HEALTH HAZARDS ASSOCIATED WITH MARIJUANA GROW OPERATIONS

Colorado Drug Investigators Association

Acknowledgements

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Law Enforcement Agencies

• North Metro Task Force
• Aurora Police Department
• Longmont Police Department
• Larimer County Sheriff’s Office
Training Objectives

• Purpose and scope of the study
• Methodology of the research
• Data and conclusions from the study
• Discuss the impact of this information on you

This Study IS…

• …to determine the actual exposures associated with the investigation of MGO’s
• …to determine the potential health effects to first responders and children
• …to suggest PPE for first responders

This Study is NOT…

• …a comprehensive toxicology study of exposures to MGO’s
• …a study of clean-up or “remediation” practices
• …a study of the long term effects of exposure on MGO investigators
Study Focus

1. Levels of Carbon Dioxide/Carbon Monoxide
2. Chemical Exposures
3. THC Levels
4. Molds

Remember...

- The findings in this study do not imply safe conditions in MGO’s even if some health hazards may have been reported as low

30 MGO’s Studied

- 19 - Single Family Dwellings
- 5 - High Density Housing
- 1 - Mobile Home
- 4 - Office Building Units
- 1 - Commercial Warehouses
2 Types of L.E. Processing

- **Clippings and Photos**
  - MMJ (20 MGO’s)

- **Complete Dismantle**
  - Non-MMJ (10 MGO’s)

**Colorado Amendment 20**

- “Any property interest that is possessed, owned, or used in connection with the medical use of marijuana or acts incidental to such use, shall not be harmed, neglected, injured, or destroyed while in the possession of state or local law enforcement officials where such property has been seized in connection with the claimed medical use of marijuana.”

**Colorado Amendment 20**

- “Marijuana and paraphernalia seized in connection with the claimed medical use of marijuana shall be returned immediately upon the determination that the patient or primary care-giver is entitled to the protection contained in this section as may be evidenced by a decision not to prosecute, the dismissal of charges, or acquittal.”
Example #1

- Aurora, Colorado
- March 2, 2011
- 65 Plants
- Single Family Dwelling
- Clippings and Photos
Example #2

- Adams County, CO
- January 26, 2011
- 280 Plants Total
- High Density Housing
- Clippings and Photos

117 Plants
77 Plants
28 Plants
58 Plants

Example #3

- Commerce City, CO
- March 16, 2011
- 670 Plants
- Commercial Warehouse
- Clippings and Photos
Example #4

- Westminster, CO
- October 21, 2011
- 960 Plants Total
- Office Building Units
- Clippings and Photos

Findings

1. Levels of carbon dioxide and/or carbon monoxide
2. Chemical Exposures
3. THC Levels
4. Molds
Carbon Dioxide Levels

• CO₂ levels ranged from 400 ppm to 1400 ppm
  – Normal outside = 400 ppm
  – Normal inside levels are less than 1000 ppm
  – Toxic levels are above 5,000 ppm

* TLV = 5,000 ppm
* IDLH = 30,000 ppm

Carbon Monoxide Levels

• CO levels were at ambient levels
• Several MGO’s had unvented fossil fuel combustion sources
  – Concerns are nitrogen oxides and CO
Carbon Monoxide Levels

- Natural Gas burners as CO2 generators can create CO

Chemical Exposures

- Most chemicals utilized were either fertilizers, root conditioners, pH balancers, etc.
- Pesticides utilized had relatively low toxicities
- Many of the chemicals utilized had “Keep out of the reach of Children” warnings
- Some of the pesticides were listed for outside use only. ("Not for residential use")
Chemical Exposures

THC Levels

• Surface THC levels on surfaces ranged from non-detect to 2000 ug/wipe
  – Most surface levels were <10ug/wipe

THC Levels

• Hand contamination on 16 law enforcement officers ranged from non-detect to 2900 ug/wipe
  – Highest levels were on the hands of officers during complete dismantle operations
Facts

• Mold is everywhere in the environment
• Mold is on nearly every surface we contact
• Mold is in the air
• There are over 100,000 mold species, some more harmful than others
• Mold spores are less than 4 microns in size making them invisible to the human eye

Facts

• Elevated humidity coupled with high temperatures and the need for irrigation, frequently causes fungal growth within the MGO structure
Facts

• Increased fungal growth results in elevated mold exposures

• Special concern for children as well as the possibility of actual structural damage to the residence

Facts

• The levels of mold present within these residences may subject the occupants, emergency personnel and other individuals entering the residences to significant health hazards

Mold Spore Levels

• There are no specific levels for mold overexposure

• It is generally accepted that mold exposures that exceed 10x the outside level are potentially injurious, especially to children and sensitive individuals
Mold Sample Types

1. Viable Samples
   - Determines types and amounts of molds
2. Non-Viable Samples
   - Organisms do not have to be grown
   - Count of airborne mold spores
3. Dust Samples
   - Determines relative moldiness of the structure

Mold Findings

• There was a large shift in species between outside and inside air levels
  - This indicates the indoor molds were likely the result of the MGO’s
  - Outside mold levels were predominately composed of Cladosporium
  - Inside mold levels were predominately composed of Penicillium

Mold Findings

• Penicillium is associated with wet conditions indoors
  - Has been linked to pulmonary illness in Colorado and other areas of the country.
  - Penicillium can be a serious threat to the health of individuals who are especially allergic to fungi.
Hypersensitivity Pneumonitis

• Inflammation of the lungs due to breathing in a foreign substance, usually certain types of dust, fungus, or molds

• These exposures can lead to lung inflammation and acute lung disease. Over time, this acute condition may turn into long-lasting (chronic) lung disease.

Hypersensitivity Pneumonitis

• The chronic form of this disease may lead to pulmonary fibrosis (a scarring of the lung tissue that often is not reversible).

Hypersensitivity Pneumonitis

• Initial Symptoms May Include:
  – Chills
  – Cough
  – Fever
  – Malaise (feeling ill)
  – Shortness of breath
Hypersensitivity Pneumonitis

• Symptoms of chronic hypersensitivity pneumonitis may include:
  – Breathlessness, especially with activity
  – Cough, often dry
  – Loss of appetite
  – Unintentional weight loss

• Signs and tests
  – Your doctor may hear abnormal lung sounds called crackles (rales) when listening to your chest with a stethoscope
  – Lung changes due to chronic hypersensitivity pneumonitis may be seen on a chest x-ray

PPE Suggestions

• Primary hazard observed in this study
  – MOLD!!
  – Primarily a pulmonary hazard but US EPA suggests that skin protection also be provided
PPE Suggestions

• 3 Recommended Response Levels:
  – Level 1: Basic Response
  – Level 2: Intermediate Response
  – Level 3: Advanced Response

PPE Suggestions

• Level 1: Basic Response for MINIMAL time in the MGO

PPE Suggestions

• Level 2: Intermediate Response
PPE Suggestions

• Level 3: Advanced Response

Evidence Storage Considerations

• Based upon the fungal levels that this study found to be associated with the marijuana grows, samples of this marijuana should be considered to be highly contaminated with fungal spores, especially Penicillium spores.

Evidence Storage Considerations

• The safest and most cost-effective handling method may be disposal of the material at the earliest possible convenience.
Preliminary Conclusions

• Levels of carbon monoxide were not elevated during our study
  • Many MGO's were not using CO₂ at the time of our entry
  • Some facilities were using CO₂ gas during our entry

Preliminary Conclusions

• Although pesticides, herbicides, and other chemicals were present, none of the compounds found had high toxicity levels
  – Canadian authorities have reported more toxic pesticides

Preliminary Conclusions

• Although THC levels were high, especially on the hands of officers participating in tear-out, they were likely not toxic

• No solvents or other VOC’s were found at levels of concern
  – We did not conduct any sampling where reported THC extraction had occurred to any degree
Preliminary Conclusions

• Total mold spore concentrations were elevated in a number of MGO’s

• Penicillium levels were increased in a large number of MGO’s
  – Levels were increased to extremely high levels during tear-out operations

Preliminary Conclusions

• Mold levels in many of the MGO’s were present at levels that could cause serious health concerns if exposure period is prolonged

Risks to Children
Risks to Children

2 Young Students Suspected Of Bringing Marijuana To School

Parents Charged After Toddler Eats Pot Cookies
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