

**East Hanover Township, Dauphin County
Ordinance No. 2010-03**

Explosives and Blasting

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Sec. 1. Purpose.

(a) The purpose of this ordinance is to regulate the use of explosive materials and to establish uniform limits on permissible levels of blasting resultants to reasonably ensure that blasting resultants do not cause injury, damage, or a nuisance to persons or property. The standards established herein apply to the detonation of explosives used to fragment ore or minerals for mining, quarrying, excavation and construction within East Hanover Township (“EHT”). This ordinance applies to all activities and quarry and mining operations existing at this ordinance’s adoption and all such operations beginning after this ordinance’s adoption.

(b) Conflict with this Ordinance, Pennsylvania statutes or regulations. The EHT Board of Supervisors (“Supervisors”) may, in its sole discretion, issue conditional use permits for individual blasting projects that contain provisions specific to that individual project. If the provisions of the conditional use permit regulating environmental activities exceed the requirements of this ordinance, Pennsylvania Department of Environmental Protection (“DEP”) regulations, and/or any other applicable state or federal regulations or statutes, the provisions of the conditional use permit shall control. If the provisions of the conditional use permit regulating environmental activities are less strict than those of this ordinance, DEP regulations, and/or any other applicable state or federal regulations or statutes, those statutory and/or administrative code provisions shall control to the extent that they exceed the provisions of the conditional use permit provisions. However, if the provisions of the conditional use permit that regulate non-environmental activities differ from those found in this ordinance, those provisions of the conditional use permit shall control. Examples of conditions which regulate non-environmental activities include, but are not limited to, hours of operation, blasting logs, enforcement provisions, complaints of violations, records of operation, renewal of permits, inspection, and right of access.

Sec. 2. Definitions.

The following definitions shall apply in this chapter. Terms not herein defined shall be understood to have their usual and ordinary dictionary meaning.

(a) *Airblast* means an airborne shock wave resulting from the detonation of explosives.

(b) *Approved* means approval granted by EHT.

(c) *Blaster* means any individual holding a valid blaster’s license issued by the Commonwealth of Pennsylvania.

(d) *Blasting business* means any operation, enterprise or activity involving the use of blasting.

(e) *Blasting* means any method of loosening, moving or shattering masses of solid matter by use of an explosive.

(f) *Blasting operation* means any operation, enterprise, or activity involving the use of blasting.

(g) *Blasting resultants* means the physical manifestations of forces released by blasting, including, but not limited to, projectile matter, vibration, and concussion, which may cause injury, damage, or unreasonable annoyance.

(h) *Community* means a built-up inhabited area.

(i) *Detonator* means any device containing a detonating charge that is used for initiating detonation in an explosive. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord delay connectors, and non-electric instantaneous and delay blasting caps.

(j) *Department* means the Pennsylvania Department of Environmental Protection.

(k) *EHT* means East Hanover Township, Dauphin County, Pennsylvania.

(l) *Electric blasting cap* means a blasting cap designed for and capable of initiation by means of an electric current.

(m) *Explosion* means the substantially instantaneous release of both gas and heat.

(n) *Explosive* means any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion unless the compound, mixture, or device is otherwise classified by the Department by rule.

(o) *Explosive materials* means explosives, blasting agents, and detonators. The terms includes, but is not limited to, dynamite and other high explosives, slurries, emulsions, water gels, blasting agents, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, and igniters.

(p) *Flyrock* means rock that is propelled through the air from a blast.

(q) *Ground vibration* means a shaking of the ground caused by the elastic wave emanating from a blast.

(r) *Highway* means any public street, public alley, or public road.

(s) *Inhabited building* means a building regularly occupied in whole or in part as a habitation for human beings or domesticated animals or any church, schoolhouse, railroad station, store, places of employment, or other structure where people are accustomed to assemble, except any building or structure occupied in connection with the manufacture, transportation, storage, or use of explosive materials.

(t) *Mine* means an excavation in the earth from which ore or minerals can generally be extracted without crushing or blasting.

(u) *Mineral* means a naturally occurring, inorganic solid substance that is extracted or obtained from the earth.

(v) *Mining* means to obtain ore or minerals from a quarry, as by crushing, blasting or excavating.

(w) *Nuisance* means an excessive, repeated noise, odor, dust, vibration, action, or other disturbance that would cause an unreasonable annoyance to a person or domesticated animal, a physical injury to or an interference with the real or personal property or an interest in the real or personal property of a person.

(x) *Ore* means a mineral or an aggregate of minerals.

(y) *Particle velocity* means any measure of ground vibration describing the velocity at which a particle of ground vibrated when excited by a seismic wave.

(z) *Parties in interest* means the blaster and blasting business and all owners of property located within at least one-half (1/2) mile of the boundaries of a blasting site.

(aa) *Permitted explosives use area* means the area that surrounds a blasting site and

(1) Is owned by the operator; or

(2) With respect to which, because of property ownership, employment relationship, or agreement with the property owner, the operator can take reasonably adequate measures to exclude or to ensure the safety of persons and property.

(bb) *Person* means any individual, corporation, company, association, firm, partnership, society, or joint stock company.

(cc) *Powder factor* means any ratio between the amount of powder loaded and the amount of rock broken.

(dd) *Primer* means a capped fuse, electric detonator, or any other detonating device inserted in or attached to a cartridge of explosive.

(ee) *Quarry* means an open excavation or pit from which ore or minerals are obtained by mining.

(ff) *Site* means the entire property owned or operated in which the quarry or mine is located; where measurements of distance are involved, said measurements shall begin at the boundaries of the property.

(gg) *Stemming* means the inert material, such as drill cutting, used in the collar portion or elsewhere of a blast hole to confine the gaseous products of detonation.

Sec. 3. Regulation of Explosive Materials and Blasting

(a) General. No person shall handle or use explosive materials in EHT unless he/she:

(1) Possesses a valid Commonwealth of Pennsylvania blasters license with the proper classification or is supervised by a holder of a valid Commonwealth of Pennsylvania blasters license with the proper classification; and

(2) Possesses all necessary permits and complies with all applicable local, state, and federal regulations and statutes.

(b) Permit. No person shall handle, use or cause explosives to be detonated within EHT without an explosives use permit issued by EHT, as hereafter set forth, to such person, his supervisor or employer:

(1) Application. Applications for an explosives use permit shall be in writing upon forms provided by EHT. Applications shall be accompanied by a two hundred dollar (\$200) permit fee. Permits shall be issued on an annual basis commencing January 1, and ending on December 31. All explosives use permits applied for after January 1 shall be prorated from the date of the issuance of the permit through the end of the year. Applications may be made by and permits issued to the blasting business provided that the person doing the blasting or responsible for such blasting shall hold a valid Pennsylvania blasters license and proper classification. The applicant will identify the licensed blasters operating under the permit and the blasting locations with the EHT.

Renewal. All applications for re-issuance and renewal of an explosives use permit shall be filed by the permittee with EHT within sixty (60) days before the expiration date of the previous permit, along with the annual two hundred dollars (\$200) permit fee. No permit renewal shall be granted unless the project is in complete compliance with the terms of the existing permit. Permit renewals may be conditioned upon correction of any unanticipated environmental impacts occurring during the original or renewal periods.

(2) Certificate of Insurance. Each application for an explosives use permit as herein stated or a renewal thereof shall be accompanied by a Certificate of Insurance for a Commercial General Liability Policy and said Policy of Insurance shall have limits of coverage of not less than five million dollars (\$5,000,000) in the aggregate and five hundred thousand dollars (\$500,000) per occurrence, and EHT shall be named as an additional insured on applicant's Policy of Liability Insurance.

(3) Explosives Use Plan. Each application for an explosives use permit or a renewal thereof shall include a written description of the total area within which explosives are proposed to be used, blasting procedures to be employed, including

types of explosives, initiating systems, and an aerial photograph or drawing acceptable to EHT with a scale of not less than one (1) inch equals four hundred (400) feet and having an overlaying grid of fifty (50) feet by fifty (50) feet which accurately includes all areas and inhabited buildings within one quarter (1/4) mile of all proposed blasting areas.

(4) Hours of Operation. Blasting shall only be conducted between 9:00 a.m. and 4:00 p.m. on Monday through Friday provided; however, that, in the event an emergency has delayed a blast beyond 4:00 p.m., loaded holes may be blasted within a reasonable time thereafter but not later than 5:00 p.m. that day. Blasting shall not be conducted at other times or on Saturdays, Sundays, or legal holidays without written permission from EHT, which shall only be granted upon a showing of extreme need.

(5) Blasting Log. An accurate blasting log shall be prepared and maintained for each blast fired, and a true and complete copy of said log shall be supplied to EHT within seven (7) working days of the initiation of the blast. EHT may require that the permittee furnish it an analysis of any particular blasting log to be prepared by the permittee. In the event the permittee cannot or will not prepare a reliable analysis, EHT may hire and obtain such analysis from an independent expert. The permittee shall be liable for the reasonable cost of such analysis. Each blasting log shall include, at a minimum, the following information:

- a. Name and license number of blaster in charge of blast.
- b. Blast location with grid coordinate references to the supplied aerial photograph or drawing of the explosives use area.
- c. Date and time of blast.
- d. Weather conditions at time of blast.
- e. Diagram and cross-section of blast hole layout.
- f. Number of blast holes.
- g. Blast hole depth and diameter.
- h. Spacing and burden of blast holes.
- i. Maximum holes per delay.
- j. Maximum pounds of explosives per delay.
- k. Depth and type of stemming used.
- l. Total pounds of explosives used, including primers and initiating cord.

- m. Distance to nearest inhabited building not owned by permittee.
- n. Type of initiation system used.
- o. Seismographic and airblast information, which shall include:
 - i. Type of instrument and last calibration date.
 - ii. Exact location of instrument and date, time and distance from the blast.
 - iii. Name and company affiliation of person taking reading.
 - iv. Name of the person and firm analyzing the seismographic and airblast data when required.
 - v. Vibrations and airblast levels recorded.
 - vi. Copy of the seismograph printout.

(6) No permittee shall be required to obtain more than one (1) permit annually for its operation within EHT for any single project.

Sec. 4. Temporary Permits.

EHT, upon receipt of a properly completed temporary permit application form, may issue a temporary permit to allow for special construction or demolition activities requiring the use of explosives. Temporary permits shall be issued for a duration of fourteen (14) consecutive days. The temporary permit fee shall be one hundred dollars (\$100) and shall be submitted with the completed temporary permit application form. Only one (1) temporary permit can be issued for any given site or blaster within the year of permit issuance.

Sec. 5. Regulation of Blasting Resultants.

(a) Purpose of Section. It is the purpose of this section to provide for the establishment of uniform limits on permissible levels of blasting resultants to reasonably ensure that blasting within EHT does not cause injury, damage, or a nuisance to persons or property outside and beyond the permitted explosives use area.

(b) Instrumentation. All blast-monitoring instruments used to produce data to support compliance with this subsection shall meet the following minimum specifications:

- (1) Seismic frequency range. 2 to 200 Hz (+/- 3Hz).

- (2) Acoustic frequency range. 2 to 200 Hz (+/- 1dB).
- (3) Velocity range. 0.02 to 4.0 inches per second.
- (4) Sound range. 100 to 140dB linear.
- (5) Transducers. Three (3) mutually perpendicular axes.
- (6) Recording. Provide time-history of wave-form.
- (7) Printout. Direct printout showing time, date, peak air pressure, peak particle velocity, and frequency in three (3) directions and a printed wave-form graph of the event depicting measured air blast and particle velocity in the three (3) directions.
- (8) Calibration. At least once every twelve (12) months, according to manufacturer's recommendations.

(c) Control of Adverse Effects.

- (1) General Requirements. Blasting shall be conducted so as to prevent injury or nuisance to persons and damage to public or private real or personal property outside the permitted explosives use area.
- (2) Airblast. Limits. Airblast shall not exceed the following limits at the location of any dwelling, public building, place of employment, school, church, community, or institutional buildings outside and beyond the permitted explosives use area.

| <u>Lower Frequency Limit of Measuring System in Hz</u> | <u>Maximum Level in dB</u> |
|--|----------------------------|
| 2 Hz or lower – flat response | 133 peak |
| 6 HZ or lower – flat response | 129 peak |

(d) Ground Vibration. General.

- (1) The maximum ground vibration at the location of any dwelling, public building, place of employment, school, church, community, or institutional building outside the controlled blasting site shall be established in accordance with either the maximum peak particle velocity limit (see Table 1) or the scaled-distance (see Table 2), whichever is applicable and yields the lowest permissible maximum ground vibration.

- (2) All structures in the vicinity of the blasting area not listed in para. d. 1 (such as water towers, pipelines and other utilities, tunnels, dams, impoundments, landfills or other solid waste disposal facilities, and underground mines) shall be protected from damage by establishment by the operator of a maximum allowable limit on the ground vibration. The operator shall establish the limit after consulting with the owner of the structure. Such limits shall be subject to change by order of EHT subsequent to a due process hearing requested by any interested person.

Maximum peak particle velocity. An operator may use the maximum ground vibration limits listed in Table 1.

Table 1 – PEAK PARTICLE VELOCITY LIMITS

| Type of Structure | Maximum in allowable peak particle velocity for ground vibration, in/sec | |
|--|--|----------------------------------|
| | At frequencies below 40 Hz* | At frequencies 40 Hz And greater |
| Modern homes and structures with drywall interiors | 0.75 | 2.0 |
| Older homes and structures with plaster on wood lath construction for interior walls | 0.30 | 2.0 |

* All spectral peaks within 6 dB (50 pct) amplitude of the predominant frequency must be analyzed.

- (3) Ground vibration shall be measured as the particle velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity shall apply to each of the three measurements and the vector sum of the three measurements.
- (4) A seismographic record shall be provided for each blast.
- (e) Scaled-distance equation.
- (1) An operator may use the scaled-distance equation, $W = (D/D_s)^2$, to determine the allowable charge-weight of explosives to be detonated in any 8-millisecond period without seismic monitoring where W = the maximum weight per delay of explosives, in pounds; D = the distance, in feet, from the blasting site to the nearest structure listed in para. d.1; and D_s = the scaled-distance factor listed in Table 2.

- (2) The development of a modified scaled-distance factor may be authorized by EHT on receipt of a written request by the operator and supported by seismographic records of blasting at the site. The modified scaled-distance factor shall be determined such that the particle velocity of the predicted ground vibration will not exceed the prescribed maximum allowable peak particle velocity in Table 1 at a 95 percent confidence level.

Table 2
SCALED-DISTANCE FACTOR LIMITS

| Distance from the blasting | Scaled-distance factor (D_s) to be applied without seismic monitoring |
|-----------------------------------|--|
| 0-300 | 50 |
| 301 to 5,000 | 55 |
| 5,001 and beyond | 65 |

(f) Dust Emissions. The Permittee shall take all steps necessary to minimize, as much as possible, the visible emissions from the project. This also shall apply to all quarry-related operations, including, but not limited to, blasting, crushing, and transportation of quarry materials. Permittee shall comply with all applicable statutes and regulations. Permittee shall provide to EHT a fugitive dust control plan. Preventative dust suppression methods may be necessary to comply with this condition. Dust suppression methods shall include, but not be limited to, the following.

- (1) Paving, chip sealing, or covering with calcium chloride (or such other methodology as may be approved by EHT) the driveway into the quarry.
- (2) The tires of all vehicles engaged in ingress or egress from a quarry site shall be clean or cleaned completely to prevent the tracking of material outside of the quarry site.
- (3) Posting and maintenance of a 10-mph speed limit on paved or unpaved roads or other areas used by haul trucks inside the quarry property line.
- (4) Covering, treatment, or securing of materials likely to become airborne from haul trucks during transport and prior to any transportation offsite from the quarry.
- (5) Use of wet drilling or other means of control approved by the DEP.
- (6) Use of approved blast hole stemming materials.

- (7) An electronically powered anemometer shall be installed at the highest practical point on the project property. The wind speed shall be monitored before loading a blasting charge. If the wind speed equals or exceeds 10 mph or 16.09 KM/hr, the charge shall not be loaded, and blasting shall not take place. Permittee shall keep a log of wind speed readings taken before each blast and shall produce said log to EHT upon request.

Sec. 6. Monitoring.

(a) Monitoring.

- (1) The Permittee shall monitor all blasts at the closest location of the blast of any dwelling, public building, place of employment, school, church or community or institutional building outside and beyond the permittee explosives use area provided, however, that the permittee may monitor at another location approximately the same distance from the blast site if the permittee is unable to obtain permission to conduct the monitoring from the owner of the preferred location. EHT or its designee may, at its discretion, require the relocation of monitoring equipment to a more suitable site and/or may conduct independent air-blast monitoring to spot-check data supplied by the permittee. If independent monitoring by EHT discloses that the ordinance was violated by the permittee, then, in that event, the permittee shall pay the reasonable costs incurred by EHT for the independent monitoring.
- (2) The measuring equipment used shall have an upper end flat frequency response of at least two hundred (200) Hz.
- (3) All measuring equipment during monitoring shall be spiked to the ground or sandbagged.

(b) Flyrock. Flyrock produced as a result of explosives use shall be totally contained within the permitted explosives area.

(c) Seismic Monitoring. EHT may, at its discretion, conduct independent seismic blast monitoring to spot-check data supplied by the permit holder. If the independent monitoring discloses that the permit holder supplied data is inaccurate or that the ordinance was violated, the permit holder must pay the cost incurred by EHT for the independent monitoring.

Sec. 7. Preblast Survey and Notification.

(a) Preblasting Notification.

Each explosive use permit application and all reapplications shall include the names and addresses of all residents or owners of dwellings or other structures or any other parties

of interest located within at least one-quarter (1/4) mile of the boundaries of the blasting site.

(b) At the time of permit application, the applicant shall have notified, in writing, all residents or owners of dwellings or other structures located within the previously defined area of one-quarter (1/4) mile, who may request a preblast survey and a water quality test for existing wells. This request shall be in writing. The applicant shall cause a preblast survey to be conducted as to such dwelling or structures and water quality testing for existing wells, provided, however, that the applicant shall not be required to conduct a preblast survey or well water quality testing more than once every six (6) years as to any dwelling, structure, or well. A change of ownership of a property would justify a request of a preblast survey to be conducted before the six-year limit.

(c) The owner of a dwelling or structure that is within one-quarter (1/4) mile of the blasting site, which subsequent to the conducting of a pre-blast survey has been modified to the extent that a building permit is required, may request a preblast survey. If it is found that a preblast survey for such improved or modified structure is appropriate, the applicant/permittee may conduct such surveys within a reasonable period of time but in no case exceeding twice a year for all such requests by all owners.

(d) The preblast survey and water quality testing shall be promptly conducted in a manner and form and by an independent survey company, a laboratory approved by the Commonwealth of Pennsylvania or organization selected by the applicant and acceptable to the owner or resident and EHT. The survey shall determine the condition of the dwelling or structure and shall document any pre-blasting damage or other physical factors that could reasonably be expected to be affected by the use of explosives. The testing of wells shall determine the condition of the water as to be safe for human use. EHT may consider accepting a blasting survey or well water test that was prepared prior to the effective date of this ordinance if the blasting survey and well water test meets the requirements outlined herein.

(e) The survey shall include a written report signed by the person who conducted the survey. Copies of the survey report shall be promptly provided to EHT, the owner or resident, and the applicant/permittee. The owner, resident or applicant/permittee shall promptly submit in writing to EHT any objections to the survey report, setting forth in detail such objections.

(f) The water quality test for existing wells shall include a written report signed by the person who conducted the test. Copies of the test shall be promptly provided to EHT, the owner or resident, and the applicant/permittee. The owner, resident or applicant/permittee shall promptly submit in writing to EHT objections to the test, setting forth in detail such objections.

(g) Reasonable and reasonably related expenses incurred as a result of such independent surveys shall be the responsibility of the applicant/permittee.

Sec. 8. Enforcement and Penalty Provisions.

(a) Enforcement. The following are criteria that EHT may consider for issuance, re-issuance, suspension, or revocation of a blasting permit:

1. Compliance with the blasting standards established by EHT as noted herein by this ordinance.
2. Development and submittal to EHT of the explosives use plan and compliance with the explosives use plan.
3. Development and submittal to EHT the blasting log and compliance with the operation plan with the information called for by the blasting log.
4. Maintaining the financial assurance required by EHT.
5. Compliance with the operational hours for blasting as noted herein by this ordinance.
6. Compliance with airblast and ground vibration standards established by EHT as noted herein by this ordinance.
7. Compliance with the pre-blasting notification requirements to residents and EHT as noted herein by this ordinance.
8. Attempts made by the permittee or party in interest to comply with the provisions of this ordinance.
9. Consideration of atmospheric, unknown conditions, including geographical considerations, and other matters beyond the control of the permittee or party in interest.
10. Any other relevant evidence.

(b) Suspension/Revocation. Unless expressly provided herein or by other EHT Ordinance provisions, the explosive use permit may be suspended or revoked for cause for noncompliance with the ordinance after the proper EHT hearing noted below, unless in an emergency condition determined by EHT wherein the license or permit can be suspended temporarily for a set time-period. Prior to any action for suspension or revocation, EHT must have received a verified complaint concerning the licensee or permittee. The following persons may file a verified complaint with EHT.

1. A member of the EHT Board of Supervisors
2. The EHT Zoning Officer
3. The EHT Engineer

4. Any aggrieved EHT resident
5. Any landowner whose property is located within one quarter mile (1320 feet) of the blasting site.

EHT will make a determination if the allegations of the complaint are of sufficient magnitude, importance, or otherwise of such a nature as to require a formal evidentiary hearing.

The person subject to charges for violation of this ordinance or any violation of a condition of an explosives use permit shall be provided a copy of the verified complaint and notice of hearing before the EHT Board of Supervisors. The hearing shall be required to be not less than ten (10) days nor more than thirty (30) days after receipt of notice, unless otherwise stipulated in writing by EHT and the person subject to charges.

The person subject to charges for violation of this ordinance or any violation of a condition of an explosives use permit shall be entitled to the following:

1. Representation by legal counsel
2. Right to present and cross-examine witnesses
3. Right to subpoena witnesses by EHT issuing subpoenas to compel attendance of witnesses

EHT, after the hearing for any person previously issued an explosives use permit by EHT, may act as follows:

1. Revoke the permit as a final decision
2. Suspend the permit for a number of day, weeks, or months until the date certain as a final decision
3. Request additional information as an interim decision prior to taking future action
4. Take no action on the permit as a final decision.

The final decision of EHT to revoke or suspend the explosives use permit shall be subject to appeal to the Dauphin County Court of Common Pleas.

(c) Penalty. In addition to the denial, suspension, or revocation of a permit issued under this chapter, any person who shall be found to be in violation of any provision of this ordinance or who shall fail to obtain a permit as required hereunder shall upon conviction of such violation be subject to a penalty of not less than Twenty Dollars (\$20) nor more than Five Hundred Dollars (\$500) per violation, together with the costs of prosecution which include all statutory costs plus the actual attorney's fees incurred by EHT in pursuit of such prosecution of any such violation(s).

Each violation and each day a violation continues or occurs shall constitute separate offenses. Nothing in this chapter shall preclude EHT from maintaining any appropriate action to prevent or remove a violation of any provision of this chapter.

ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT HEREWITH ARE HEREBY REPEALED.

SEPARABILITY OF CHAPTER PROVISIONS. If any section, subsection, sentence, clause, or phrase of the Ordinance is for any reason held to be invalid or unconstitutional by reason of any decision of any court of competent jurisdiction, such decision shall not affect the validity of any other section, subsection, sentence, clause or phrase or portion thereof. EHT hereby declares that it would have passed this chapter and each section, subsection, sentence, clause, phrase or portion thereof irrespective of the fact that any one or more section, subsection, sentence, clause, phrase or portion may be declared invalid or unconstitutional.

This ordinance shall take effect upon its approval and the day after publication.