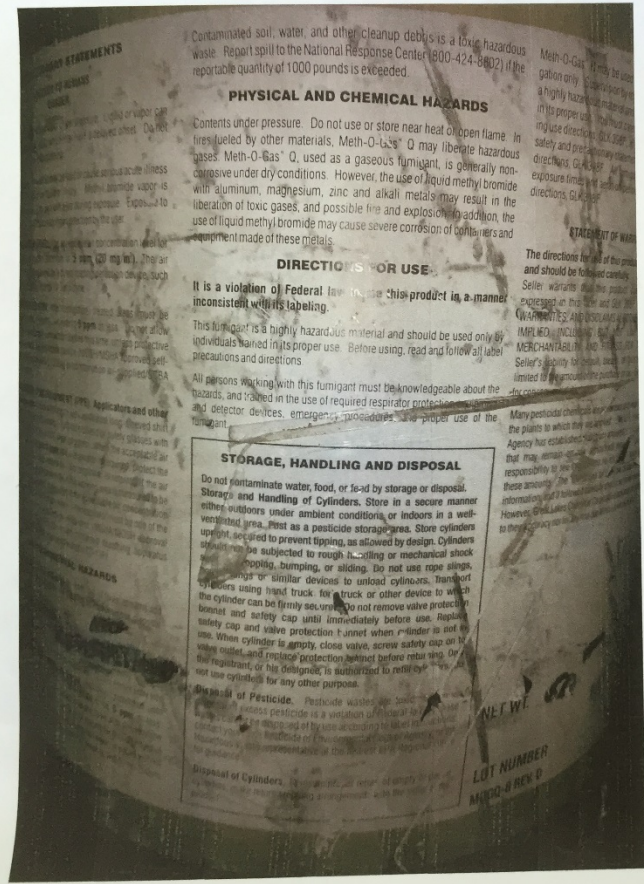
The Decision to Ramp Up Pulling the Trigger...

- Saturday (3/21) – EPA ERT Mobilized
 - Chemist – Raj Singhvi
 - 2 SERAS contractor personnel
 - SUMMA Canisters
 - Sample pumps/Charcoal Tubes/Pesticide Tubes
 - Monitoring Equipment
 - Level B/SCBAs
- Sunday – 2 RST Personnel Mobilized
 - Monitoring Equipment
 - **Radios**
 - Level B/SCBAs
- OSC D’Onofrio – Sunday Late Night

HQ Pesticides Help

It's all about the label....

5785-41



Difficult Logistics



Coping With Logistics

- ▣ St. John Fire Department
 - ▣ Chief Ernest Matthais
 - ▣ SCBA Regulators/Harnesses
 - ▣ Extra Air Bottles
 - ▣ Ability to fill/refill SCBA bottles
- ▣ Low Key Dive Shop
 - ▣ Helps out in a pinch
- ▣ ERT/SERAS/RST Assistance

Full Deployment

- ▣ 3/23/15: Assets Arrive on Island
 - OSC D'Onofrio
 - RST/SERAS Personnel
 - ERT Chemist – Flight Delays
- ▣ Meetings and Set-up
 - Sea Glass Properties
 - Terminex
 - DPNR
 - EPA and Contractors
- ▣ Most Equipment Arrives

The Interviews

- ▣ Lower J Unit fumigated Wednesday, 3/18/15
- ▣ Victims occupied Upper J Unit
 - Spent day at beach/fishing boat
 - Returned to Upper J for dinner/night
- ▣ Odd behaviors noted next day
- ▣ A call for help at 1:40 am on 3/20/15
 - Food poisoning suspected
 - Rushed via ambulance boat to St. Thomas Hospital
 - Dad returns to Upper J later in the morning

The Interviews

- ▣ Police investigate on morning of 3/20/15
- ▣ Calls to the paramedic
 - Possible Pesticide Poisoning
 - Hospital: *“Get him back here!!”*
 - Police: *“We need your help”*
- ▣ Sea Glass Staff
 - Contacted Terminex
 - Methyl Bromide named as fumigant
- ▣ Paramedics
 - Noted over-ripened banana smell
 - Suffered headaches for over 2 weeks

All Over a Beetle...



Response Objectives

J Upper and Lower Units



Operations



- ▣ Rapidly Evolving Plan
- ▣ Morning meetings
- ▣ Discussions on the Ferry
- ▣ Science as the Priority
 - Evolving Technical Approach
 - SUMMA Canisters needed
 - Sample tubes needed
 - ▣ Humidity Concerns
 - Fed Ex shipments delay sampling/entries

We sometimes need to have patience... ..

A Bigger Picture Emerges



- Lower J Fumigated on Wednesday, March 18, 2015; victims in Upper J
- Other Units fumigated in October, 2014 (I Lower, H Upper, C Lower)

October 2014 Fumigations

Concerned Residents

More Interviews

- ▣ Resident Illnesses/Symptoms
- ▣ Sea Glass Maintenance Staff
 - Experienced symptoms consistent with MeBr
 - Over-ripened mango odor
 - Musty Odor
- ▣ Initiated ATSDR/VI DOH Investigation
 - Paramedics/Police Responders Included

Assessment Findings

Multiple Entries During First Week

- ▣ Upper J Unit VOC readings (3/24/15)
 - 140 – 660 ppb
- ▣ Lower J Unit VOC readings (3/27/15)
 - 2.4 ppm -7.2 ppm
- ▣ SUMMA Grab Samples
 - J Upper (3/24): 0.748 -1.12 ppm
 - J Lower: (3/27): 0.5 ppm

Assessment Findings

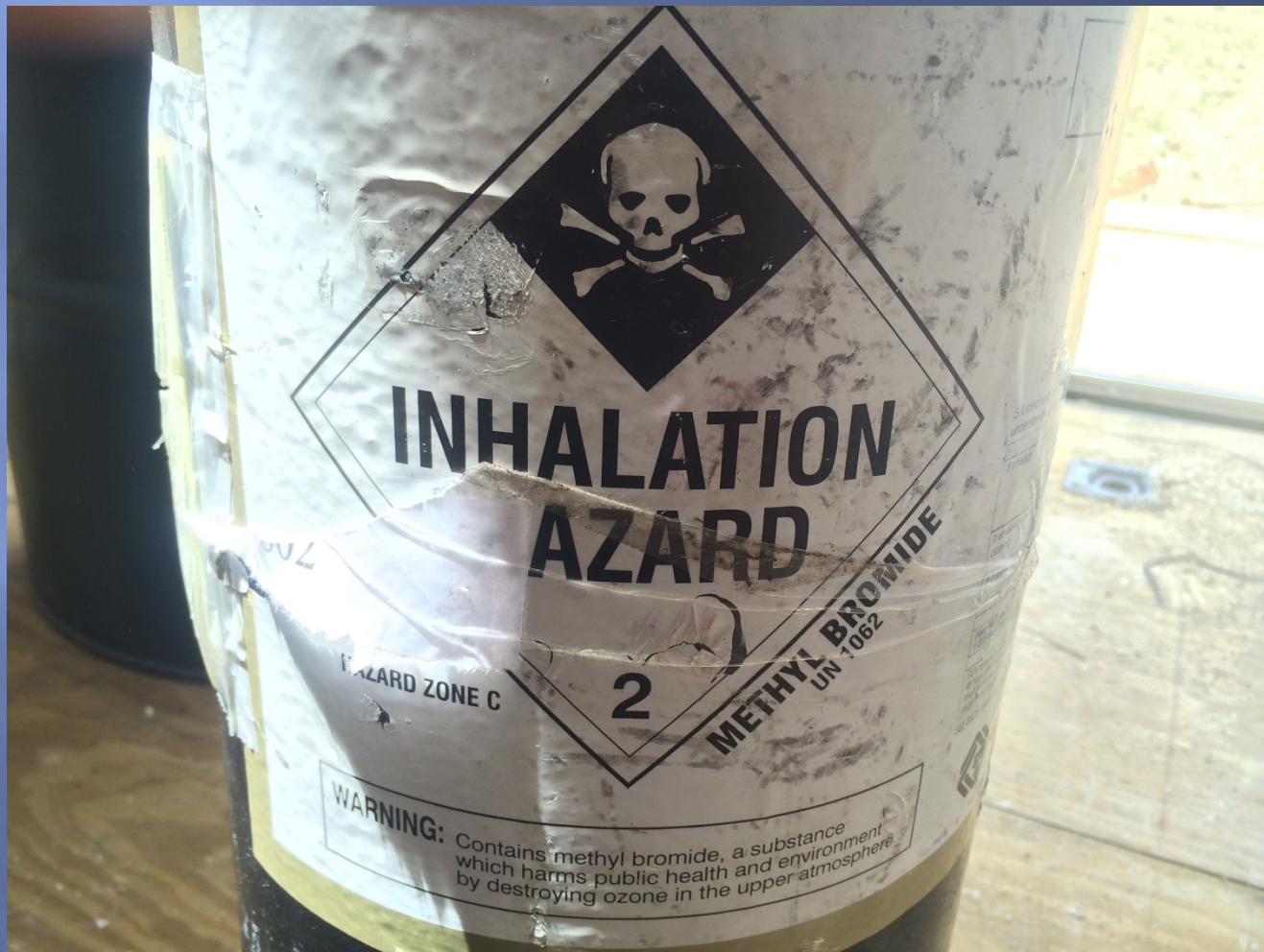
Methyl Bromide Confirmed

- ▣ Wipe Samples
 - Non-Detect for Bromide
 - Non-Detect for Pesticides
- ▣ PUF Sampling
 - Non -Detect for Pesticides
- ▣ Water Sampling: No Pesticides

Findings: Gap in Ceiling Air Handler Lower J

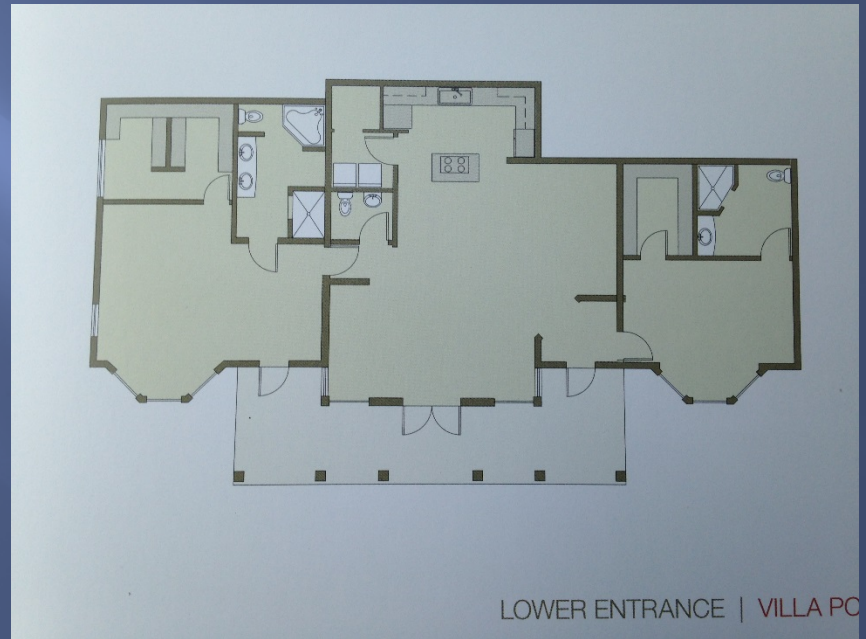


General Conclusions Over 1,000 ppm in Upper J?



Dialogue with the Doctors

- ❑ Blood testing for Bromide
- ❑ Doctors seeking explanations
- ❑ Ensuring proper treatment??



The Ventilation Plan Safety Concerns Well Vetted



• *Clearance for Occupancy*

- ▣ ATSDR & VI DOH made the call
 - 1.3 ppb reference value
 - 24 Hour SUMMA sampling

- ▣ J Upper: Cleared after 2 rounds
 - 4/5/15: 23 ppb
 - 4/19/15: all below 1.3 ppb

J Lower Proved More Difficult



J Lower Proved More Difficult...



Bagging The Furniture



Air Cleaners



Forced Fresh Air



Heating the Condo to 107° F



Clearance for Occupancy

- ▣ J Lower: 5 Rounds Ventilation/Sampling
 - 4/5/15: 85 - 100 ppb
 - 4/18/15: 10 ppb range
 - 4/27-5/1/15: 2 - 4 ppb
 - 5/16/15: 1.23 - 1.5 ppb

- ▣ Off-Gas Testing
 - Wood Cabinets
 - Sheet Rock
 - Pillows

J Lower Finally Clears

- ▣ And Finally...June 10, 2015 ...all below 1.3 ppb!!!

CONGRATULATIONS RAJ!!!

Cylinder Seizures

The Investigation Continues

