



Site Map

Federal Regulations

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The Federal Surface Mining Control and Reclamation Act of 1977 requires that coal mine blasting be limited based on the site conditions so as to prevent: injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area. This page is provided as a resource to the people responsible for meeting this mandate.



Explosives in Use warning at the entrance to a coal mine.



Blast holes being loaded with explosives on a blasting bench

Hide All

— OSMRE Blasting Regulations

Date	OSMRE Blasting Regulations
1986	Federal Blaster Certification Program Preamble and Federal Rule (Sec 955)
1983	1983 Final Blasting Rule
1983	Surface Blasting Rules: Blast Plans (Sec 780) and Performance Standards (Sec 816)
1983	State Blaster Certification Template Rule Preamble and Template Rule (Sec 850)
1982	1982 Proposed Blasting Rule Preamble
1979	1979 Final Blasting Rule Preamble
1978	1978 Proposed Blasting Rule Preamble

1977	Surface Mining Control and Reclamation Act of 1977 - Blasting Authority
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▼ OSMRE Blaster Certificates

Date	OSMRE Blaster Certificates
	Announcement: Certified Blasters, Note the new application (OSMRE-74) and continuing education requirements (Part 16.B). List of Continuing Education Venues
2016	Federal Examination Instructions and Thumbs Blast Design 2016 (part of the test)
2016	Excel Spreadsheet - Blast Design Estimator , based on the Rules of Thumb
2015	Blaster Certificate contacts by state ; States shown in bold print , recognize the OSMRE Blaster Certificate for reciprocity
2012	OSMRE Blaster Certificate Application, OSMRE-74
2009	Directive, Reg-33, Federal Blaster Certification Program and Blasting Enforcement
2008	Blaster's Training Modules, Prepare for the test
2005	Potential Training and Testing Topics

▼ Blasting Information for Citizens

Date	Blasting Information for Citizens
2009	Blasting Vibration, Kentucky Division of Mining Reclamation and Enforcement, Explosives and Blasting Branch
2004	Blasting in Ohio's Quarries and Surface Coal Mines, Ohio Department of Natural Resources
	Citizen's Guide to Coal Mine Blasting in Indiana, Indiana Department of Natural Resources
	Citizen's Guide to Blasting, West Virginia Department of Environmental Protection Office of Explosives and Blasting
	The World of Explosives Webpage (General blasting information)
	Video from Florida Dade County: Frequently Asked Questions About Blasting
	Typical Construction Blast Videos: Blast Near Houses; City Construction; Construction Blast Video; Construction with Mats; Construction with Mats Flyrock; Good Construction with Mats; Another Good Construction with Mats; Construction with Mats
	Typical Coal-Mine Blast Videos: Conventional; Cast; Coal

▼ OSMRE Blasting Reports

Date	OSMRE Blasting Reports
2013	Lusk: Field Testing and Analysis of Blasts Utilizing Short Delays with Electronic Detonators (National) Summary; Fact Sheet; Appendix A; Appendix B
2010	Eltschlager: Federal Blaster Certificate Program (National), ISEE

2010	Lusk: Acoustic Response of Structures to Blasting Analyzed Against Comfort Levels of Residents Near Surface Coal Operations, Appendices available upon request, (National), Fact Sheet
2005	Eltschlager: Microphone Height Effects on Blast-Induced Air Overpressure Measurements (National), ISEE
2004	Eltschlager: Blasting Applications for GPS (National)
2004	Eltschlager: Fugitive Carbon Based Gases... Blasting Related or Not (National), ISEE
2003	Eltschlager: Blast Vibration and Seismograph Section 2002 (National)
2003	Aimone-Martin: Comparative Study of Structure Response to Coal Mine Blasting(National); Digital Data Download Instructions; Digital LARCOR Seismograph Field Data (zip file)
2003	Aimone-Martin, Eltschlager: Guidelines for Measuring Residential Response: Comparative Study of Structure Response to Coal Mine Blasting - Addendum II
2001	Eltschlager: Regulatory Review of Blasting Related Citizen Complaints (National)
2001	Eltschlager: Carbon Monoxide Poisoning at a Surface Coal Mine ... A Case Study (Pennsylvania)
2001	English: Study of Fugitive Dust and Fumes (West Virginia)
1997	Crum: House Response from Blast- Induced Low Frequency Ground Vibrations and Inspections for Related Interior Cracking (Indiana)
1996	Pierce: Assessment of Low Frequency Blast Vibrations and Potential Impacts on Structures (Indiana)
1994	OSMRE: Investigation of Damage to Structures in the McCutchenville-Daylight (M/D) Area of Southwestern Indiana: M/D Part 1: (Indiana)Composite Report M/D Part 2: (IDNR) Geologic and Unconsolidated Materials in the M/D Area M/D Part 3: (Eltschlager) Blast Design Effects on Ground Vibrations in M/D Indiana from Blasting at the AMAX Ayrshire Mine M/D Part 4: (Siskind) Vibration Environment and Characterization for Houses in M/D Indiana M/D Part 5: (Siskind) Racking Response of Large Structures from Airblast, A Case Study. M/D Part 6: (King) Investigation of Building Damage in the M/D, Indiana Area M/D Part 7: (Chiarito) Experimental and Analytical Studies of the Vibration Response of Residential Structures Due to Surface Mining M/D Part 8: (Hadala) Dynamic Soil Property Testing and Analysis of Soil Properties, M/D Indiana M/D Part 9: (Maynard) Environmental Conditions Related to Geology, Soils, and Precipitation M/D, Vanderburgh County, Indiana
1992	Crum: Blast Vibration Measurements at Far Distances and Design Influences on Ground Vibrations (Indiana)
1987	OSMRE: Blasting Guidance Manual (OSMRE Directive TGR-1)

State Blasting Reports

Date	State Blasting Reports
2011	WV OEB: Predictability of Airblast at Surface Coal Mines in West Virginia
2007	WV OEB: Report Relating Surface Coal Mines Scaled Distance to Deep Mine Roof Peak Particle Velocities
2006	WV-OEB: Potential Effects of Surface Mine Blasts Upon Bat Hibernaculum
2005	Henderson, NV: Structure Response Study
2005	WV-OEB: Report of Ground Vibration and Airblast Compliance Methods Research
2004	WV-OEB: Report of Seismic Research2004
2003	Mann: Response of Manufactured Houses to Blast Vibrations (Ohio)
2003	WV-OEB: Report of Seismic Research 2003
2000	Miami-Dade: Blast Vibration Damage and Assessment Study and Report
1997	PA DEP: Blasting Complaint Protocol
1995	PA: Jacobs, Assessment of the Perceived Effects of Quarry Blasting on a Suburban Residential Area

US Bureau of Mines Reports

Date	US Bureau of Mines Reports
1995	Crum: Ground Vibrations and Airblasts Monitored in Swedesburg PA from Blasting at the McCoy Quarry
1994	Siskind: RI 9523 Surface Mine Blasting near Pressurized Transmission Pipelines
1993	Siskind: RI 9455Blast Vibrations and other Potential Causes of Damage in Homes near a Large Surface Coal Mine in Indiana
1989	Siskind: RI 9226 Comparative Study of Blasting Vibrations from Indiana Surface Coal Mines
1987	Staff: IC 9135 Surface Mine Blasting
1987	Siskind: RI 9078 Low-Frequency Vibrations Produced by Surface Mine Blasting over Abandoned Underground Mines
1986	Stachura: RI 9008 Delayed Blasting Tests to Improve Highwall Stability - A Final Report
1986	Kopp: RI 9026 Effects of Millisecond-Delay Intervals on Vibration and Airblast from Surface Coal Mine Blasting
1985	Siskind: RI 8969 Blast Vibration Measurements Near and On Structure Foundations
1985	Siskind: Assessment of Blasting Vibrations from Surface Mine Blasting in Peabody's Universal Mine
1985	Siskind: The Generation of Low-Frequency Long-Duration Vibrations from Surface Mine Blasting at Blanford, IN
1984	Stagg: RI 8896 Effects of Repeated Blasting on a Wood-Frame House
1984	Stachura: RI 8892 Airblast and Ground Vibration Generation and Propagation from Contour Mine Blasting
1983	Dick: IC 8925 Explosive and Blasting Procedures Manual
1981	Stachura: RI 8508 Airblast Instrumentation and Measurement Techniques for Surface Mine Blasting
1980	Siskind: RI 8485 Structure Response and Damage Produced by Airblast from Surface Coal Mining
1980	Stagg: RI 8506 Measurement of Blast-Induced Ground Vibrations and Seismograph Calibration
1980	Siskind: RI 8507 Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting
1977	Damon: IC 8746 Safety Recommendations for Sensitized Ammonium Nitrate Blasting Agents
1974	Snodgrass: RI 7937 Vibrations from Underground Blasting
1972	Pugliese: IC 8550 Designing Blast Patterns Using Empirical Formulas
1971	Nicholls: Bulletin 656 Blasting Vibrations and Their Effects on Structures
1966	Devine: RI 6774 Effect Of Charge Weight On Vibration Levels From Quarry Blasting
1966	Dolah: RI 6746 Sympathetic Detonation Of Ammonium Nitrate And Ammonium Nitrate Fuel Oil
1966	Dolah: RI 6773 Explosion Hazards Of Ammonium Nitrate Under Fire Exposure
1966	Nicholls: RI 6806 Effect Of Charge Diameter On Explosive Performance
1966	Nicholls: RI 6843 Presplitting Rock In The Presence Of A Static Stress Field
1966	Dolah: RI 6903 Further Studies On Sympathetic Detonation
1963	Duvall: RI 6151 Vibrations From Instantaneous and Millisecond-Delayed Quarry Blasts
1963	Staff USBM: IC 8179 Safety Recommendations for Sensitized Ammonium Nitrate Blasting Agents
1963	Johnson: RI 6188 Effects of Mechanical Properties of Materials on Cratering: A Laboratory Study
1962	Duvall: RI 5968 Review of Criteria for Estimating Damage to Residences from Blasting Vibrations
1954	Blair: RI 5073 Evaluation of Gages for Measuring Displacement, Velocity and Acceleration of Seismic Pulses
1942	Thoenen: Bulletin 442 Seismic Effects of Quarry Blasting
1942	Ireland: TP 635 Design of Air-Blast Meter and Calibration Equipment

1936	Lee: RI 3319 Earth Vibrations Caused by Quarry Blasting
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Historic Structures and Other Blast Vibration Reports

Date	Historic Structures and Other Blast Vibration Reports
2012	Wilson, Ihrig Associates, Inc.: Current Practices to Address Vibration and Potential Effects to Historic Buildings Adjacent to Transportation Projects
2007	Sharif: Non-Destructive Testing of Historic Structures to Establish Vibration Criteria
2001	Hagherty, Harrell: Blasting Vibrations Affected by Underground Cavities
2000	Siskind: Assessment of Blast Vibration Impacts from Quarry Blasting in Dade County
1989	Shaw: Evaluation of Potential Blasting-Induced Damage to the Meason House
1983	Clark: Vibration and Its Effect and Measurement Techniques at or Near Dwellings
1983	ASCE: Vibration Criteria for Historic and Sensitive Older Buildings
1977	Medearis: Rational Damage Criteria for Low-Rise Structures Subjected to Blasting Vibrations
1963	Northwood: Blasting Vibrations and Building Damage
1960	Edwards: Experimental Studies of the Effects of Blasting on Structures

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Training Aids, PowerPoint Presentations and Movies

Date Posted	Training Aids, PowerPoint Presentations and Movies
2014	Blasting Gases and Safety, 2013
2012	OSMRE Blasting Responsibilities, ISEE 2011
2011	GPS ISMR 2011
2010	House contents response videos; Quarry: Boonville
2009	USGS Stray-Gas Workshop, CO/blasting Presentation
2009	NTTP Blasting and Inspection Class (zip file 460MB)
2009	GPS Training Module
2007	OSMRE Blaster's Training Modules, Part 8
2007	Vibration Monitoring, FY07, ATF CES
2007	FY07 Presentation, Understanding the Vibration Measurement
2006	OSMRE Responsibilities, FY07, ATF AETI
2006	ISEE Blast Vibration and Seismograph Section update, ISEE BVS 2005
2005	OSMRE TIPS Blast Log Evaluation Program Primer 2005, BLEP Class
	Northwestern University, Autonomous Crack Measurement Webpage
	Southern Methodist University, Geophysics Research Archives (Good video clips)
	e-Training: Blast Log Evaluation Program Instructions; BLEP primer

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Searchable Websites

Date Posted	Searchable Websites
2017	The World of Explosives
2012	NIOSH, Safety and Health Topics and Explosives Downloadable Publications
2010	USGS's website - monitors seismic activity related to mining blasts

2005	International Society of Explosives Engineers (ISEE)
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Blast Monitoring Guidelines

Date	Blast Monitoring Guidelines
2015	2015 ISEE Field Practice Guidelines for Blasting Seismographs
2003	Aimone-Martin, Eltschlager: Guidelines for Measuring Residential Response, Comparative Study of Structure Response to Coal Mine Blasting - Addendum II
1991	USACE: Underwater Blast Monitoring

Vibrations and Underground Mines

Date	Vibrations and Underground Mines
2007	WV OEB Report Relating Surface Coal Mines Scaled Distance to Deep Mine Roof Peak Particle Velocities
2006	VibraTech: Howe Cave Quarry Study, NY
2002	Singh: Impact of Initiation Sequences in Opencast Blasting on the Intensity of Vibrations in Underground Openings
1997	Scoble, Lizotti, Paventi, Mohanty: Measurement of Blast Damage
1993	Fourie, Green: Damage to Underground Coal Mines Caused by Surface Blasting
1993	Singh, Lamond: Investigation of Blast Damage and Underground Stability
1992	Boukharov, Chanda: A Theoretical Study into Damage to Pillars Caused by Blasting
1991	Friedel, Thill: RI 9389, Rayleigh Wave Assessment of Damage and Integrity of Mine Structures
1984	Simpson, Phang: Effects of Surface Mine Blasting on Underground Mine Openings
1983	Phang, Simpson, Brown: Investigation of Blast-Induced Underground Vibrations from Surface Blasting
1979	Woodward-Clyde Associates: Underground Vibrations from Surface Blasting at Jenny Mine, Kentucky
1979	Hayatdavoudi, Brown: Surface Coal Mine Blasting Effects on Underground Coal Mine Stability
1977	Stevens: A Review of the Effects of Earthquakes on Underground Mines, USGS
1977	Sakurai: Vibration of Tunnel to Adjacent Blasting Operations
1977	Rupert, Clark: Criteria for the Proximity of Surface Blasting to Underground Coal Mines
1974	Snodgrass, Siskind: Vibrations from Underground Blasting

Vibrations and Slope Stability

Date	Vibrations and Slope Stability
2010	MSHA Impoundment Seminar presentations: Earthquakes vs Blasting, Clark Blasting Effects on Impoundments, Pfeifer
2009	MSHA: Engineering and Design Manual Coal Refuse Disposal Facilities, Blasting Chapters; Full manual
2007	MSHA: Coal Mine Impoundment Inspection and Plan Review Handbook
2001	Sharif, Warner, Novotny: Vibration Monitoring Program for McConnell's Mill State Park
1994	Andrieux, McKenzie, Heilig, Drolet: The Impact of Blasting on Excavation Dedsign - A Geomechanics Approach
	Jibson: Predicting Earthquake-Induced Landslide Displacements Using Newmark's Sliding Block

1993	Analysis
1985	US Bureau of Reclamation: Review of Present Practices Used in Predicting the Effects of Blasting on Pore Water Pressure
1982	Oriard: Influence of Blasting on Slope Stability - State-of-the-Art
1981	Holmberg, Maki: Case Examples of Blasting Damage and Its Influence on Slope Stability
	Gandhi, Densification of Deposited Ash Slurry

Flyrock

Date	Flyrock
1993	Shea and Clark: Avoiding Tragedy: Lessons to be Learned from a Flyrock Fatality
1979	Management Science, Assoc., A Model for the Determination of Flyrock Range as a Function of Shot Conditions

Vibrations and Pipelines

Date	Vibrations and Pipelines
1994	Siskind: RI 9523 Surface Mine Blasting near Pressurized Transmission Pipelines
1991	Esoaraza: Pipeline Response to Blasting in Rock
1978	Westine: Analysis and Testing of Pipe Response to Buried Explosive Detonations
1976	Clark: Relationship Between Pipe Stress, Ground Particle Velocity and Scale Factors in Blasting Dolomite

Vibrations and Water Wells

Date	Vibrations and Water Wells
2002	Stephens and Assoc., Comparative Study of Domestic Water Well Integrity
2000	Hawkins: Impacts off Blasting on Domestic Water Wells
1996	Revey: Practical Methods to Control Explosives Losses and Reduce Ammonia and Nitrate Levels in Mine Water
1980	Berger: Survey of Blasting Effects on Ground Water Supplies in Appalachia

Army - Demil and Propellants Use

Date	Army - Demil and Propellants Use
2011	Ammunitions and Explosives Safety Standards, Department of the Army, Pamphlet 385-64
1998	Propellant Management Guide, U.S. Army Defense Ammunition Center
1994	TNT Equivalence of Selected U.S. Army Gun Propellants, Naval Surface Warfare Center
1993	Prediction of Safe Life of Propellants, Feltman Research Laboratory

Abandoned Mine Land (AML) Blasting Reports

Date	Abandoned Mine Land (AML) Blasting Reports
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1991	Caulder, Workman: Blasting for Abandoned Mine Land Reclamation
1987	Bauer, Caulder, Workman: Blasting as an AML Reclamation Method Volume 1; Volumne 2

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Blasting Dissertations and Theses (from our upcoming professionals)

Date	Blasting Dissertations and Theses (from our upcoming professionals)
2012	Silva-Castro: Blast Vibration Modeling Using Improved Signature Hole Technique for Bench Blast
2006	An Lusk: Analysis and Policy Implications of Comfort Levels of Diverse Constituents with Reported Units for Blast Vibrations and Limits: Closing the Communication Gap, 2006
2006	Waldron: Residential Crack Response to Vibrations from Underground Mining, 2006
2005	Rosenhaim: Response of a Residential Structure and Buried Pipelines to Construction Blasting in Basalt on the West Side of Albuquerque, NM, 2005, Thesis
2005	Ozer: Wireless Sensor Networks for Crack Displacement Measurement, 2005

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International Blasting Reports

Date	International Blasting Reports
2007	Adhikari: Ground Vibration and Structure Response Due to Rockbursts at Kolar Gold Fields (India)
2005	Adhikari: Role of Blast Design Parameters on Ground Vibration and Correlation of Vibration Level to Blasting Damage to Surface Structures (India)
2001	Ministry of Coal: Evaluation of Explosives Performance Through in-the-Hole Detonation Velocity Measurement (India)
1977	Sakurai and Kitamura: Vibration of Tunnel Due to Adjacent Blasting Operation (Japan)

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Mine Gases and Dust

Date	Mine Gases and Dust
2012	Battelle, West Virginia Air Quality Assessment Near a Surface Coal Mine Blasting Operation, Press Release; and Report
2010	USGS: Stray Gas Workshop, November 2009
2007	Attalla, et al: NOx Emissions from Blasting in Open Cut Coal Mining in the Hunter Valley, Australia
2003	NIOSH: Handbook for Dust control in Mining
2003	Laughrey, Baldassare: Some Applications for Isotope Geochemistry for Determining Sources of Stray Carbon Dioxide Gas
2001	English: Study of Fugitive Dust and Fumes (West Virginia)
2001	Eltschlager et al: Technical Measures for the Investigation and Mitigation of Fugitive Methane Hazards in Areas of Coal Mining

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GPS

Date	GPS
2004	Eltschlager: Blasting Applications for GPS (National)
2004	Eltschlager: Presentation Blasting Applications for GPS

Excel Tools

Date	Excel Tools
2016	OSMRE Blast Design Rules of Thumb Excel Calculator; Rules of Thumb (2016)
2014	OSMRE Regression Analysis for Ground Vibrations and Airblast
2009	PA Airblast Prediction
2009	PA Ground Vibration Prediction
2009	OSMRE Blast Report
2009	Drill logs: OSMRE VA Drilling and Blasting
2009	OSMRE Blast Log Evaluation Program, BLEP
2009	OSMRE Charge Weight/Scaled Distance Table
2009	OSMRE Airblast Calculator
2009	OSMRE Wind Conversion
2009	OSMRE Latitude - Longitude Distance Calculator
2009	OSMRE Scaled Distance - PPV Graph
2009	US Bureau of Mines RI 8507 Appendix B
2009	OSMRE Alternate Blasting Level Chart, from RI 8507

Public Relations

Date	Public Relations
2007	ISEE 2007: Public Meetings Guide (zip file)
2005	ISEE: PR at the Doorstep, Part 1; Part 2; Part 3 (contact the author for imbedded videos)

For More Information:
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