Informational Meetings on Proposed New Blasting Regulations

July 6 - 7, 2005

Agenda

- Introductions
- Purpose of The Meeting
- Summary of Consultant’s Reports
- Timeline of Ordinance Adoption
- Effect of New Regulations On Existing Permits
- Highlights of Blasting Regulations
- Additional Questions and Comments
- Next Steps

Introductions

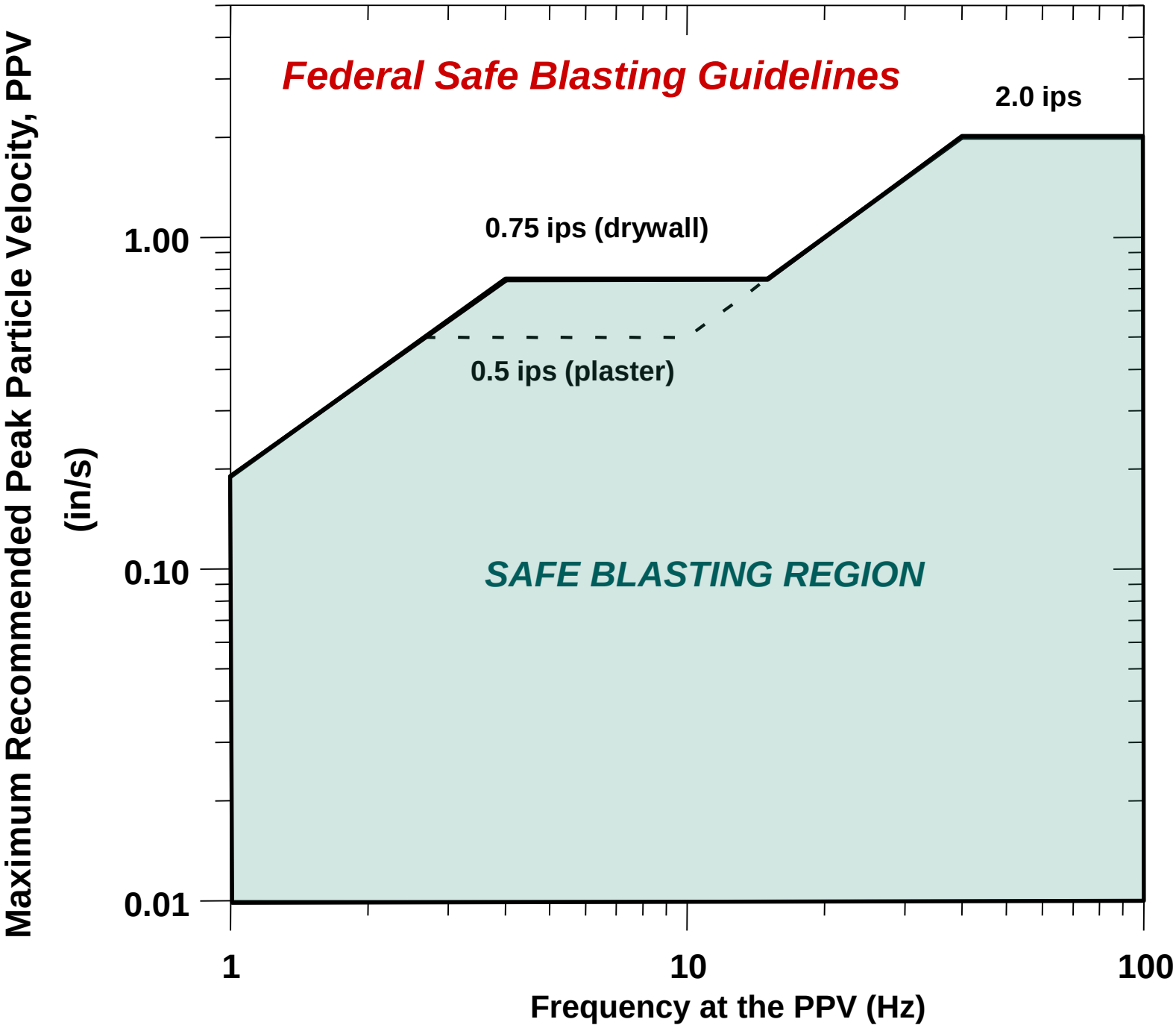
- Fulton Cochran, Deputy Fire Marshal
- Dr. Catherine T. Aimone-Martin, City of Henderson Blasting Consultant

Purpose of The Meeting

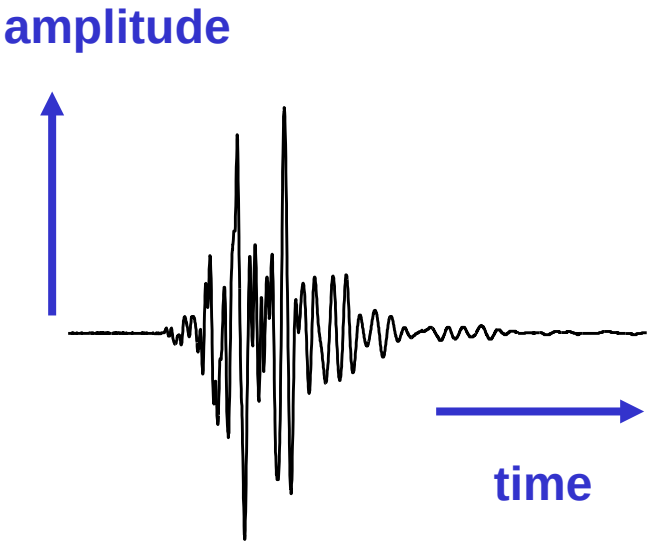
- Invite Appropriate Comments and Input on New Blasting Regulations
- Consultant’s Comments about Reports
- Discuss Timeline of Ordinance Adoption
- Discuss Effect of New Regulations On Existing Permits
- Present Highlights of Blasting Regulations

Summary of Consultant's Reports

- Dr. Catherine T. Aimone-Martin
  - » Dr. Aimone-Martin is President of Aimone-Martin Associates, LLC and a Professor Mining and Civil Engineering at New Mexico Institute of Mining and Technology
  - Reports available at www.cityofhenderson.com
  - – Final Attenuation Report
  - – Final Structural Response Report

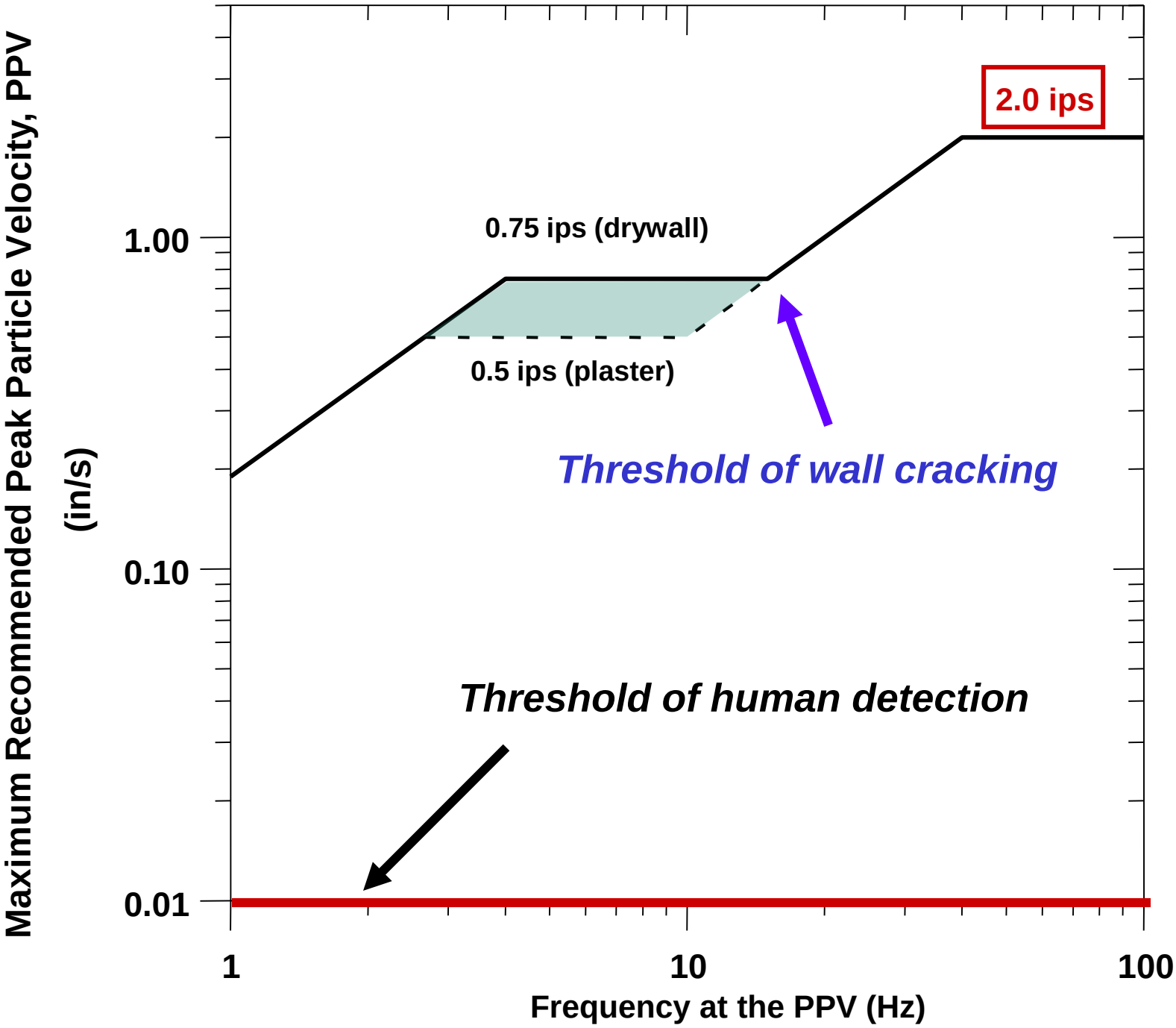

Federal Safe Blasting Guidelines
2.0 ips
0.75 ips (drywall)
0.5 ips (plaster)
SAFE BLASTING REGION
Maximum Recommended Peak Particle Velocity, PPV
(in/s)
1.00
0.10
0.01
1
10
100
Frequency at the PPV (Hz)

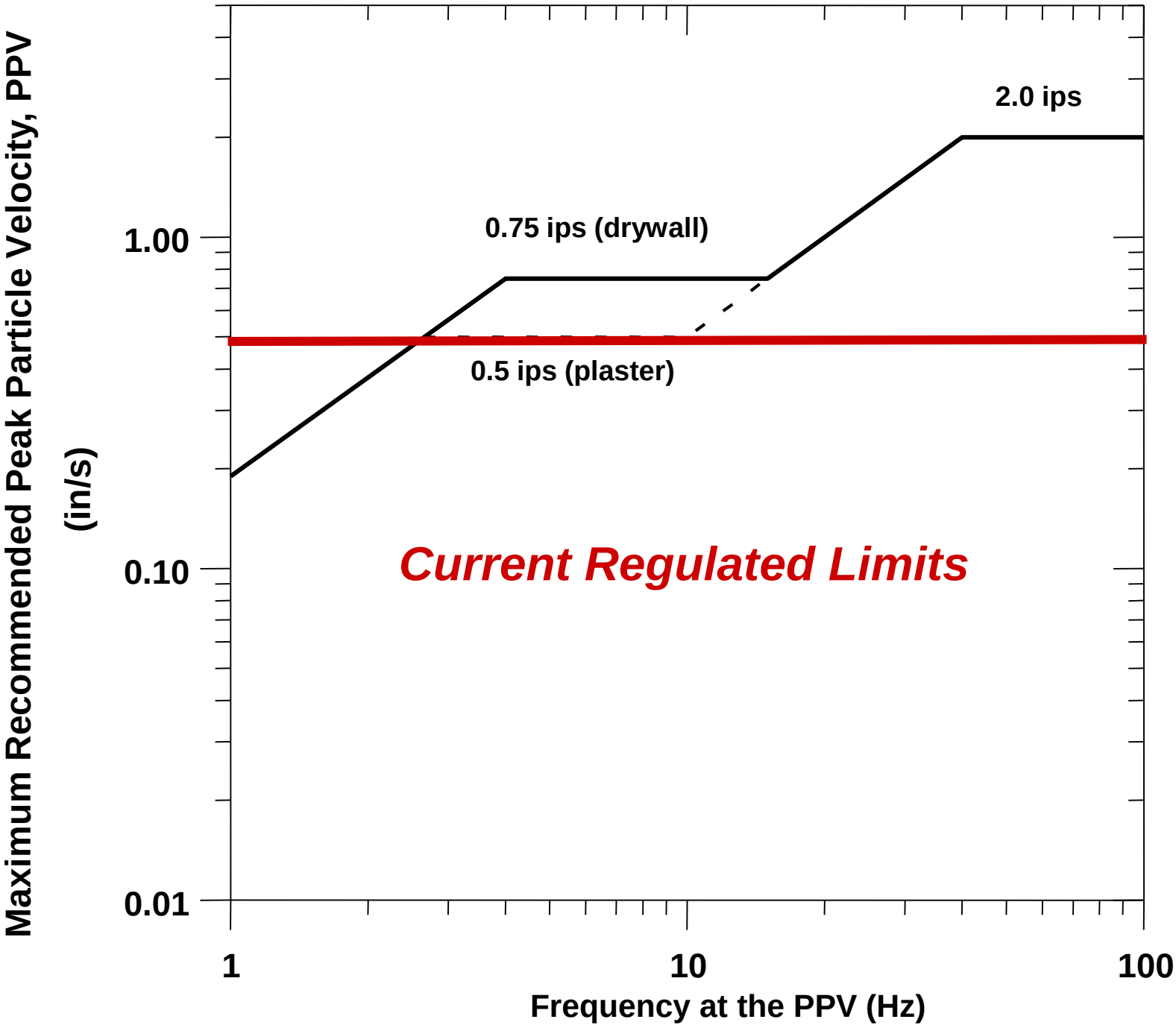
What is frequency?



high frequency

low frequency


Maximum Recommended Peak Particle Velocity, PPV
(in/s)
1.00
0.10
0.01
2.0 ips
0.75 ips (drywall)
0.5 ips (plaster)
Threshold of wall cracking
Threshold of human detection
1
10
100
Frequency at the PPV (Hz)


Maximum Recommended Peak Particle Velocity, PPV
(in/s)
1.00
0.10
0.01
2.0 ips
0.75 ips (drywall)
0.5 ips (plaster)
Current Regulated Limits
1
10
100
Frequency at the PPV (Hz)

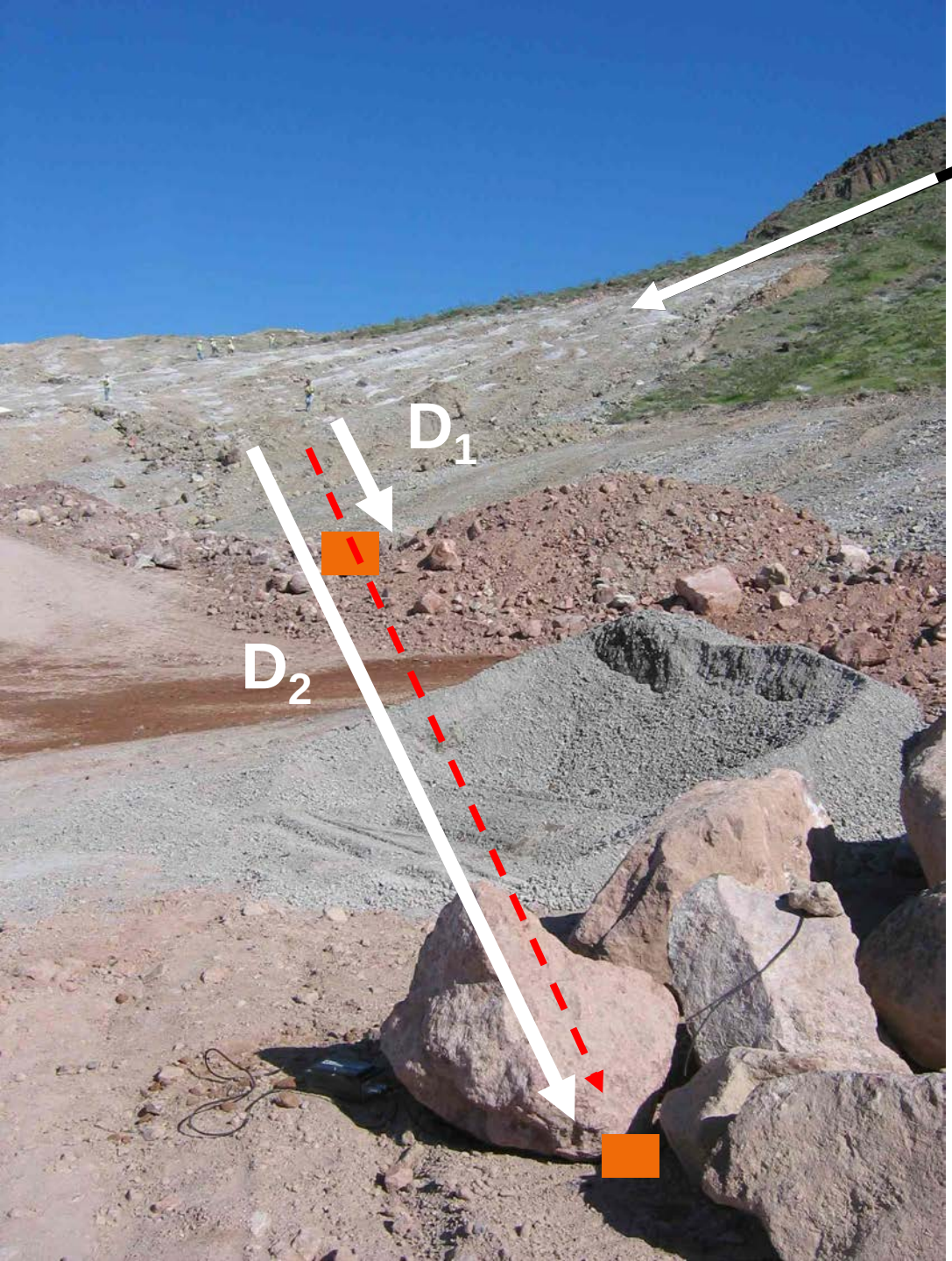
ATTENUATION STUDY

- **STATE OF THE ART**
  - Evaluate historical seismograph measurements and data from blasting operators

- **VERIFICATION**
  - validate historical measurements

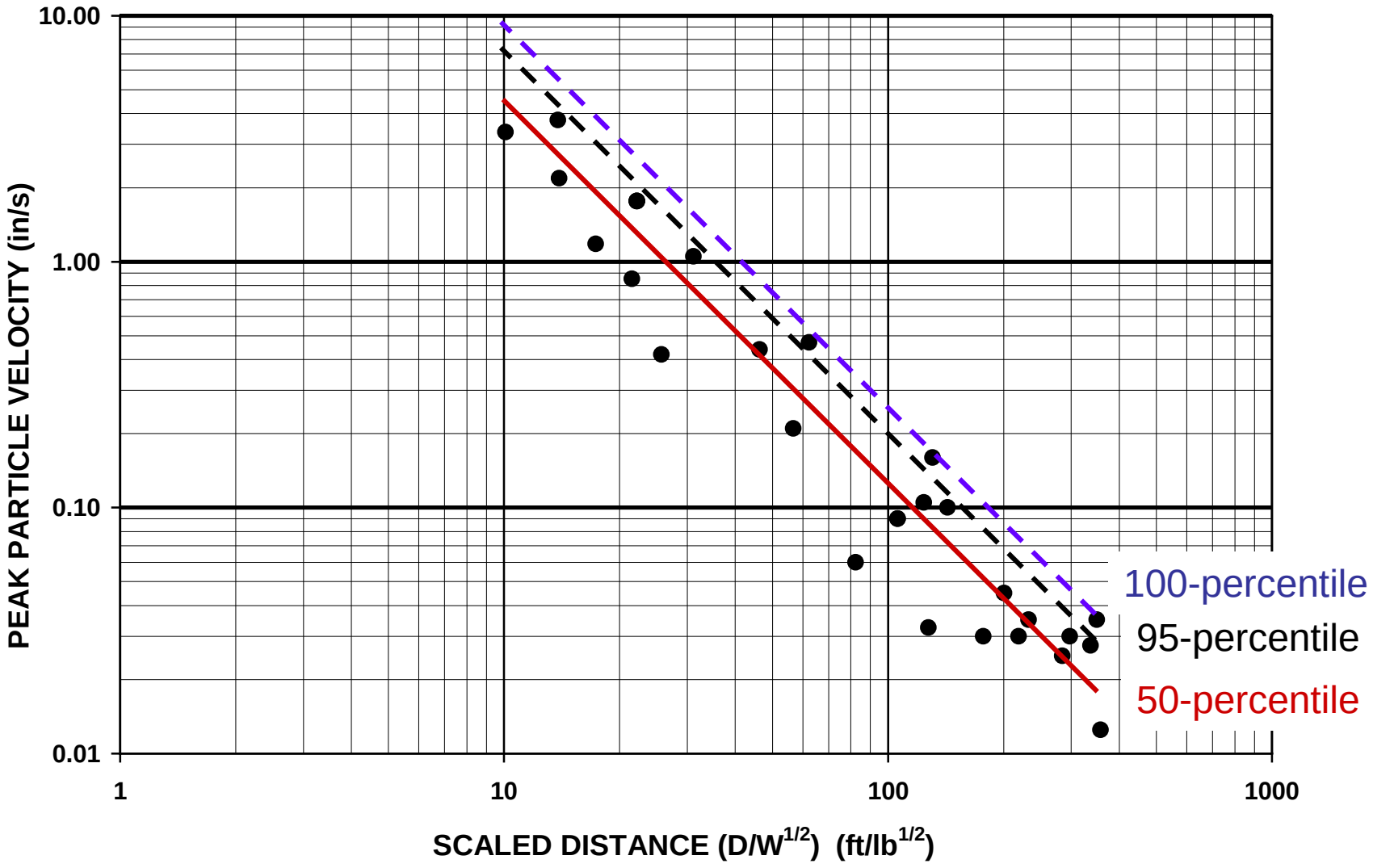
- **GEOLOGICAL CONTROLS**
  - evaluate geological influences that may be contributing to unusual ground vibrations in various directions from blasting operations, and

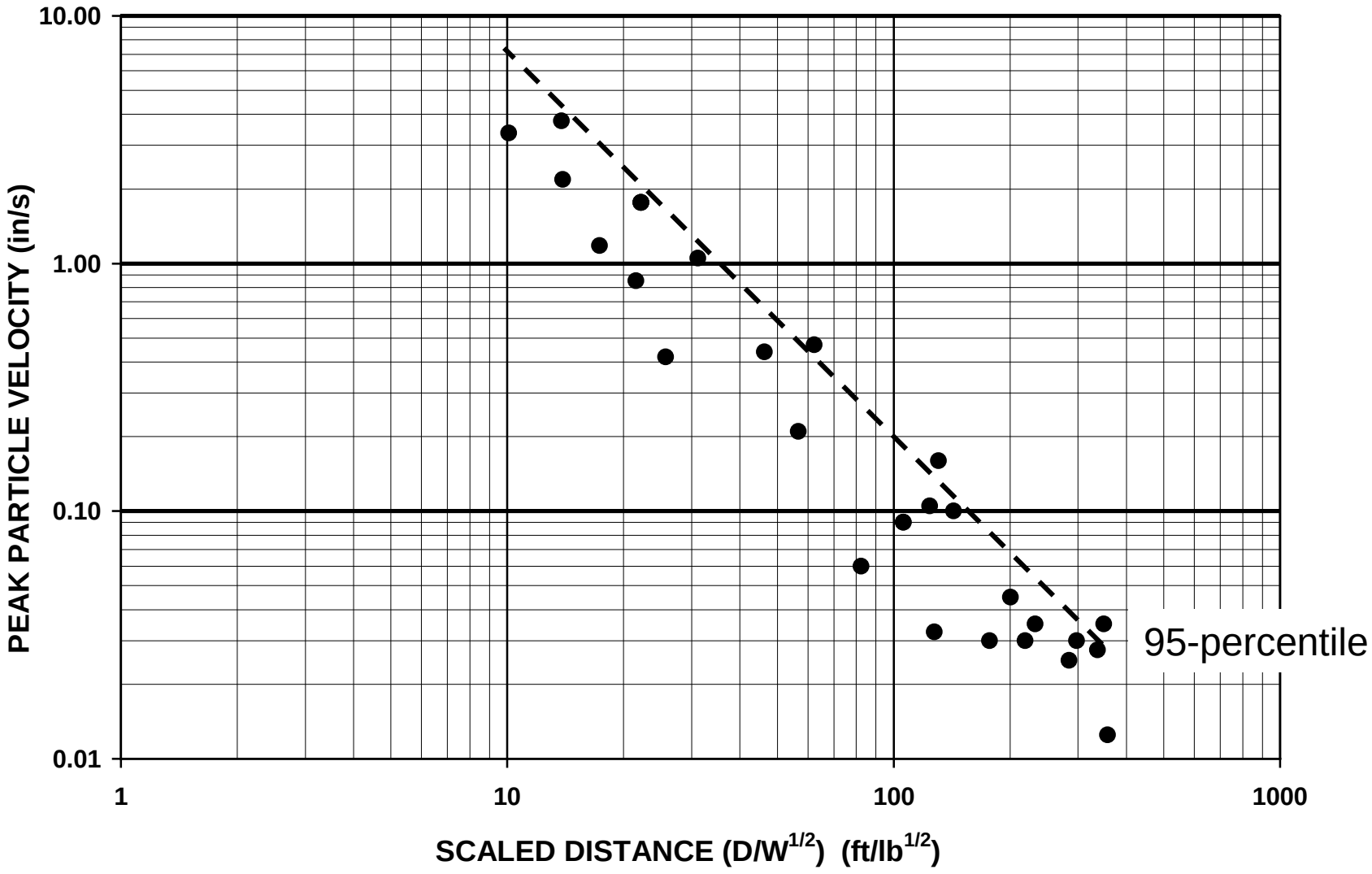
- **BLASTING CONTROLS**
  - evaluate blasting methodology as it may be influencing unpredictable or unusual ground vibrations or airblast.

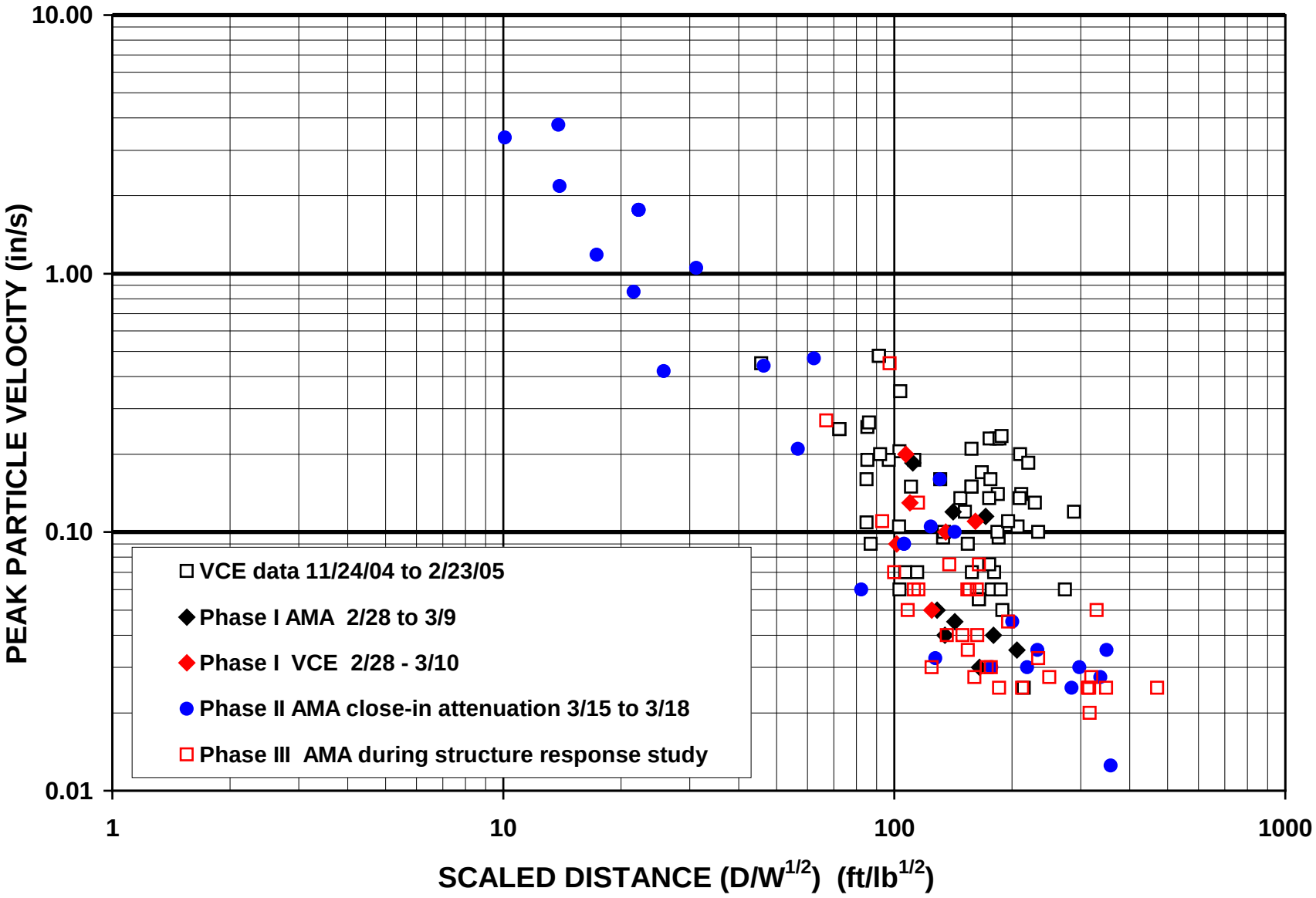


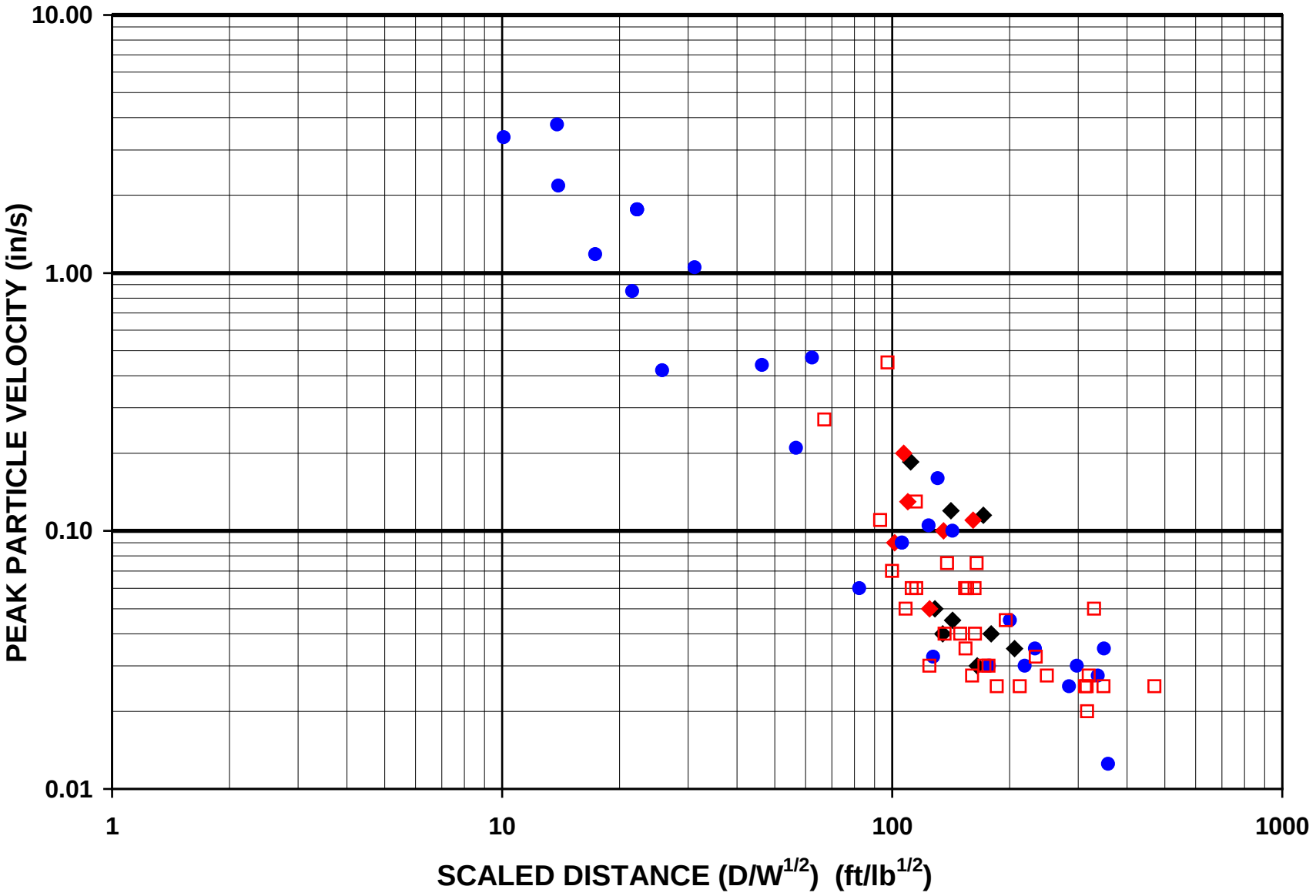
Close-in seismograph array

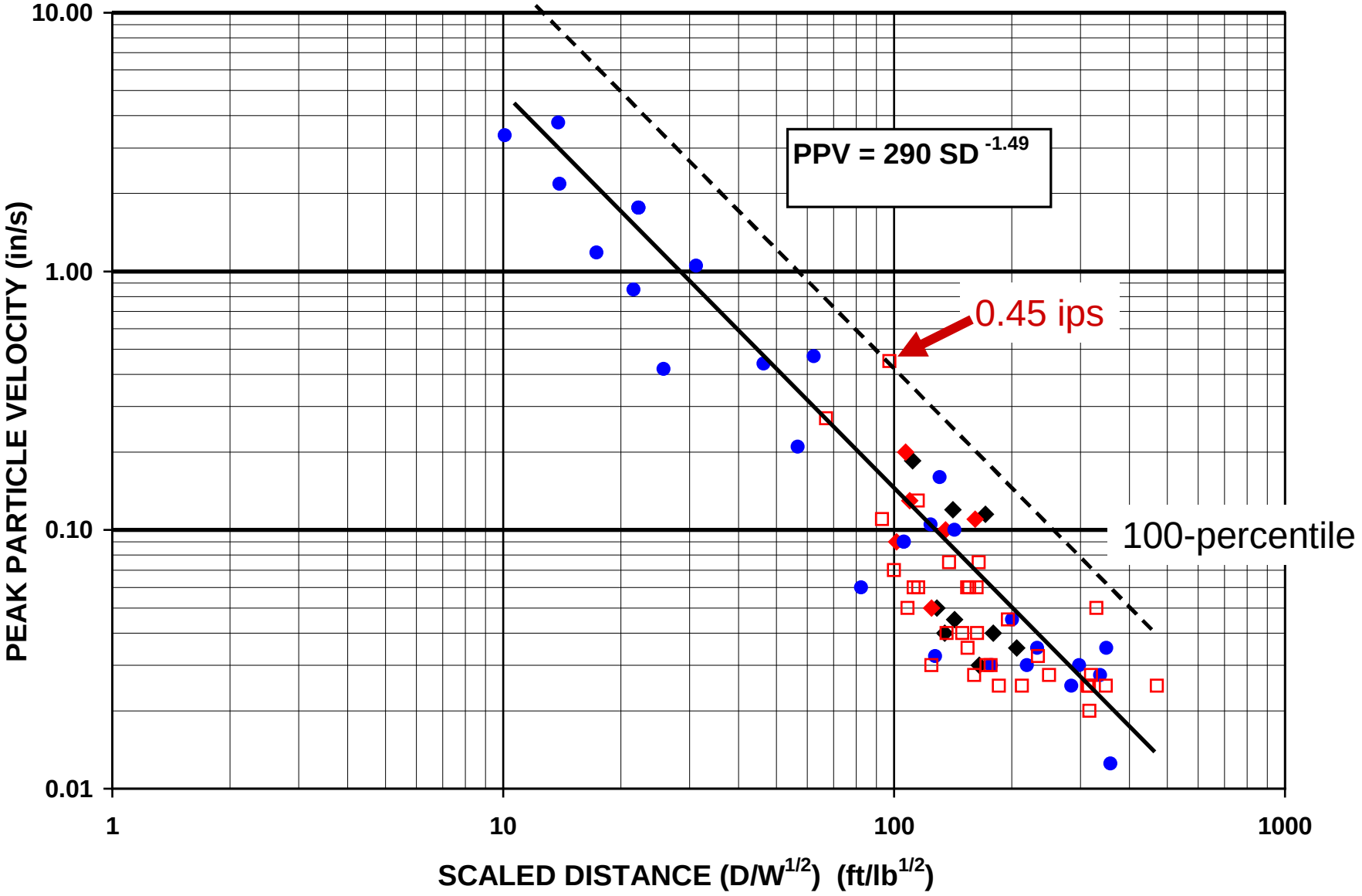

Array 1
Array 2
D_4
D_3


10.00
1.00
0.10
0.01
PEAK PARTICLE VELOCITY (in/s)
1
10
100
1000
SCALED DISTANCE (D/W1/2) (ft/lb1/2)
100-percentile
95-percentile
50-percentile


10.00
1.00
0.10
0.01
PEAK PARTICLE VELOCITY (in/s)
1
10
100
1000
SCALED DISTANCE (D/W1/2) (ft/lb1/2)
95-percentile


10.00
1.00
0.10
0.01
PEAK PARTICLE VELOCITY (in/s)
1
10
100
1000
SCALED DISTANCE (D/W1/2) (ft/lb1/2)
VCE data 11/24/04 to 2/23/05
Phase I AMA 2/28 to 3/9
Phase I VCE 2/28 - 3/10
Phase II AMA close-in attenuation 3/15 to 3/18
Phase III AMA during structure response study


10.00
1.00
0.10
0.01
PEAK PARTICLE VELOCITY (in/s)
1
10
100
1000
SCALED DISTANCE (D/W1/2) (ft/lb1/2)


10.00
1.00
0.10
0.01
PEAK PARTICLE VELOCITY (in/s)
PPV = 290 SD -1.49
0.45 ips
100-percentile
1
10
100
1000
SCALED DISTANCE (D/W1/2) (ft/lb1/2)

CONCLUSIONS

- Blasting and vibration monitoring employ state-of-art methods and represent best practices

- Historical vibration records showed vibration levels slightly higher than those recorded during the study (2/25/05 to 4/14/05) and within regulatory limits

- Measurable influences of geology and terrain conditions were detected and were determined not to be statistically significant and do not warrant special regulatory consideration

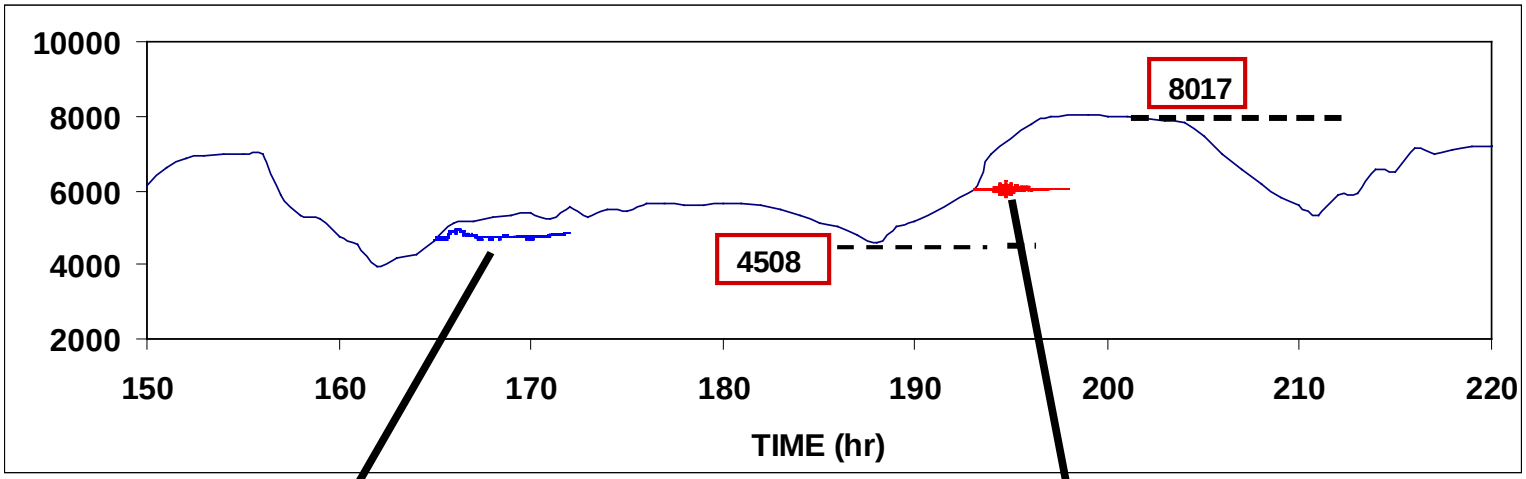
- Blasting controls during the study were greatly improved through better record keeping

STRUCTURE RESPONSE STUDY

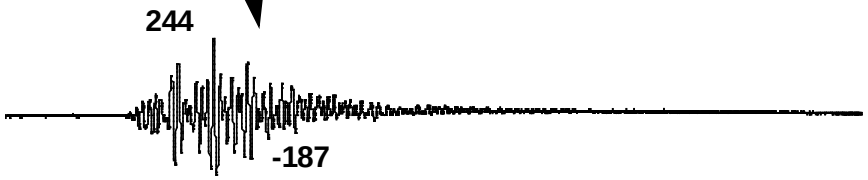
- Compare vibrations within structures with ground excitations and air overpressures
- Determine natural frequencies and damping characteristics
- Determine structure amplification of ground motions
- Estimate global shear and in-plane tension wall strains
- Compute bending strains in walls
- Compare crack movements subjected to blasting, variations in temperature and humidity and wind gusts

MOVEMENT OF EXTERIOR STUCCO CRACK

over a 3 day period



Crack displacement during wind gust 3/23/05 at 2:15 am



Crack displacement during blast 3/23/05 at 2:47 pm

0.45 ips blast

CONCLUSIONS

- Current limits of 0.5 ips protect structure from cracking with A 100% confidence
- Wall strains from environmental changes are 72 times greater than those from blasting
- Wall strains from wind gusts are 10% greater than those from blasting
- Wall strains produced by near-by construction activities are similar to those from blasting
- Airblast pressures do not measurably affect structures

Timeline of Ordinance Adoption

- City Council – June 21, 2005 (Introduced)
- Informational Meetings – July 6 - 7, 2005
- City Council – July 19, 2005
- Published – July xx, 2005
- Effective Date – July xx, 2005

Effect of New Regulations On Existing Permits

- No effect
  - Existing permits will continue under regulations in effect at time of permit issuance until natural permit expiration date

Highlights of Blasting Regulations

- Scope
  - The use of explosives within 100 feet of a structure, building, or utility is prohibited
  - Special requirements for explosives used at a distance greater than 100 feet and less than 300 feet from a structure, building, utility, or public improvements
  - Defines requirements for explosives used greater than 300 feet from a structure, building, utility, or public improvements

Highlights of Blasting Regulations

- Substantial Compliance Standards
  - Same as existing requirements
- Technical Opinions & Reports
  - Required as needed
- Inspections
  - Same as existing requirements

Highlights of Blasting Regulations

- Enforcement Authority
  - Same as existing requirements
- Citations
  - Same as existing requirements
- Appeals and Relief from Regulations
  - Seven (7) day time limit to file an appeal
- Penalties and other Enforcement Actions
  - Complaints may be filed with the Nevada State Contractors Board (NSCB)

Highlights of Blasting Regulations

- Definitions
  - Non-proximate vs. proximate blasting
    - **Non-Proximate Blasting.** Blasting greater than 300 feet to structure, building, utility, or public improvement
    - **Proximate Blasting.** That area containing blast holes greater than 100 feet and less than or equal to 300 feet from any structure, building, utility, or public improvements
  - Special Inspection (Applies to proximate blasting only)
    - **Special Inspection.** Inspection required by these regulations for the preparation and conducting of regulated blasting operations

Highlights of Blasting Regulations

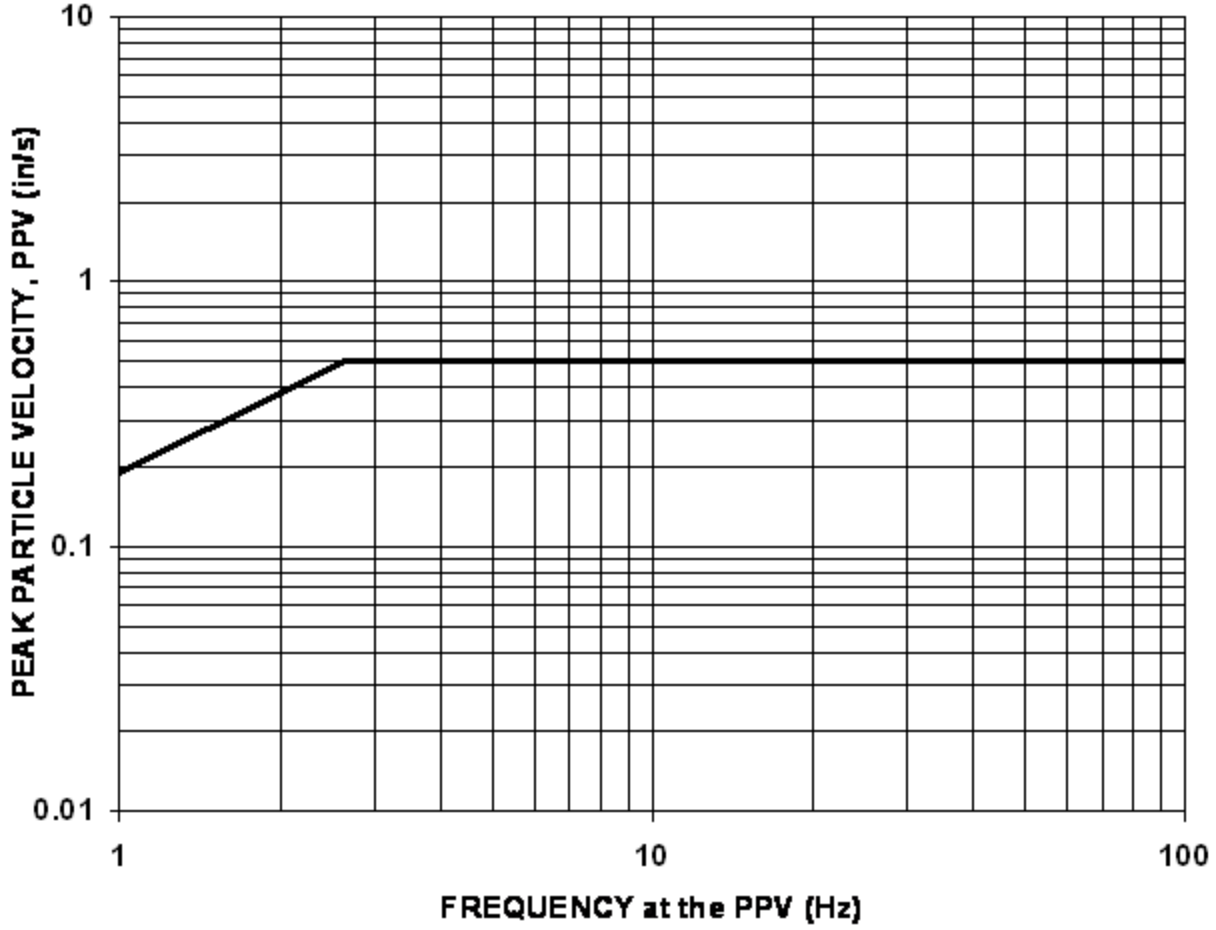
- Permits
  - General
  - Blasting Permit Required
  - Refusal to Issue Permit
  - Expiration
  - Non-transferable
  - Revocation or Suspension
  - Suspension or Revocation Hearing
  - Fees

Highlights of Blasting Regulations

- Performance Standards
  - Blast Scheduling
  - Seismograph Monitoring location (s)
  - Seismograph Monitoring Equipment
  - Ground Vibration – include Figure 1
  - Air blast
  - Fly Rock
  - Reports

Highlights of Blasting Regulations

- Figure 1



Highlights of Blasting Regulations

- Non–proximate blasting permit requirements
  - Blasting Permit
  - Application Form
  - Site maps & drawings
  - Blasting Plan
  - Seismograph monitoring plan

Highlights of Blasting Regulations

- Non–proximate blasting permit requirements (Continued from previous)
  - Traffic & access control plan
  - Notification plan
  - Proof of Insurance
    - Additional Insurance
  - Indemnification
  - Utility Notification

Highlights of Blasting Regulations

- Proximate blasting permit requirements
  - Additional requirements in addition to non-proximate blasting permit requirements
  - Pre & Post blast surveys
  - Special inspection

Additional Questions and Comments

- Questions

Next Steps

- City Council – July 19, 2005