To answer the December 16 question from Commissioner Miello, quartz and silica are the same thing, as is glass. Chemically, they are all silicon dioxide. Glass is the amorphous form of the mineral, quartz is the crystalline form. There are two types of rock to be quarried, alaskite gneiss (pink) and granitic gneiss (gray). The latter is located underneath the former in the mountain. This exhibit focuses of the composition of only the alaskite gneiss.

Exhibit #11 from the first series of hearings, geological report November 21, 2022:

1.1 Submittal

This report summarizes the geology and general operational information of the Gales Ferry Intermodal, (GFI) Gales Ferry Quarry, located approximately 1.0 miles north of the Village of Gales Ferry, Town of Ledyard, Connecticut (New London County). The report and supporting data is being submitted in

Hope Valley alaskite gneiss [HVAG] shaded gray in the portion of the Uncasville bedrock map at right, is found in various locations in southeastern New England, on avalonian terrain bedrock. The arrow in the center of the screen capture at right indicates the area on the south slope of Mount Decatur where samples were taken that were submitted as an exhibit, and shown in the images in this exhibit. The scale in the photo of one of the samples shown on the next page is millimeters.

The rock is predominantly composed of two types of feldspar (microline and plagicline, cream shades) and quartz (gray crystals), with a tiny percentage of small flecks of biotite (black mica) interspersed. HVAG is not uniform, either across its range or in outcrops 50 feet from each other. The point is not whether it contains quartz (silica) or arsenic or lead. All are present. The question is the relative quantities of each.

TABLE SHOWING ECONOMIC USES OF CERTAIN ROCKS

Formation	Alaskite gneiss	Alaskite gneiss	Joshua Rock Gneiss Member	Granite gneiss	Monson Gneiss
Letter symbol	sa	san	nj	sg	m
Crushed stone	*P	U			
Rip-rap	P		P	P	
Building stone: rough construction	P		U	U	
Paving blocks			U		
Curbing			U		
Flagstone					P

*where fine grained;
U-used or has been used
P-potential use

QUARTZ

(translucent grains)

BIOTITE

(black specks)

The remainder of the rock is comprised of feldspars (cream & orange shaded) mm scale

In his 2023 testimony, Mr. Slade claimed that somehow, magically, the quartz grains would "**probably** adhere to the feldspar and have less ***potential*** for crystalline silica. Note the absence of the word ***dust*** from his statement. It is not rational to believe that blasting, drilling, crushing, and transporting the rock across the site would not release significant quantities of silica dust into the atmosphere:

> Looking at that rock right there, you probably got about **15 to 20% of quartz** there to provide material for crystalline **silica**. When this rock is crushed, one of the things you have to also realize is **grain size plays an important part here**. **When you have coarse grained rock you probably have a better potential for liberating quartz or silica.** Here we have a super fine grained rock, so when this stuff is crushed, **the quartz grains are probably going to adhere to feldspar grains**, which are adjacent to it **and you're going to have less potential for crystalline silica**.

In his 2024 testimony, Mr. Slade doubled down, and added speculation that the large grain size of the quartz in the rock would somehow prevent or reduce the amount of silica dust spewed into the air:

> The gray rock that's there again is another granite. The other thing to take note of is, **how fine grained this material is.** Okay. Or the crystalline size of this. So again, that has some impact. **When this material is crushed down, things want to crush down to those natural grain sizes.** Okay. And that's as far down as they go.
>
> **You're going to hear testimony from a dust expert, the size of dust, operable dust, is going to be much, much, you know, size wise is much smaller.** Okay. **So this material is going to want to crush down to that the size of those grains that are there.**

Excerpts from the geological report submitted in December 2023:

As noted previously the Gales Ferry site lies within the Avalon geologic terrane of southeastern Connecticut, Rhode Island and Massachusetts. This belt of rocks is characterized by plutonic granitic, metasedimentary and metavolcanic rocks that have been strongly deformed by multiple generations of folding and contains duplicate lithotectonic units.

and 3-22, lithologically is a medium to dark gray, medium crystalline, banded gneiss. The material is composed primarily of the minerals feldspar, quartz, augite and some biotite mica, feldspar and quartz makes up approximately 70% to 75% of the rock. The minerals biotite and augite are also present in

It is inappropriate to declare that the HVAG is composed of x% of any element or mineral. It is not uniform. The Uncasville bedrock quadrangle map was published in 1967, and authored by Richard Goldsmith. In the legend of that map (no additional pamphlet was produced for that map) Goldsmith reported about ⅓ of the rock was quartz:

Alaskite gneiss

sa, *orange-pink to light-gray, fine- to medium-grained, equigranular gneissic granite composed of about equal amounts of quartz, microcline, and albite to sodic oligoclase, and about 1 percent magnetite or as much as 2 percent magnetite and biotite*

In 1985 Goldsmith published the Old Mystic bedrock map immediately to the east of the Uncasville map. He did simultaneously produce an accompanying pamphlet with additional details, including tables of measurements of the **quartz content** of the HVAG. He provided a range of values from various samples. Goldsmith conducted a modal analysis, which is not strictly the same as a percentage determination of the various components. But it is almost the same thing. It is a visual count, of at least 1,100 points from each sample, of the individual grains.

Goldsmith, Richard, 1967, Bedrock geologic map of the Uncasville quadrangle, New London County, Connecticut: U.S. Geological Survey, Geologic Quadrangle Map GQ-57
Goldsmith, Richard, 1985, Bedrock geologic map of the Old Mystic and part of the Mystic quadrangles, Connecticut, New York, and Rhode Island. & Accompanying report

The tables on the following page are from Goldsmith's 1985 report. Samples from HVAG are indicated by yellow highlighting and circling in red. He reported Approximately 30 to 44% of it is comprised of quartz.

BEDROCK GEOLOGIC MAP OF THE OLD MYSTIC AND PART OF THE MYSTIC QUADRANGLES, CONNECTICUT, NEW YORK AND RHODE ISLAND

By Richard Goldsmith

TABLE 1.—Selected modal analyses[1] of rocks from the Old Mystic quadrangle, Connecticut

	Preston Gabbro							Sterling Plutonic Group						
Rock unit	Pnp	Pqm	Spg	Spg	Spd	Spqd	Spgd	Zhv	Zhv	Zhvf	Zhv	Zhvf	Zph	Zph
Field number	(1203)	(1422)	(1139)	(1106)	(1042)	(1084)	(1051)	(1063)	(1301)	(1488)	(1418)	(1266)	(1299)	(1365)
Sample number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Quartz	26	16	—	0.2	<5	8	32	36	38	30	36	35	38	34
Plagioclase	35	39	31	40	43	59	41	35	32	42	31	33	32	32
Microcline	30	40	—	—	—	—	12	25	38	25	27	27	25	25

TABLE 2.—Selected modal analyses [1] of rocks from the Mystic quadrangle, Connecticut

Rock unit	Zmb	Zmb	Zmg	Zmb[2]	Zmhb	Zmhb	Zmhb[3]	Zma	Zhv	Zhv
Field number	(800b)	(815a)	(847)	(762)	(843d)	(837a)	(896)	(852)	(853)	(845)
Sample number	1	2	3	4	5	6	7	8	9	10
Quartz	35	29	29	35	23	32	27	5	40	44
Plagioclase	50	48	65	35	54	45	37	38	32	29
Microcline	1	8	2	23	8	12	30	—	25	26
Biotite	13	10	3	6	8	7	5	—	2	0.8
Hornblende	—	3	—	—	5	2	—	53	—	—

1 **Each mode is based on one thin section. Over 1,100 points counted per thin section.**

J. Slade, **December 14, 2023:**

Taking a look at the image of the core samples, you can see the two rock types.

You can see the two rock types you got the alaskite gneiss is the **pink colored rock** on the left and the one on the right is more of a granitic gneiss. You can see on the image, again, on the right hand side, you can see some of the cores.

The pinkish granite on the left shows the abundance of the mineral feldspar. That's the pinkish color that you have. **You also have quartz there.** And you have maybe three to five percent of dark mafic minerals. The dark color is probably a mineral called either hornblende or biotite mica. There are pretty common minerals when you're looking at granites. It's important to take note, **the relatively low percentage of quartz** that's here. And this is important to look at - you know - this rock is going to be processed and crushed. I'm sure that somebody's going to bring up the concern over crystalline silica. And **quartz is silica**.

DEEP Blasting Guidance

. . . quarries where significant earth removal and/or **blasting** activities are likely to occur. Because of those types of activities, there is concern for possible negative impacts to the **quality** and **quantity** of water in neighboring drinking water wells . . .

… there is an **elevated risk for mobilizing** . . . which may adversely affect groundwater and drinking water quality. In addition, **increased mobilization of arsenic**, **uranium and/or radon** can occur in areas where these naturally-occurring minerals are present in the bedrock formation.

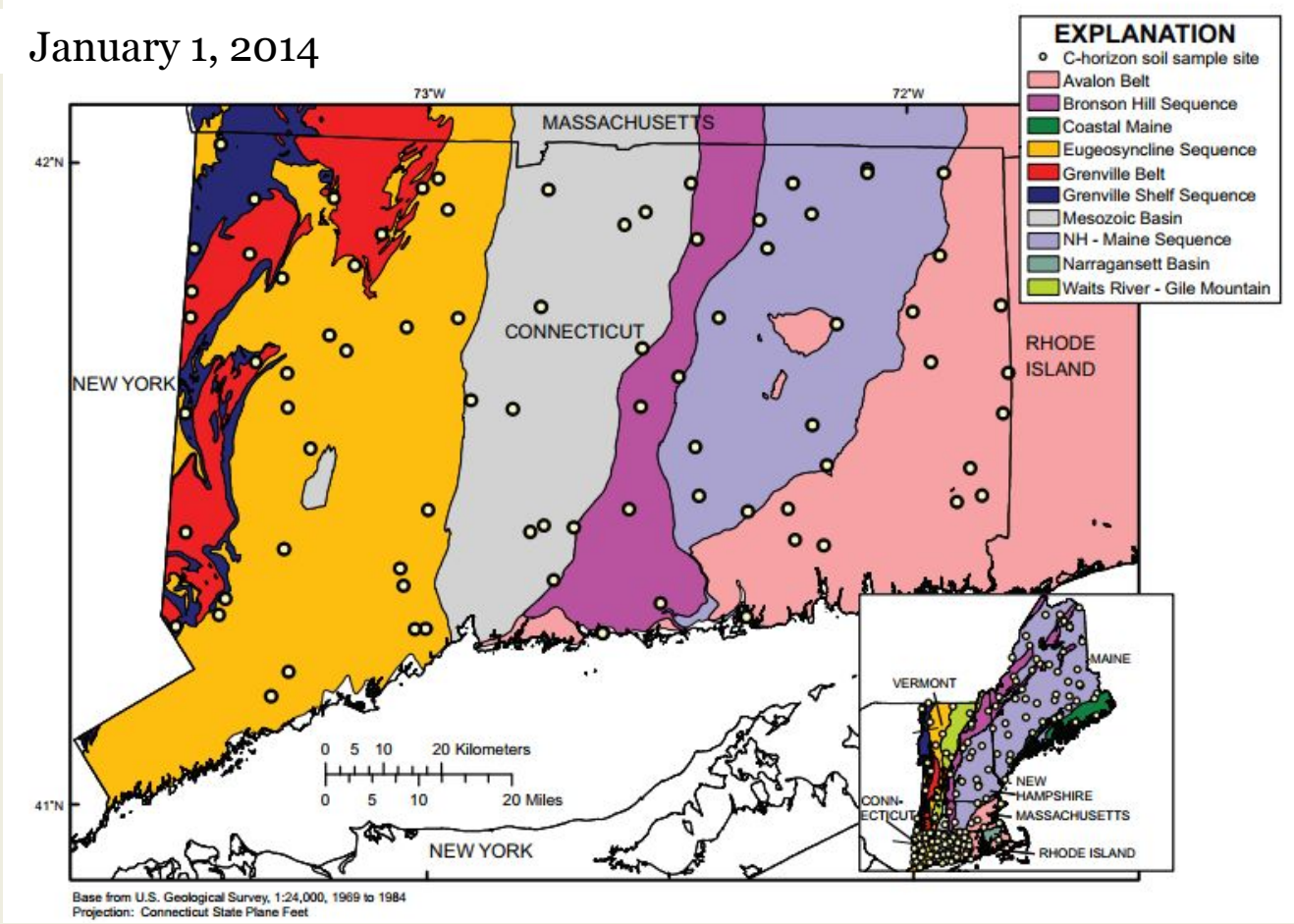
Elevated arsenic and uranium levels have been documented by the USGS in the rock present on the GFI property:

In CT, **U concentration** means were significantly higher in C-horizon **soils** overlying **Avalonian granites**, and U concentrations ranged **as high as 14 mg/kg**, compared to those in C-horizon soil samples collected from other New England states, which ranged as high as 6.1 mg/kg in a sample in NH overlying the NH-ME Sequence

The Avalonian terrane bedrock is mapped on the following page, in pink.

Major and trace element geochemistry and background concentrations for soils in Connecticut

January 1, 2014



Source:

https://pubs.usgs.gov/of/2017/1046/ofr20171046.pdf

USGS
science for a changing world

Prepared in cooperation with the Connecticut Department of Public Health

Arsenic and Uranium in Private Wells in Connecticut, 2013–15

Table 3. Arsenic and uranium concentrations that exceed maximum contaminant levels from 674 private wells in Connecticut, by geologic unit and major bedrock category, 2013–15.

[Geologic unit names are the Connecticut Department of Energy and Environmental Protection preferred names as modified from Rodgers (1985). Bedrock categories (subheadings) are modified from Robinson and Kapo (2003). Color shadings indicate the percentage of wells with exceedances above concentration thresholds in ranges of , no data (—); , less than (<) 1 percent; , 1 to 10 percent; , more than (>) 10 to 20 percent; , >20 to 30 percent; and , >30 percent. MCL, U.S. Environmental Protection Agency maximum contaminant level enforceable for public water supplies; µg/L, microgram per liter; NA, not available]

Geologic unit name	Geologic unit code	Number of samples		MCL, percentage[1] of water samples with concentrations, in micrograms per liter		Percentage of study area underlain by geologic unit[2]
		Arsenic	Uranium	Arsenic >10 µg/L	Uranium >30 µg/L	
Avalon granite						
"Scituate" Granite Gneiss	Zss	1	1	0	0	0.7
Hope Valley Alaskite Gneiss	Zsh	5	3	20.0	0	2.1
Plainfield Formation	Zp	3	2	0	0	1.4
porphyritic phase of Potter Hill Granite Gneiss	Zspp	1	1	0	0	<0.2

USGS
science for a changing world

Prepared in cooperation with the Connecticut Department of Public Health

Arsenic and Uranium in Private Wells in Connecticut, 2013–15

Major Findings

- Nearly 1 out of 15 (7 percent) water samples from 674 private wells tested in Connecticut contained either arsenic or uranium at concentrations that exceed the U.S. Environmental Protection Agency's (EPA) maximum contaminant levels (MCLs) enforceable for drinking-water supplies of 10 micrograms per liter (µg/L) for arsenic or 30 µg/L for uranium.
- Of the 81 geologic units studied, 19 had at least one sample with arsenic or uranium concentrations that exceeded the MCL.

Introduction

The occurrence of arsenic and uranium in groundwater at concentrations that exceed drinking-water standards is a concern because of the potential adverse effects on human health. Some early studies of arsenic occurrence in groundwater considered anthropogenic causes, but more recent studies have focused on sources of naturally occurring arsenic to groundwater, such as minerals within aquifer materials that are in contact with groundwater. Arsenic and uranium in groundwater in New England have been shown to have a strong association to the geologic setting (Ayotte and others, 2003, 2006) and nearby streambed sediment concentrations (Robinson and Ayotte, 2006). In New Hampshire and Massachusetts, arsenic and uranium concentrations greater than human-health benchmarks have shown distinct spatial patterns when related to the bedrock units mapped at the local scale (Montgomery and others, 2003; Colman, 2011; Flanagan and others, 2014).

The Connecticut Department of Public Health (DPH; 2016) reported that there are about 322,600 private wells in Connecticut serving approximately 823,000 people, or 23 percent of the State's population. The State does not require that existing private wells be routinely tested for arsenic, uranium, or other contaminants; consequently, private wells are only sampled at the well owner's discretion or when they are newly constructed. The U.S. Geological Survey (USGS), in cooperation with the DPH, completed an assessment in 2016 on the distribution of concentrations of arsenic and uranium in groundwater from bedrock in Connecticut (fig. 1). This report presents the major findings for arsenic and uranium concentrations from water samples collected from 2013 to 2015 from private wells.

Sources of Data on Arsenic and Uranium Concentrations

The main objective of this study was to compile and analyze arsenic and uranium concentrations from private wells throughout Connecticut (fig. 1). In cooperation with the DPH, local health departments and districts used volunteers to visit randomly selected houses in their districts and collect an unfiltered water sample from an untreated source in the home. Staff from DPH also distributed bottles to homeowners at four agricultural fairs in Bethlehem, Durham, Goshen, and Woodstock; at water fair events in East Hampton and Colchester; and one home show in Hartford. These homeowners were instructed to collect an unfiltered water sample prior to any existing treatment system. The water samples, collected from 2013 to 2015, were submitted to the DPH Laboratory in Hartford for trace-element analysis according to EPA method 200.8 (U.S. Environmental Protection Agency, 1994).

The towns of Stamford, Weston, and Wilton have substantially more water samples and wells than the other studied towns. On average, 7 wells were sampled in most towns, whereas, 81 wells were sampled in Wilton; 110 wells, in Weston; and 732 wells, in Stamford, resulting in an unbalanced distribution of water samples in the State. To balance the distribution for the purposes of this study, 7 to 14 wells from Stamford, Weston, and Wilton were randomly selected for inclusion in the statewide dataset. This subset of samples represented less than 5 percent of the final statewide dataset, which consisted of 660 arsenic samples and 589 uranium samples collected from 674 wells. Data for these 674 wells are available in Flanagan and Brown (2017). All available data from these three towns are discussed in the "Comparison of Arsenic and Uranium Exceedance Rates in Three Towns" section.

As part of the quality assurance plan for this study, the USGS submitted six standard reference samples to the DPH Laboratory with concentrations of arsenic and uranium spanning the range of expected environmental values. These samples were supplied by the USGS Branch of Quality Systems (U.S. Geological Survey, 2016) in Denver, Colo., and provided an independent analysis of measurable bias. Results from the analysis of the standard reference samples (table 1) indicated no measurable bias.

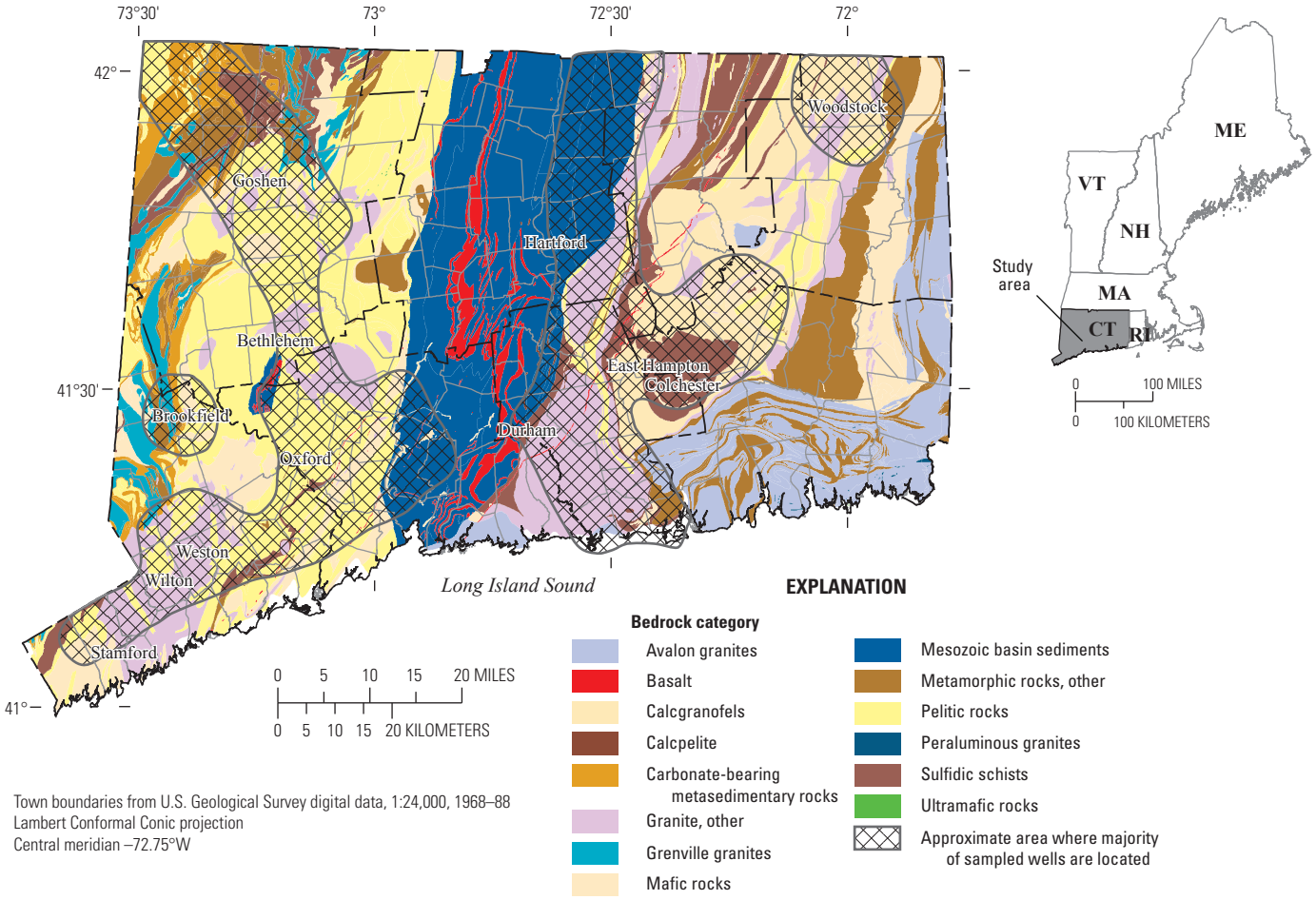


Figure 1. Locations of major categories of bedrock in Connecticut and areas where the majority of sampled wells are located. Modified bedrock categories are described in Robinson and Kapo (2003).

Table 1. Inventory of standard reference samples for arsenic and uranium concentrations, in 2015.

[SRS, standard reference sample; #, number; µg/L, microgram per liter; MPV, most probable value; DPH, Connecticut Department of Public Health Laboratory in Hartford, Conn.; <, less than; na, not applicable]

SRS lot#	Submission Date	Arsenic concentration, in µg/L			Uranium concentration, in µg/L		
		MPV	DPH	RPD[1]	MPV	DPH	RPD[1]
T–219	6/30/2015	3.51	<3.00	na	1.58	1.50	5.2
T–201	7/28/2015	24.4	23.0	5.9	9.22	9.20	0.2
T–201b	8/18/2015	24.4	23.0	5.9	9.22	9.10	1.3
T–217A	8/31/2015	5.99	5.80	3.2	1.78	1.70	4.6
T–217B	9/29/2015	5.99	5.20	14.1	1.78	1.70	4.6
T–201c	9/29/2015	24.4	22.0	10.3	9.22	9.30	0.8

[1]Relative percent difference = [|(Sample 1 – Sample 2)| / Average (Sample 1 + Sample 2)] × 100, where sample 1 is the MPV value and sample 2 is the DPH value.

Arsenic and Uranium Concentrations in the State

Arsenic concentrations ranged mostly (95th percentile) from less than (<) 3 to 7.1 micrograms per liter (µg/L). Uranium concentrations ranged mostly (95th percentile) from <1 to 23 µg/L (table 2). Arsenic at concentrations at or above the minimum reporting level (MRL) of 3 µg/L was measured in 9.1 percent of samples. Uranium at concentrations at or above the MRL of 1 µg/L was measured in 42.1 percent of the samples. Statewide, 3.6 percent of samples had arsenic concentrations that exceeded the MCL of 10 µg/L, and 3.9 percent had uranium concentrations that exceeded the MCL of 30 µg/L (table 2). Overall, about 7 percent of the samples had concentrations of arsenic or uranium that exceeded an MCL.

Arsenic and Uranium Occurrence in Relation to Bedrock Geology

There are distinct areas in Connecticut where one or more groundwater samples have arsenic and uranium concentrations greater than their respective MCLs (fig. 2). Data were grouped in relation to mapped bedrock units (referred to as geologic units in this report) identified on the bedrock geological map of Connecticut (Rodgers, 1985). It was assumed that each well was drilled and completed in the geologic unit represented at the

Table 2. Arsenic and uranium concentrations in water samples from 674 private wells in Connecticut, 2013–15.

[No., number; MRL, minimum reporting level; µg/L, microgram per liter; MCL, U.S. Environmental Protection Agency maximum contaminant level for public water supplies; Min, minimum; Max, maximum; <, less than]

Trace element	No. of samples	MRL, in µg/L	Percentage of samples with concentrations equal to or exceeding MRL	Concentration, in µg/L						MCL, in µg/L	Percentage of samples with concentrations exceeding MCL
				Min.	Percentile				Max.		
					50	75	90	95			
Arsenic	660	3	9.1	<3	<3	<3	<3	7.1	470	10	3.6
Uranium	589	1	42.1	<1	<1	3.2	9.3	23	766	30	3.9

well's location on the geologic map. Geologic units are rocks of a specific geologic age that have unique mineral and physical characteristics, varying degrees of resistance to weathering, and similar processes of rock formation. Arsenic and uranium samples were grouped according to the geologic units in which the sampled wells are located (table 3).

Of the 156 geologic units in the State, 81 units (covering 82.6 percent of the land area), were represented by at least one water sample analyzed for arsenic and (or) uranium (table 3). Twenty-one geologic units had only 1 sample, 43 geologic units had 2 to 10 samples, and 17 geologic units had more than 10 samples. The 81 geologic units were organized under 10 different bedrock categories and are listed in table 3. These bedrock categories (fig. 1) are based on groups of individual geologic units with similar geochemical and lithological properties (Robinson and Kapo, 2003). The percentage of samples in each geologic unit with arsenic and uranium concentrations that exceeded MCLs was computed and then geologic units were grouped and colored based on percentage ranges (fig. 2). The exceedance percentages for geologic units computed for this study may not represent the actual hazard for existing and future wells in these units. Nonetheless, this report provides new information on arsenic and uranium contamination at the State scale.

Results of this analysis indicate that the geologic units were markedly different in terms of arsenic and uranium concentrations that exceeded MCLs (table 3). Nine of 81 geologic units had at least one sample with arsenic concentrations that exceeded the MCL of 10 µg/L. Fourteen geologic units had at least one sample with uranium concentrations that exceeded the MCL of 30 µg/L. None of the geologic units in the carbonate-bearing metasedimentary rocks, Grenville granites, mafic rocks, or metamorphic rocks, other bedrock categories had arsenic concentrations that exceeded the MCL (table 3). None of the geologic units in the Avalon granites, carbonate-bearing metasedimentary rocks, Grenville granites, Mesozoic basin sediments, or sulfidic schists bedrock categories had uranium concentrations that exceeded the MCL. The pelitic rocks bedrock category had three geologic units with at least one arsenic concentration that exceeded the MCL, and the granite, other bedrock category had seven geologic units with at least one uranium concentration that exceeded the MCL—the most among the 10 bedrock categories.

In the greater than (>) 20 to 30 percent group (table 3), the Taine Mountain and Collinsville Formation undivided (4 samples) and the Glastonbury Gneiss (20 samples) were the only geologic units with arsenic and (or) uranium concentrations that exceeded MCLs. In the >30 percent group, the Carringtons Pond Member of the Trap Falls Formation (3 samples) was the only geologic unit with concentrations that exceeded the MCL for arsenic, and the Dalton Formation and the Harrison Gneiss (3 samples each) were the only geologic units with concentrations that exceeded the MCL for uranium (table 3).

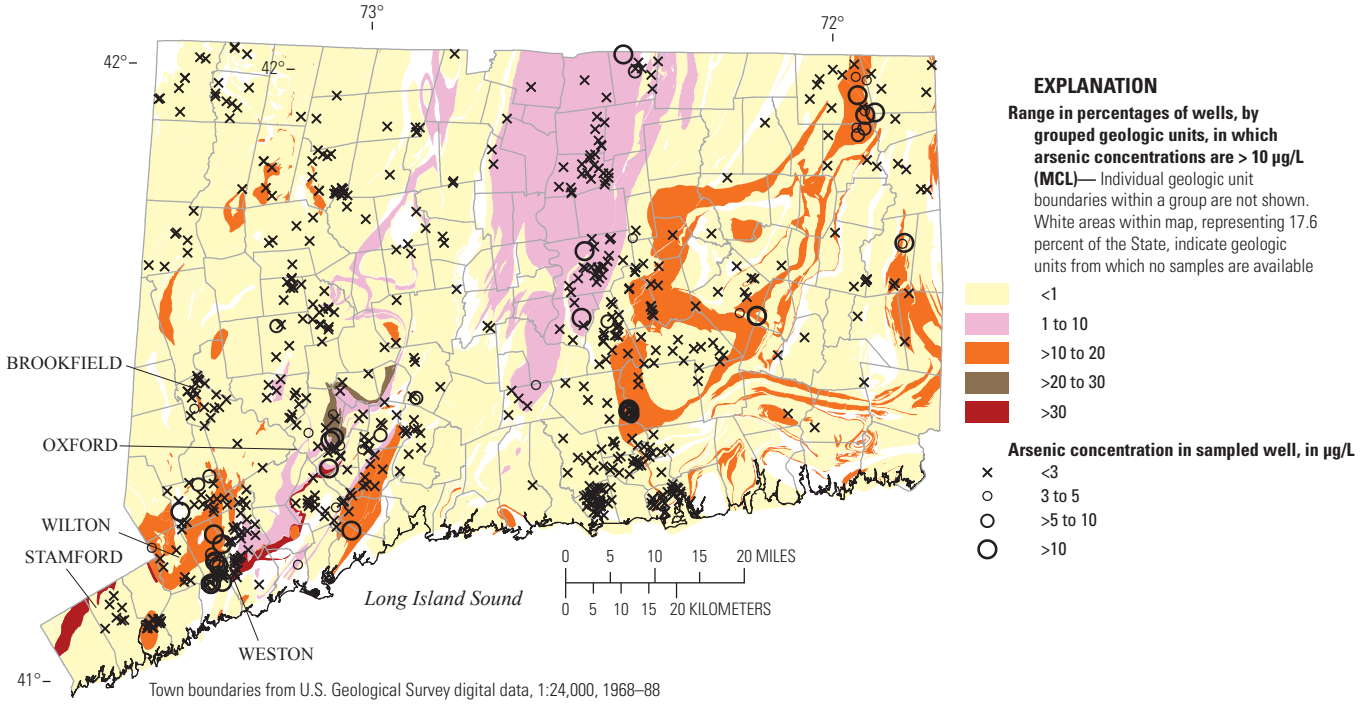
The well with the highest arsenic concentration (470 µg/L), from the town of Oxford, is completed in The Straits Schist geologic unit of the Pelitic rocks bedrock category. Although 8.3 percent of the 12 samples in this geologic unit also have high arsenic (>10 µg/L), six other geologic units (table 3) in the State have higher percentages of samples with high arsenic. This finding shows that wells with elevated arsenic are not always in the most high-risk areas.

The well with the highest uranium concentration (766 µg/L), from the town of Brookfield, is completed in the Dalton Formation geologic unit of the Metamorphic rock, other bedrock category. In a neurotoxicity case study in Brookfield, it was determined that a family was unknowingly exposed to well water containing 866 to 1,166 µg/L of uranium (Magdo and others, 2007). The private well in the case study was located in the Brookfield Gneiss geologic unit, a mafic rock common throughout the Appalachian ridges of western Connecticut. Magdo and others (2007) sampled 10 other wells in close proximity to the case-study well and discovered widely variable uranium concentrations ranging from 0.21 to 521 µg/L. Altogether, 4 of the 11 wells in Magdo and others (2007) exceeded the MCL for uranium. However, none of the 12 water samples from the Brookfield Gneiss geologic unit of the Mafic rocks bedrock category in this study exceeded the MCL for uranium (table 3). This finding shows that uranium concentrations can be highly variable, even in wells in close proximity to each other or in similar geologic settings. These two examples for wells with elevated arsenic and uranium concentrations highlight the importance of individual well testing for naturally occurring contaminants.

Comparison of Arsenic and Uranium Exceedance Rates in Three Towns

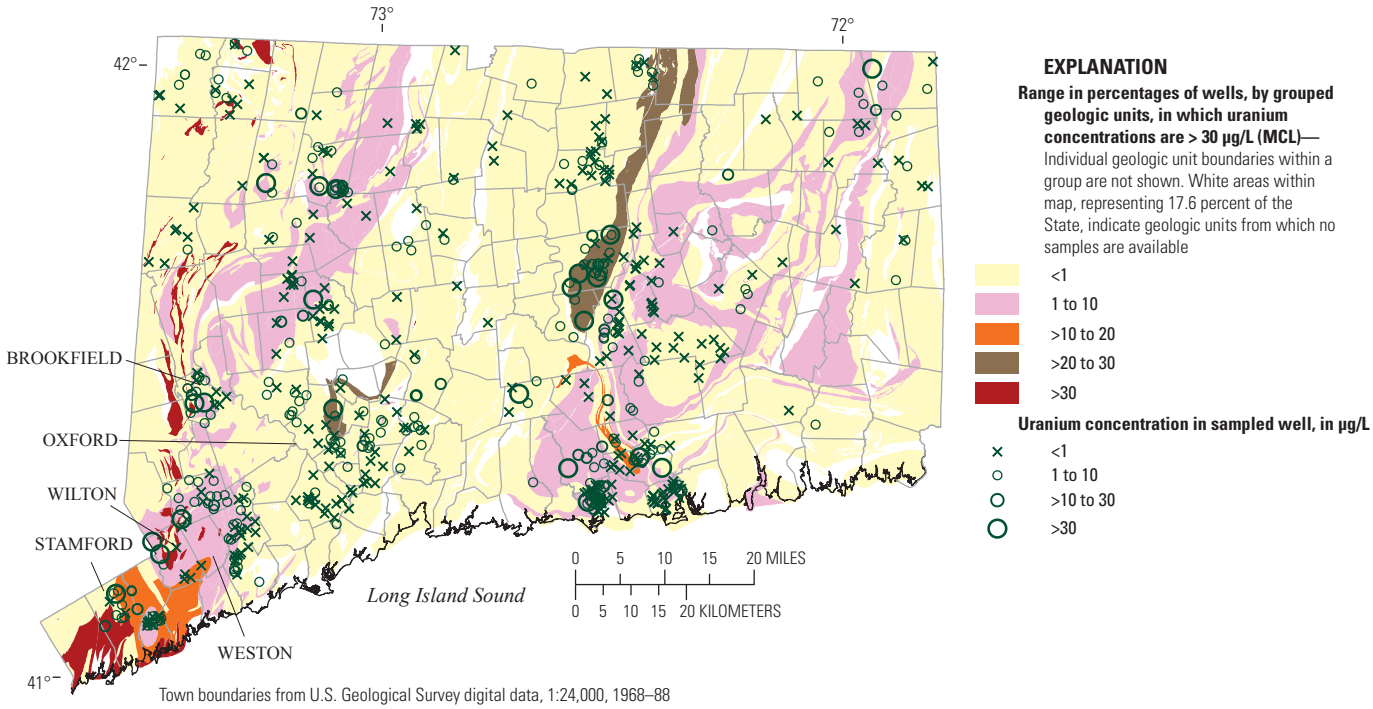
A select group of geologic units have concentrations of arsenic and (or) uranium that exceed MCLs (fig. 2; table 3). Therefore, a town's vulnerability to arsenic and uranium contamination may depend greatly on the extent

A. **Percentage of wells, by grouped geologic units with arsenic concentrations > 10 µg/L (MCL)**



Town boundaries from U.S. Geological Survey digital data, 1:24,000, 1968–88
Geologic units from Connecticut Geological and Natural History Survey digital data, 1:125,000, 1985

B. **Percentage of wells, by grouped geologic units with uranium concentrations > 30 µg/L (MCL)**



Town boundaries from U.S. Geological Survey digital data, 1:24,000, 1968–88
Geologic units from Connecticut Geological and Natural History Survey digital data, 1:125,000, 1985

Figure 2. Range of percentages of private wells in Connecticut, by grouped geologic units, in which *A*, arsenic concentrations exceeded the maximum concentration level (MCL) of 10 micrograms per liter (µg/L) and *B*, uranium concentrations exceeded the MCL of 30 µg/L. Concentrations of arsenic and uranium in water samples collected from 674 individual wells and the spatial distribution of the wells are also shown. Well locations have been offset by one-fourth mile to maintain the confidentiality of the well owner's identity. Geologic units are listed in table 3. See Rodgers (1985) for the location and description of individual geologic units. <, less than; > greater than.

Table 3. Arsenic and uranium concentrations that exceed maximum contaminant levels from 674 private wells in Connecticut, by geologic unit and major bedrock category, 2013–15.

[Geologic unit names are the Connecticut Department of Energy and Environmental Protection preferred names as modified from Rodgers (1985). Bedrock categories (subheadings) are modified from Robinson and Kapo (2003). Color shadings indicate the percentage of wells with exceedances above concentration thresholds in ranges of , no data (—); , less than (<) 1 percent; , 1 to 10 percent; , more than (>) 10 to 20 percent; , >20 to 30 percent; and , >30 percent. MCL, U.S. Environmental Protection Agency maximum contaminant level enforceable for public water supplies; µg/L, microgram per liter; NA, not available]

Geologic unit name	Geologic unit code	Number of samples		MCL, percentage[1] of water samples with concentrations, in micrograms per liter		Percentage of study area underlain by geologic unit[2]
		Arsenic	Uranium	Arsenic >10 µg/L	Uranium >30 µg/L	
Avalon granite						
"Scituate" Granite Gneiss	Zss	1	1	0	0	0.7
Hope Valley Alaskite Gneiss	Zsh	5	3	20.0	0	2.1
Plainfield Formation	Zp	3	2	0	0	1.4
porphyritic phase of Potter Hill Granite Gneiss	Zspp	1	1	0	0	<0.2
Potter Hill Granite Gneiss	Zsph	2	2	0	0	1.3
Potter Hill Granite Gneiss and Narragansett Pier Granite undivided	Zsph + Pn	1	1	0	0	<0.2
Rope Ferry Gneiss of the "Waterford Group"	Zwr	5	5	0	0	1.1
Calcgranofels						
Fly Pond (calc-silicate) member of Tatnic Hill Formation	Otaf	1	—	0	—	0.4
Hebron Gneiss	SOh	45	24	17.8	4.2	4.7
lower member of Bigelow Brook Formation	SObl	2	2	0	0	0.6
Southbridge Formation	SOs	5	2	0	0	1.0
Carbonate-bearing metasedimentary rocks						
basal marble member of Walloomsac Schist	Owm	4	4	0	0	0.5
Stockbridge Marble	OCs	3	2	0	0	0.8
unit b of Stockbridge Marble	Csb	6	6	0	0	0.4
unit c of Stockbridge Marble	Csc	3	3	0	0	0.5
units e and d of Stockbridge Marble	Ose	1	1	0	0	<0.2
Granite, other						
"Eastford gneiss phase" of Canterbury Gneiss	Dce	2	1	0	0	0.5
Canterbury Gneiss	Dc	2	1	0	0	1.2
Glastonbury Gneiss	Ogl	22	20	4.5	25.0	1.7
lower member of Middletown Formation	Oml	3	3	0	0	<0.2
Middletown Formation	Om	10	11	0	0	1.0
Monson Gneiss	Omo	47	45	0	4.4	2.4
Nonewaug Granite	Dng	10	10	0	10.0	0.6
Ordovician granitic gneiss	Og	56	41	14.3	9.8	2.1
Trap Falls Formation and Ordovician granitic gneiss undivided	Otf + Og	3	9	0	11.1	1.0
upper member of Middletown Formation	Omu	9	9	0	11.1	0.2
Waterbury Gneiss	Cwb	1	—	0	—	0.8
Waterford Group	Zw	26	25	0	4.0	0.8
Grenville granite						
Gneiss of Highlands massifs	Yg	4	4	0	0	0.6
pink granitic gneiss	Ygr	2	2	0	0	1.1
Mafic rocks						
amphibolite-bearing unit of Manhattan Schist	Cma	3	3	0	0	0.4
Beardsley Member of Harrison Gneiss	Ohb	9	8	0	0	0.5
Brookfield Gneiss	Ob	14	12	0	0	1.2
dioritic phase of Lebanon Gabbro	Dld	1	1	0	0	<0.2
gneiss (metavolcanic) member of Brimfield Schist	Obrg	5	5	0	0	0.3
Harrison Gneiss	Oh	3	3	0	33.3	0.9

Table 3. Arsenic and uranium concentrations that exceed maximum contaminant levels from 674 private wells in Connecticut, by geologic unit and major bedrock category, 2013–15.—Continued.

[Geologic unit names are the Connecticut Department of Energy and Environmental Protection preferred names as modified from Rodgers (1985). Bedrock categories (subheadings) are modified from Robinson and Kapo (2003). Color shadings indicate the percentage of wells with exceedances above concentration thresholds in ranges of , no data (—); , less than (<) 1 percent; , 1 to 10 percent; , more than (>) 10 to 20 percent; , >20 to 30 percent; and , >30 percent. MCL, U.S. Environmental Protection Agency maximum contaminant level enforceable for public water supplies; µg/L, microgram per liter; NA, not available]

Geologic unit name	Geologic unit code	Number of samples		MCL, percentage[1] of water samples with concentrations, in micrograms per liter		Percentage of study area underlain by geologic unit[2]
		Arsenic	Uranium	Arsenic >10 µg/L	Uranium >30 µg/L	
Mafic rocks—Continued						
hornblende gneiss member of Collinsville Formation	Ocg	3	3	0	0	0.4
Lebanon Gabbro	Dl	2	2	0	0	0.3
massive mafic rock in Middletown Formation	Omm	1	1	0	0	<0.2
Pumpkin Ground Member of Harrison Gneiss	Ohp	4	4	0	0	0.4
Quinebaug Formation	Oq	11	5	0	0	1.8
Mesozoic basin sediments						
East Berlin Formation	Jeb	5	4	0	0	1.2
Hampden Basalt	Jha	1	1	0	0	0.3
New Haven Arkose	TRnh	20	20	0	0	5.7
Portland Arkose	Jp	43	41	4.7	0	7.3
Shuttle Meadow Formation	Jsm	1	1	0	0	0.4
Metamorphic rocks, other						
Bristol Gneiss	Obs	2	2	0	0	0.4
Clough Quartzite	Sbc	1	1	0	0	<0.2
Dalton Formation	Cd	3	3	0	33.3	0.7
Fitch Formation	Sbf	1	1	0	0	<0.2
hornblende gneiss and amphibolite	Ygh	1	1	0	0	0.7
Llayered gneiss	Ygn	3	3	0	0	1.7
quartzite unit in Plainfield Formation	Zpq	1	1	0	0	0.6
Tatnic Hill Formation	Ota	22	20	0	5.0	2.8
Pelitic rocks						
amphibolite unit in Ratlum Mountain Schist	Ora	1	1	0	0	<0.2
basal member of Taine Mountain Formation around Waterbury dome	Otb	2	2	0	0	0.4
Collins Hill Formation	Och	4	4	0	0	0.8
Collinsville Formation	Oc	20	20	0	0	1.0
Golden Hill Schist	Ogh	3	3	0	0	0.3
Hoosac Schist	Ch	10	10	0	10.0	1.0
Littleton Formation	Dbl	2	2	0	0	0.4
Manhattan Schist	Cm	5	5	0	0	1.8
Maromas Granite Gneiss	Dm	1	1	0	0	<0.2
Oronoque Schist	Oo	1	1	0	0	0.4
Ratlum Mountain Schist	Or	47	40	0	2.5	4.0
Rowe Schist	OCr	14	14	0	0	1.7
schist and granulite member of Trap Falls Formation	Otfg	17	14	0	0	0.5
Scotland Schist	DSs	3	3	0	0	0.9
Shelton (white gneiss) Member of Trap Falls Formation	Otfs	3	3	0	0	0.3
Southington Mountain Member of The Straits Schist	DSts	1	1	0	0	0.3
Taine Mountain Formation	Ot	9	9	0	0	0.8
Taine Mountain Formation and Collinsville Formation undivided	Ot + Oc	4	4	25.0	25.0	0.3
The Straits Schist	DSt	12	12	8.3	0	1.9
Walloomsac Schist	Ow	6	6	0	0	0.5
Wepawaug Schist	DSw	9	8	11.1	0	0.7
Whigville Member of Taine Mountain Formation	Otwv	1	1	0	0	<0.2

Table 3. Arsenic and uranium concentrations that exceed maximum contaminant levels from 674 private wells in Connecticut, by geologic unit and major bedrock category, 2013–15.—Continued.

[Geologic unit names are the Connecticut Department of Energy and Environmental Protection preferred names as modified from Rodgers (1985). Bedrock categories (subheadings) are modified from Robinson and Kapo (2003). Color shadings indicate the percentage of wells with exceedances above concentration thresholds in ranges of , no data (—); , less than (<) 1 percent; , 1 to 10 percent; , more than (>) 10 to 20 percent; , >20 to 30 percent; and , >30 percent. MCL, U.S. Environmental Protection Agency maximum contaminant level enforceable for public water supplies; µg/L, microgram per liter; NA, not available]

Geologic unit name	Geologic unit code	Number of samples		MCL, percentage[1] of water samples with concentrations, in micrograms per liter		Percentage of study area underlain by geologic unit[2]
		Arsenic	Uranium	Arsenic >10 µg/L	Uranium >30 µg/L	
Sulfidic schists						
Brimfield Schist	Obr	33	32	0	0	3.2
Carringtons Pond Member of Trap Falls Formation	Otfc	3	3	33.3	0	0.5
rusty mica schist and gneiss	Ygs	2	2	0	0	0.9
upper slice of Canaan Mountain Schist	Cmcu	1	1	0	0	0.3
unmapped areas	NA	1	1	0	0	1.0
Overall for the study area	**NA**	**660**	**589**	**3.6**	**3.9**	**82.4**

[1]The percentage (of exceedance) values for geologic units computed for this study may not represent the actual risk for existing and future wells in these units.

[2]About 17.6 percent of the study area (State of Connecticut) was underlain by 75 individual geologic units from which no water samples were collected.

to which these geologic units are within its borders. This is demonstrated by examining all available water-quality data for three towns with the largest number of sampled wells (table 4). In Stamford, which is in southwestern Connecticut (fig. 2), 0.1 percent of 732 samples had high arsenic concentrations (>10 µg/L) and 11.2 percent of 731 samples had high uranium concentrations (>30 µg/L; table 4). This difference in occurrence rates between the two elements is likely explained by the geologic setting of the town. Much of Stamford is underlain by the Harrison Gneiss geologic unit of the Mafic rocks bedrock category and the Trap Falls Formation and Ordovician granitic gneiss undivided geologic unit of the Granite, other bedrock category. For these two units, none of the samples in the statewide dataset had high arsenic concentrations, yet 33.3 and 11.1 percent, respectively, of samples had high uranium concentrations (table 3).

The towns of Weston and Wilton are adjacent to each other in southwestern Connecticut (figs. 1 and 2). However, more than 47 percent of samples in Weston had high arsenic concentrations, but only 2.5 percent of samples in Wilton had high arsenic concentrations (table 4). In Weston, the dominant geologic unit is the Ordovician granitic gneiss of the Granite, other bedrock category, and 14.3 percent of 56 samples from this unit in the statewide dataset had high arsenic concentrations (table 3). In Wilton, the dominant geologic units are the Harrison Gneiss and the Pumpkin Ground Member of Harrison Gneiss (Mafic rocks bedrock category), and the Trap Falls Formation and Ordovician granitic gneiss undivided of the Granite, other bedrock category; none of the wells from these units in the statewide dataset had high arsenic concentrations (table 3).

Table 4. Arsenic and uranium concentrations that exceed maximum contaminant levels from private wells in Connecticut, for three towns, 2013–15.

[MCL, U.S. Environmental Protection Agency maximum contaminant levels enforceable for public water supplies; µg/L, microgram per liter; > greater than; —, no data]

Town	Number of samples		Percentage of samples with concentrations that exceed MCL	
	Arsenic	Uranium	Arsenic >10 µg/L	Uranium >30 µg/L
Stamford	732	731	0.1	11.2
Weston	110	—	47.3	—
Wilton	81	80	2.5	7.5
Statewide dataset	660	589	3.6	3.9

Human Health Implications

High concentrations of arsenic and uranium in drinking water have been associated with increased risk of lung, bladder, and skin cancers for arsenic and adverse effects on kidney function for uranium (Magdo and others, 2007). For households in Connecticut that rely on private wells for drinking water, this study has shown that the likelihood of having arsenic or uranium concentrations that exceed human-health benchmarks may depend in large part on the particular geologic unit in which the household's well is located. Other factors can affect arsenic or uranium concentrations, such as geochemical conditions or residence time for water-rock reactions in the local groundwater system. For more information about well testing and treatment guidelines in Connecticut (Connecticut Department of Public Health, 2013), contact the Connecticut Department of Public Health Private Well Program by calling (860) 509–7296 or visit their website at http://www.ct.gov/dph/privatewells.

Acknowledgments

This study was prepared in cooperation with the DPH as part of their cooperative agreement with the National Center for Environment Health of the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services to provide support for public health drinking water programs to reduce drinking water exposures. The authors thank Laura Apinis and Jack Bennett at the DPH Laboratory for sample analysis; Brian Toal, Gary Archambault, Sharee Rusnak, Kenny Foscue, Ryan Tetreault, and Tiziana Shea at the DPH for the trace-element and site location data used in this study; and Connecticut State Geologist Margaret Thomas for her input.

References Cited

Ayotte, J.D., Montgomery, D.L., Flanagan, S.M., and Robinson, K.W., 2003, Arsenic in groundwater in eastern New England: occurrence, controls, and human health implications: Environmental Science and Technology, v. 37, no. 10, p. 2075-2083. [Also available at https://nh.water.usgs.gov/Publications/2003/es026211g.pdf.]

Ayotte, J.D., Nolan, B.T., Nuckols, J.R., Cantor, K.P., Robinson, G.R., Jr., Baris, Dalsu, Hayes, Laura, Karagas, Margaret, Bress, William, Silverman, D.T., and Lubin, J.H., 2006, Modeling the probability of arsenic in groundwater in New England as a tool for exposure assessment: Environmental Science and Technology, v. 40, p. 3578–3585.

Colman, J.A., 2011, Arsenic and uranium in water from private wells completed in bedrock of east-central Massachusetts—Concentrations, correlations with bedrock units, and estimated probability maps: U.S. Geological Survey Scientific Investigations Report 2011–5013, 113 p.

Connecticut Department of Public Health, 2013, Private well testing: Connecticut Department of Public Health Publication no. 24, 6 p. [Also available at http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/24_residential_drinking_water_well_testing.pdf.]

Connecticut Department of Public Health, 2016, Private wells: Connecticut Department of Public Health Web page, accessed March 29, 2016, at http://www.ct.gov/dph/cwp/view.asp?a=3140&q=400544.

Flanagan, S.M, Belaval, Marcel, and Ayotte, J.D., 2014, Arsenic, iron, lead, manganese, and uranium concentrations in private bedrock wells in southeastern New Hampshire, 2012–2013: U.S. Geological Survey Fact Sheet 2014–3042, 6 p., appendixes. [Also available at https://doi.org/10.3133/fs20143042.]

Flanagan, S.M., and Brown, C.J., 2017, Inventory of water-quality and geologic-setting data from 674 private wells in Connecticut, 2013-2015: U.S. Geological Survey data release, https://doi.org/10.5066/F7K935P5.

Magdo, S.H., Forman, Joel, Graber, Nathan, Newman, Brooke, Klein, Kathryn, Satlin, Lisa, Amler, R.W., Winston, J.A., and Landrigan, P.J., 2007, Grand rounds—Nephrotoxicity in a young child exposed to uranium from contaminated well water: Environmental Health Perspectives, v. 115, no. 8, p. 1237–1241.

Montgomery, D.L., Ayotte, J.D., Carroll, P.R., and Hamlin, Patricia, 2003, Arsenic concentrations in private bedrock wells in southeastern New Hampshire: U.S. Geological Survey Fact Sheet 03–051, 6 p. [Also available at https://pubs.er.usgs.gov/publication/fs05103.]

Robinson, G.R., Jr., and Ayotte, J.D., 2006, The influence of geology and land use on arsenic in stream sediments and ground waters in New England, USA: Applied Geochemistry, v. 21, p. 1482–1497.

Robinson, G.R., Jr., and Kapo, K.E., 2003, Generalized lithology and lithogeochemical character of near-surface bedrock in the New England region: U.S. Geological Survey Open-File Report 03–225, 60 p. [Also available at https://pubs.er.usgs.gov/publication/ofr03225.]

Rodgers, John, comp., 1985, Bedrock geological map of Connecticut: Connecticut Geological and Natural History Survey, Natural Resource Atlas Map Series, scale 1:125,000, 2 sheets, accessed December 12, 2016, at https://ngmdb.usgs.gov/Prodesc/proddesc_54245.htm.

U.S. Environmental Protection Agency, 1994, Methods for the determination of metals in environmental samples, supplement I (rev. 5.4): U.S. Environmental Protection Agency EPA/600/R–94/111, 260 p.

U.S. Geological Survey, 2016, The Branch of Quality Systems: accessed November 2016, at https://bqs.usgs.gov.

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ISSN 2331-1258 (online)
https://doi.org/10.3133/ofr20171046

Village of Euclid v. Ambler Realty Co.

U.S. Supreme Court — 1926

(Basis for all zoning statutes)

There is no serious difference of opinion in respect of the validity of laws and regulations . . . **excluding from residential sections** offensive trades, industries and structures likely to create **nuisances**.

The power to relegate industrial establishments to localities separate from residential sections is not to be denied upon the ground that its exercise will divert a flow of industrial development from the course which it would follow.

Exclusion of buildings devoted to business, trade, etc., from residential districts bears a rational relation to the **health and safety of the community**. Some of the grounds for this conclusion are **promotion of the health and security from injury of children and others** by separating dwelling houses from territory devoted to trade and industry;

Blue Camp CT, LLC, et al.

v.

Town of Preston Planning and Zoning Commission

May 2024

New London Superior Court

The credibility of the witnesses and the determination of issues of fact are matters solely within the province of the [commission]

The Commission was acting within its authority and was permitted to rely on the testimony of the residents

The Committee was **not obligated to believe the expert that the berm would reduce noise levels**. **"Lay members of the commissions may rely on their personal knowledge concerning matters readily within their competence**." Welch v. Zoning Board of Appeals, 158 Conn. 208, 214, 257 A.2d 795 (1969). **An administrative agency is not required to believe any of the witnesses, including expert witnesses**.

Manor Development Corporation v. Conservation Commission, 180 Conn. 692, 697, 433 A.2d 999 (1980).

General considerations such as public health, safety and welfare, which are enumerated in zoning regulations may be the basis for the denial of a special exception.

When a zoning authority has stated the reasons for its actions, a reviewing court may determine only if the reasons given are supported by the record and are pertinent to the decision. The zoning commission's action must be sustained **if even one** of the stated reasons is sufficient to support it. Daughters of St. Paul, Inc. v. Zoning Board of Appeals, 17 Conn. App. 53, 56-57, 549 A.2d 1076 (1988).

By statute, the Commission must ensure that the special exception application satisfies the standards set forth in the regulations as well as the "conditions necessary to protect the public health, safety, convenience and property values." General Statutes §8-2 (a) (3).1

Plaintiffs argue that there is no substantial evidence to support a denial of the applications.

The **credibility of the witnesses** **and the determination of issues of fact** are matters **solely within the province of the [commission]** .... The question is not whether the trial court would have reached the same conclusion, but **whether the record before the [commission] supports the decision reached** ....

If a **trial court** finds that there is **substantial evidence to support a zoning board's findings**, **it cannot substitute its judgment for that of the board**. ... If there is conflicting evidence in support of the zoning commission's stated rationale, the reviewing court ... cannot substitute its judgment as to the weight of the evidence for that of the commission. .... **The agency's decision must be sustained** if an examination of the record discloses **evidence** that supports **any one of the reasons given**."

In A. Aiudi And Sons, LLC v. Plan. And Zoning Comm'n Of The Town Of Plainville, 267 **Conn**. 192, 203-04, 837 A.2d 748, (**2004**), the ***Supreme Court*** considered a special exception and stated:

> **special [permits],** although expressly permitted by local regulations, **must satisfy** **[certain conditions and] standards set forth in the zoning regulations themselves as well as the conditions necessary to protect the public health, safety, convenience and property values** [as **required** by §8-2] .... Moreover, we have noted that the nature [of special exceptions] is such that their precise location and mode of operation must be regulated because of the **topography, traffic problems, neighboring uses, etc.**, of the site .... We also have recognized that, if not properly planned for, [such uses] might **undermine the residential character of the neighborhood**.

Compatibility with the neighborhood

Resident Margaret Gibson testified that **the project was too big and out of balance with the neighborhood**. The plaintiffs submitted evidence that the campground would be not visible from the adjoining neighborhoods. **Visibility, however, is not the determinative factor in whether the project is compatible with the neighborhood**.

Property Values

Blue Camp, LLC **submitted an appraisal report** for the surrounding properties. . . . **it made the conclusion that property values would not decline**. . . . **The Commission was entitled to credit the testimony of Ballirano and was not obligated to credit the appraisal report submitted by the plaintif**

Traffic

[T]he Commission heard testimony at the public hearing from individuals who questioned the traffic study. The Commission was acting within its authority and was permitted to rely on the testimony of the residents . . . when it made its decision to deny the applications.

Noise

The general criteria states that the use "shall not create excessive and unreasonable noise that is different from what currently exists within the neighborhood. Consideration shall be given to light levels, smoke, odor, gas**, dust or vibration in noxious or offensive quantities, and the distance between offensive processes and adjacent properties**." Town of Preston Regulations § 18.4 (b) (iii). Blue Camp, LLC's engineer submitted a **site plan with a berm that purported to insulate the campground from traffic noise.** The record demonstrates that **several residents testified about their concerns that the berm would not be effective at preventing a disruption in noise**.

The Committee was **not obligated to believe the expert that the berm would reduce noise levels**. "**Lay members of the commissions may rely on their personal knowledge concerning matters readily within their competence**." Welch v. Zoning Board of Appeals, 158 Conn. 208, 214, 257 A.2d 795 (1969). **An administrative agency is not required to believe any of the witnesses, including expert witnesses**. Manor Development Corporation v. Conservation Commission, 180 Conn. 692, 697, 433 A.2d 999 (1980).

"**The subject of noise, as it affects people's lives, is neither sophisticated nor complex**, although technical measuring methods may be." Swaim v. Norwalk Zoning Commission, Superior Court, Docket No. CV96-0151026-S (May 5, 1998, D'Andrea, J.). The Commission was not tasked with measuring the noise level of the campground. Rather, it was tasked with **whether the campground would create an "excessive and unreasonable noise that is different from what currently exists within the neighborhood." The Commission does not need an expert to tell it** that the large amount of patrons expected to stay at the campground is going to lead to an **excessive and unreasonable amount of noise that is different from what currently exists in the neighborhood.**

Preston Planning and Zoning Commission's brief:

The underlying administrative proceeding was an example of how **applicants with essentially unlimited resources** can overwhelm a small rural town commission by **burying it under a mountain of filings** and stonewalling requests for information.

The Commission pushed through these obstacles, and witnesses, **identified deficiencies in the Plaintiffs' evidence**, and relied on **substantial evidence justifying the denial of the Applications**.

Preston Regulations

(b)(i). . . .The use and project **shall be compatible with adjacent established uses and the neighborhood**. The project and its use(s) **shall not degrade or decrease the value of the surrounding properties**.

(b)(ii) Adjacent and feeder street(s) shall have the ability to handle peak traffic loads and **shall not cause traffic hazards**. The use and the extent, nature and arrangement of parking facilities, entrances and exits **shall not create or further aggravate vehicular and pedestrian traffic safety problems**.

(b)(iii). . . . The use(s) **shall not create excessive and unreasonable noise that is different from what currently exists within the neighborhood**. **Consideration shall be given to** light levels, smoke, odor, gas, **dust or vibration in noxious or offensive quantities, and the distance between offensive processes and adjacent properties.**

During the public hearing many speakers also gave testimony as to the fact that the Project would be so large as to be **incompatible** "**with surrounding development**" and the neighborhood, and with "adjacent and establish uses" which directly relates to the general criteria in §18.4(a)(i) and (b)(i) of the Regulations for considering **whether the special permit use is appropriate** for the proposed location.

Additional standards included in §18.4(b)(iii) of the general **criteria that the Project must satisfy are noise and related concerns**; the criteria is that the proposed use "shall not create excessive and unreasonable noise that is different from what currently exists within the neighborhood. Consideration shall be given to light levels, **smoke, odor, gas, dust or vibration in noxious or offensive quantities, and the distance between offensive processes and adjacent properties**." During the public hearing, a number of residents gave testimony as to how the Project would not satisfy these mandatory general criteria for approval.

Plaintiffs have the burden of showing that the Commission acted illegally, arbitrarily or in abuse of the discretion vested in it. Plaintiff must do more than simply show that another decision maker, such as a trial court, might have reached a different conclusion but **must**, instead, **demonstrate that the agency's action is not supported by substantial evidence**.

In reviewing whether the record supports the findings of the Commission, the Court must apply the substantial evidence test:

> [the] decision must be sustained if an examination of the record discloses evidence that supports **any one** of the reasons given .... The evidence, however, to support any such reason must be substantial; [t]he **credibility of witnesses** and the determination of factual issues are matters within the province of the administrative agency.

When ruling on an application **for a special permit, a zoning commission possesses significant discretion to determine whether a proposal meets the standards established in the regulations**

Before a zoning commission can determine whether the specially permitted use is compatible with the uses permitted as of right in the particular zoning district, **it is <u>required</u> to judge whether any concerns**, such as parking or traffic congestion, **would adversely impact the surrounding neighborhood**.

As Plaintiffs admit . . . **they are only allowed only by special exception after a site-specific analysis is undertaken by the Commission** applying both specific regulations related to the use and **more discretionary permitting standards** related to locating it at a particular property. **In order to justify the grant of the special exception, it <u>must</u> appear from the record before the commission that the manner in which the applicant proposes to use his property <u>satisfies all conditions</u> imposed by the regulations**.

Agency
Department of Public Safety

Subject
Storage, Transportation and Use of Explosives and Blasting Agents

Inclusive Sections
§§ 29-349-106—29-349-378

CONTENTS

CHAPTER V. TRANSPORTATION OF EXPLOSIVES

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CHAPTER XIII. FORBIDDEN EXPLOSIVES

Storage, Transportation and Use of Explosives and Blasting Agents

CHAPTER I. DEFINITIONS

Sec. 29-349-106. Terms and definitions

When used in these regulations the following terms and definitions shall prevail:

"Approved" shall mean approved by the State Fire Marshal.

"Artificial barricade" shall mean an artificial mound or revetted wall of earth of a minimum thickness of three feet.

"Barricade" shall mean a natural or artificial barricade.

"Barricaded" shall mean that a building containing explosives is effectually screened from a magazine, building, railway or highway, either by a natural barricade or by an artificial barricade of such height that a straight line from the top of any sidewall of the building containing explosives to the eave line of any magazine, or building, or to a point 12 feet above the center of a railway or highway, will pass through such intervening natural or artificial barricade.

"Blasting Agent" shall mean any material or mixture, consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive and in which none of the ingredients are classified as an explosive, provided that the finished product as mixed and packaged for use or shipment, cannot be detonated by means of a No. 8 test blasting can when unconfined.

NOTE 1. A No. 8 test blasting cap is one containing 2 grams of a mixture of 80% mercury fulminate and 20% potassium chlorate, or a cap of equivalent strength.

NOTE 2: Nitro-Carbo-Nitrate. This term applies to any blasting agent which has been classified as nitro-carbonitrate under the U.S. Department of Transportation Regulations, and which is packaged and shipped in compliance with the regulations of the U.S. Department of Transportation.

"Blasting Cap" shall mean a thin shell closed at one end and containing a detonating charge that is ignited by the flame from safety fuse. It is used for detonating explosives.

"Boosters" shall mean a casing containing several ounces of a high explosive used to increase the intensity of explosion of the detonator or a commercial detonating fuse.

"Carrier" shall mean person, partnerships, associations or corporations who engage in the transportation of articles or materials by rail, highway, water or air.

"Commissioner" shall mean the Commissioner of State Police. "Commercial Detonating Fuse" shall mean a flexible cord with a core of explosives.

"Detonating Primers" shall mean devices used to detonate bursting charges of projectiles for military purposes.

"Distributor" shall mean any person, firm, partnership, asociation or corporation acting as a manufacturer's agent or jobber who deals in explosives and sells to retail dealers or consumers.

"Electric Blasting Cap" shall mean a thin shell closed at both ends containing a detonating charge designed to be ignited by an electric current passed through the two insulated leg

wires that project through the seal of the shell.

"Explosives" shall mean any and all explosives as defined in Section 29-343 of the General Statutes. Explosives are classified as follows:

"Class A Explosives" shall means those possessing detonating or otherwise maximum hazard, such as, but not limited to, dynamite, nitroglycerin, picric acid, lead azide, fulminate of mercury, black powder, blasting caps and detonating primers.

"Class B Explosives" shall mean those possessing flammable hazard, such as propellant explosives (including smokeless powders), photographic flash powders, and some special fireworks.

"Class C Explosives" includes certain types of manufactured articles which contain Class A or Class B explosives, or both, as components but in restricted quantities.

"Explosive Bombs" shall mean a container filled with explosives and provided with a detonating device.

"Explosive-Actuated Power Devices" shall mean any tool or special mechanized device which is actuated by explosives, but not to include propellant-actuated power devices. Examples of explosive-actuated power devices are jet tappers and jet perforators.

"Fire Marshal" shall mean the local fire marshal as defined in Section 29-297 of the General Statutes.

"Forbidden or Not Acceptable Explosives" shall mean explosives which are forbidden or not acceptable for transportation by common carriers by rail freight, rail express, highway or water in accordance with the regulations or with the regulations of the U.S. Department of Transportation. Certain chemicals and certain fuel materials may have explosive characteristics which are not specifically classified by the U.S. Department of Transportation and are not readily classified for coverage in this code. Authoritative information must be obtained for such unclassified materials and action commensurate with their hazards, location, isolation and safeguards, shall be taken.

"Gunpowder" shall mean smokeless powder intended as a propellant explosive for small arms.

"Highway" shall mean any public street, public alley or public road.

"Inspector" shall mean a member of the State Police Department assigned to inspect premises, equipment, and conditions relative to the storage, transportation and use of explosives.

"Inhabited Building" shall mean a building or structure regularly used in whole or part as a place of human habitation. The term "inhabited building" shall also mean any church, school, store, railway passenger station, airport terminal for passengers, and any other building or structure where people are accustomed to congregate or assemble, but excluding any building or structure occupied in connection with the manufacture, transportation, storage and use of explosives.

"License" shall mean the authority granted by the Commissioner of State Police, in writing to manufacture, keep, store, sell, purchase, transport or use explosives. A license for the use of explosives shall not be issued until the applicant exhibits suitable competency

and proficiency and shall submit to such examination and test as said Commissioner may prescribe.

"Magazine" shall mean any building or structure, other than an explosives manufacturing building, approved for storage of explosives.

"Manufacturer" shall mean any person or persons, firm, partnership, association or corporation engaged in the manufacture of explosives.

"Motor Vehicle" shall mean any self-propelled vehicle, truck, tractor, semitrailer, or truck-full trailer used for the transportation of freight over highways.

"Natural Barricade" shall mean natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

"Nitro-Carbo-Nitrate" shall mean any blasting agent which has been classified as nitro-carbo-nitrate under the U.S. Department of Transportation regulations, and which is packaged and shipped in compliance with the regulations of the U.S. Department of Transportation.

"No. 8 Test Blasting Cap" shall mean a blasting cap containing two grams of a mixture of 80% mercury fulminate and 20% potassium chlorate, or a cap of equivalent strength.

"Permit" shall mean the authority granted by the State or Local Fire Marshal in writing to have, keep, store, sell, transport, or use explosives. Such permits shall not be issued until the applicant exhibits an annual state license.

"Person" shall mean any individual, firm, co-partnership, corporation, company, association, joint stock association, and including any trustee, receiver, assignee or personal representative thereof.

"Propellant-Actuated Power Devices" shall mean any tool or special mechanized device or gas generator system which is actuated by smokeless propellant or which releases and directs work through a smokeless propellant charge.

"Public Conveyance" shall mean any railroad car, street car, ferry, cab, bus, airplane or other vehicle which is carrying passengers for hire.

"Pyrotechnics" shall mean any and all fireworks as defined in Section 29-356 of the General Statutes.

"Railway" shall mean any steam, electric, diesel-electric or other railroad or railway which carries passengers for hire on the particular line or branch in the vicinity where explosives are stored or where explosive manufacturing buildings are situated.

"Retail Dealer" shall mean any person or persons, firm, partnership, association or corporation who sells explosives to users of same.

"Small Arms Ammunition" shall mean any shotgun, rifle, pistol or revolver cartridge, and cartridges for propellant-actuated power devices and industrial guns. Military-type ammunition containing high explosives, incendiary, tracer, spotting or pyrotechnic projectiles is excluded from this definition.

"Small Arms Ammunition Primers" (Definition of). Small percussion-sensitive explosive charges, encased in a cup, used to ignite propellant powder.

"Smokeless Propellants" shall mean solid propellants, commonly called smokeless powders in the trade, used in small arms ammunition, cannon, rockets, propellant-actuated power devices, etc.

"Special Industrial Explosives Devices" shall mean any explosive power-packs, which shall include but not be limited to explosive rivets, explosive bolts, tools and other charges of explosives used in special industrial operations including jet tapping steel furnaces and jet perforation in oil well operations.

"Special Industrial Explosive Materials" shall mean shaped materials and sheet forms and various other extrusion, pellets and packages of high explosives which include dynamite, trinitrotoluene, pentaerythrite tetra nitrate, cyclotrimethylene-trinitramine and other similar compounds used for high-energy-rate forming expanding and shaping in metal fabrication, and for dismemberment and quick reduction of scrap metal.

"Storage Farm" shall mean a tract of land properly segregated and used for the storage of explosives in excess of 50,000 pounds in one or more magazines.

"Water Gels or Slurry Explosives" comprise a wide variety of materials used for blasting. They all contain substantial proportions of water and high proportions of ammonium nitrate, some of which is in solution in the water. Two broad classes of water gels are: (a) those which are sensitized by a material classified as an explosive, such as TNT or smokeless powder, and (b) those which contain no ingredient such as aluminum or with other fuels; Water Gels may be premixed at an explosives plant or mixed at the site immeditely before delivery into the borehole.

(Effective December 24, 1987)

Sec. 29-349-107. Classification

In these regulations, explosives are classified as follows:

Class A—Dangerous; Class B—Less Dangerous.

Class A explosives shall include:

Ammunition for cannon with explosive projectiles

Ammunition for cannon with gas projectiles

Ammunition for cannon with illuminating projectiles

Ammunition for cannon with incendiary projectiles

Ammunition for cannon with smoke projectiles

Black Powder

Blasting caps—more than 1,000

Blasting caps with metal clad mild detonating fuse—more than 1,000 Boosters (explosives)

Bursters (explosives)

Charged oil well jet perforating guns (total explosive contents in exceeding 20 lbs.

per motor vehicle)
Detonating primers
Electric blasting caps, more than 1,000 Explosive bomb
Explosive compositions
Explosive mine
Explosive projectile
Explosive torpedo
Fuses, detonating, Class A Explosives
Fuses, detonating, Class A Explosives radioactive Hand grenades
High explosives
High explosives, liquid
Igniters, jet thrust (jato) Class A explosives Initiating explosive
Jet thrust unit (jato) Class A explosives
Low explosives
Propellant explosives, Class A
Rifle grenades
Rocket ammunition with explosive projectiles
Rocket ammunition with illuminating projectiles
Rocket ammunition with gas projectiles
Rocket ammunition with incendiary projectiles
Rocket ammunition with smoke projectiles
Supplementary charges (explosive)

Class B explosives shall include:

Ammunition for cannon with empty projectiles
Ammunition for cannon with inert-loaded projectiles
Ammunition for cannon with solid projectiles
Ammunition for cannon without projectiles
Commercial detonating fuse
Explosive compositions, other than Class A
Explosive power device, Class B
Fireworks, special
Igniters, jet thrust (jato) Class B explosives
Jet thrust unit (jato) Class B explosives

Propellant explosives (liquid) Class B

Propellant explosives (solid) Class B

Propellant explosives in water (smokeless powder for cannon or small arms)

Propellant explosives in water, unstable, condemned or deteriorated (smokeless powder for cannon or small farms)

Railway torpedos

Rocket ammunition with empty projectiles Rocket ammunition with inert-loaded projectiles Rocket ammunition with solid projectiles Rocket ammunition without projectiles

Small arms primers in bulk

Smokeless powder for cannons

Smokeless powder for small arms

Starter cartridges, jet engine, Class B explosives

These regulations are intended to apply to the storage, transportation and use of Class A and Class B explosives as herein defined and are not applied to other explosives except insofar as may be practicable and in the interest of public safety. Industrialists and dealers engaged in the manufacture, processing, storage or transportation of explosives as defined in Section 29-343 of the General Statutes and not covered by these regulations shall secure a special permit from the State Fire Marshal.

(Effective December 24, 1987)

CHAPTER II. LOCAL FIRE MARSHALS

Sec. 29-349-108. Issuance of permits

Local Fire Marshals shall not issue a permit for any magazine not meeting the minimum specifications set forth in these regulations.

(Effective December 24, 1987)

Sec. 29-349-109. Forwarding permits to commissioner

Local Fire Marshals shall retain a copy of each permit issued and shall immediately forward a copy of each permit to the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-110. Refusal of permit

No Local Fire Marshal shall issue a permit to purchase, transport or use explosives until he is shown a license issued by the State Fire Marshal and is satisfied as to the identity of the applicant and as to what use will be made of the explosives.

(Effective December 24, 1987)

Sec. 29-349-111. Notification of permit refusal to State Fire Marshal

Whenever a Local Fire Marshal shall refuse to issue a permit to any person for the purchase, transportation or use of explosives, he shall immediately notify the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-112. Reporting violations

Whenever a Local Fire Marshal finds evidence of a violation of a statute or regulations relative to the storage, transportation, or use of explosives, he shall immediately bring the matter to the attention of the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-113. Permit application

Every person desiring a permit to keep, store, sell, or deal in explosives shall make written application to the Local Fire Marshal. Said application shall be in duplicate on forms provided by the State Fire Marshal. On receipt of such application, the Local Fire Marshal shall proceed to make such inquiry as is necessary to determine whether the applicant is licensed by the State Fire Marshal and the magazine or premises meets all the requirements of these regulations and the applicable statutes. On finding that the magazine or premises complies with all statutory and regulatory requirements, the Local Fire marshal shall issue a permit to keep, store, sell and deal in explosives for a period of not more than one year. On finding that the magazine or premises do not comply with all statutory or regulatory requirements, the Local Fire Marshal shall refuse to issue a permit. Said denial shall be in writing, and shall contain the reason for the refusal. The Local Fire Marshal shall mail to the State Fire Marshal a copy of each application and each permit granted, or if the application was denied a copy of the denial.

(Effective December 24, 1987)

Sec. 29-349-114. Revocation of license or permit for violations

Any license or permit issued in accordance with these regulations may be revoked at any time by State Fire Marshal for good cause.

(Effective December 24, 1987)

CHAPTER III. MANUFACTURING AND SALES OF EXPLOSIVES

Sec. 29-349-115. Manufacture of explosives

The manufacture of any explosive or small arms ammunition shall be prohibited within the State of Connecticut unless such manufacture is authorized by the State Fire Marshal and is conducted in accordance with recognized safe practices satisfactory to the State Fire Marsal. This shall not apply to hand loading of small arms and ammunition prepared for non-commercial use and not for resale, provided that no more than 50 pounds of smokeless

powder and no more than 10,000 primers are kept in a single building. All primers and smokeless powder in such hand loading operations must be kept in their factory containers except those which are placed in the loading device.

(Effective December 24, 1987)

Sec. 29-349-116. Manufacture of explosives when prohibited

The manufacture of explosives or pyrotechnics within the State of Connecticut shall be prohibited when such manufacture presents an undue hazard of life and property as determined by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-117. When storage prohibited

No person shall store, handle or transport explosives or blasting agents when such storage, handling or transportation of explosives or blasting agents constitutes an undue hazard to life or property.

(Effective December 24, 1987)

Sec. 29-349-118. Licensed person to receive explosives

No person shall sell or give away any explosive or blasting agent to any person not holding a license to receive same.

(Effective December 24, 1987)

Sec. 29-349-119. Prohibited in public places

No person shall sell, display or expose for sale any explosive or blasting agent on any highway, street, sidewalk, public way or public place.

(Effective December 24, 1987)

Sec. 29-349-120. Exemption for U.S. Pharmacopeia

Nothing in these regulations shall be construed to prohibit the use of explosives in the form prescribed by the official United States Pharmacopeia.

(Effective December 24, 1987)

Sec. 29-349-121. Requirements for laboratories and institutes

Industrial laboratories, laboratories of technical institutes, colleges, universities, and similar institutions may be permitted to keep, store and use explosives or blasting agents when confiend to the purpose of scientific or technical instruction or research, provided the storage and use of explosives or blasting agents is conducted or supervised by a person licensed by the State Fire Marshal and not more than 50 pounds of explosives or blasting agents are kept on hand at any time in such laboratories. When additional quantities of explosives or blasting agents are required, application shall be made for special ruling by

the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-122. Restrictions of explosives quantities

The State Fire Marshal or the Local Fire Marshal may restrict the quantity of explosives or blasting agents at any time, when such storage, handling or transportation constitutes an undue hazard to life or property.

(Effective December 24, 1987)

Sec. 29-349-123. Records

Each person, firm or corporation engaged in the manufacture of explosives, explosive compounds or fuse shall keep a daily record of each person other than employees entering upon their magazine site. Such information shall be filled in by the Company's office, and shall be open to inspection by the State and Local Fire Marshal and law enforcement officers.

(Effective December 24, 1987)

Sec. 29-349-124. Receiver must be licensed

No person, firm or corporation shall sell, deliver, give or otherwise convey any explosives to any person, firm or corporation in this state who is not the holder of a permit or license from the State or Local Fire Marshal, except as noted in Sec. 29-349-115.

(Effective December 24, 1987)

Sec. 29-349-125. Manufacturing of explosives. Protection

The entire occupied portion of the premises of an explosives manufacturing building shall be enclosed by a suitable fence to enable the management to have control of all persons entering such premises. There shall be sufficient number of notices conspicuously posted warning of the business conducted herein.

(Effective December 24, 1987)

CHAPTER IV. STORAGE OF EXPLOSIVES

Sec. 29-349-126. Required magazines for explosives

Class I magazines shall be required where the quantity of explosives stored is more than 50 pounds. Class II magazines may be used where the quantity of explosives stored is 50 pounds or less, except that the authority having jurisdiction may authorize the use of Class II magazines for the temporary storage at blasting sites of larger quantities of explosives.

(Effective December 24, 1987)

Sec. 29-349-127. Requirements for classes of explosives

All Class A, Class B, and Class C special industrial explosives, and any newly developed

and unclassified explosives, shall be kept in magazines which meet the requirements of these regulations. This shall not be construed as applying to the following:

(a) Stocks of small arms ammunition, propellant-actuated power cartridgs, small arms ammunition primers in quantities of less than 750,000 and smokeless propellant in quantities of less than 750 pounds (see Chapter XII)

(b) Special industrial explosives devices when in quantities of less than 50 pounds net weight of explosives.

(c) Fuse lighters and fuse igniters.

(d) Safety fuse (safety fuse does not include cordeau detonating fuse).

(e) Explosives kept in the manufacturing area for manufacturing purposes.

(Effective December 24, 1987)

Sec. 29-349-128. Prohibited storage

No explosives in any quantity whatsoever shall be stored or kept in any building used in whole or in part as a school, theater or other place of public assembly or gathering.

(Effective December 24, 1987)

Sec. 29-349-129. Blasting caps

Blasting caps, electric blasting caps, detonating blasting primers and primed blasting cartridges shall not be stored in the same magazine with other explosives.

(Effective December 24, 1987)

Sec. 29-349-130. Magazines to be locked

Each magazine shall be kept securely locked at all times, except when explosives are being placed therein or removed therefrom.

(Effective December 24, 1987)

Sec. 29-349-131. Authorized persons for magazines

Only competent authorized persons over 21 years of age shall have access to or control of magazines.

(Effective December 24, 1987)

Sec. 29-349-132. Storage of detonating fuse

Commercial detonating fuse shall be stored in an explosives magazine, but shall not be stored with blasting caps, electric blasting caps, or primed cartridges.

(Effective December 24, 1987)

Sec. 29-349-133. Magazine inventory

A running inventory of the contents of each magazine shall be kept either in the office of the magazine keeper or in the magazine. This inventory shall be available for inspection by an Inspector or by the Local Fire Marshal. In the case of guarded storage farms or

manufacturing areas, it will be sufficient if regularly scheduled daily or weekly inventories are made and appropriate records kept as mentioned above.

(Effective December 24, 1987)

Sec. 29-349-134. Opening packages of explosives

Packages of explosives shall not be unpacked or repacked in a magazine nor within 50 feet of a magazine or in close proximity to other explosives. Tools used for opening packages of explosives shall be constructed of non-sparking materials. Opened packages of explosives shall be securely closed before being returned to a magazine.

(Effective December 24, 1987)

Sec. 29-349-135. Smoking prohibited

Smoking, matches, open flames, spark producing devices and firearms are prohibited inside of or within 50 feet of any magazine or in or around any trucks, powder cars, wagons, or other vehicles containing explosives. Combustible materials shall not be stored within 50 feet of any magazine.

(Effective December 24, 1987)

Sec. 29-349-136. Adjacent land to be clear

Ground around permanent magazines shall slope away for drainage. The land surrounding magazines shall be kept clear of brush, dried grass, leaves and other combustible materials for a distance of at least 50 feet.

(Effective December 24, 1987)

Sec. 29-349-137. Explosives containers

Except while being used, no person shall have, keep or store explosives at any place within this State unless such explosives are completely encased or enclosed in metallic, wooden, rubber, fiber or plastic containers. Containers in which explosives are handled outside of manufacturing areas shall be plainly marked with the make and type of explosives contained therein.

(Effective December 24, 1987)

Sec. 29-349-138. Cleaning of magazine floor stains

Magazine floors stained with nitroglycerin shall be scrubbed well with a stiff broom, hard brush or mop, using an ample volume of a solution in the proportion of 1½ quarts of water, 3½ quarts of denatured alcohol, one quart of acetone and one pound of sodium sulfide (60% commercial). The liquid shall be used freely to decompose the nitroglycerin thoroughly. In the event the nitroglycerin is on any material which is impervious to nitroglycerin, this area should be swept thoroughly with dry sawdust and destroyed by burning. Nitroglycerin remover should be stored in closed container and kept in a dark

place. Nitroglycerin remover more than 60 days old shall not be used.

(Effective December 24, 1987)

Sec. 29-349-139. Prohibited storage other than explosives

Magazines shall not be used for the storage of flammable materials, oil, paint, carbide, metal, metal tools, machinery or any other article with the exception of portable conveyors made of non-ferrous metals.

(Effective December 24, 1987)

Sec. 29-349-140. Storage of stock

All stocks of explosives shall be stored so as to be easily counted and checked. Packages of explosives shall be piled in a stable manner.

(Effective December 24, 1987)

Sec. 29-349-141. Alterations in magazine

No alteration changing the storage capacity of a magazine shall be made without notifying the State or Local Fire Marshal. When magazines need inside repairs, all explosives shall be removed therefrom. In making outside repairs, if there is a possibility of causing sparks or fire then the explosives shall be removed from the magazine. Explosives removed from a magazine under repair shall be either placed in another magazine or placed a safe distance from the magazine where they shall be properly guarded and protected until repairs have been completed, when they then shall be returned to the magazine.

(Effective December 24, 1987)

Sec. 29-349-142. Magazine housekeeping

Magazine floors shall be regularly swept, kept clean, dry, free of grit, paper, empty used packages and rubbish. Brooms and other cleaning utensils shall not have any spark-producing metal parts. Sweepings from the floor of magazines shall be disposed of by burning in accordance with methods approved by the Local or State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-143. Leaking or deteriorating explosives

When any explosive has deteriorated to an extent that it is in an unstable or dangerous condition, or if nitroglycerin leaks from any explosive or if any explosive is unfit for use for any reason, or when any blasting caps, electric blasting caps, delay electric blasting caps, electric squibs and delay electric squib have so deteriorated from age, improper storage or are unfit for use for any other reason, then the person in possession of such explosive or device shall immediately report the fact to the Local Fire Marshal, and upon his authorization shall proceed to destroy such explosive or device in accordance with safe practices. Only competent persons shall do the work destroying these materials. Any manufacturer, distributor, wholesaler, dealer or user of explosives who files a description

of his manner of destruction of these materials with the State Fire Marshal for approval may destroy these materials without authorization of the Local Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-144. Prohibited disposal

Detonators of explosives shall not be disposed of by throwing them into a body of water.

(Effective December 24, 1987)

Sec. 29-349-145. Empty containers

Except for such re-usable containers approved by the U.S. Department of Transportation, containers used in the manufacturing process and small arms cartridges, no explosive container, box liner, empty bags, sawdust or cartridge shall be used again for any purpose. Empty containers of the aforesaid types shall be carefully collected and destroyed in accordance with the instructions of the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-146. Reduction of capacity of magazine. Relocation

Whenever any buildings are erected or new railroad tracks or highways are constructed near a magazine, the permissive capacity of such magazine shall be reduced to conformity with the American Tables of Distances for the storage of explosives. Whenever any such new construction is begun requiring the reduction of the capacity of a magazine, such fact shall be reported to the State Fire Marshal without delay. The State or Local Fire Marshal may order the magazine abandoned or relocated.

(Effective December 24, 1987)

Sec. 29-349-147. Initiator storage

Initiators (primary explosives) in bulk in an amount not exceeding 1,500 pounds at any one time, except at an explosives factory, shall be stored in a wet condition, and shall contain not less than 25% water.

(Effective December 24, 1987)

Sec. 29-349-148. Guncotton storage

Guncotton, containing not less than 20% water, may be stored in an amount not exceeding 250,000 pounds at any one time in a building, provided such building is used exclusively for that purpose.

(Effective December 24, 1987)

Sec. 29-349-149. Soluble or negative cotton storage

Soluble or negative cotton in a dry form may be kept for sale in a wholesale drug or photographic supply store in an amount not exceeding 6 pounds at any one time in packages containing not more than one ounce each, and may be kept for sale in a retail store in an

amount not exceeding 2 pounds at any one time, in packages containing not more than one ounce each.

(Effective December 24, 1987)

Sec. 29-349-150. Removal of explosives

The State or Local Fire Marshal may at his discretion, at any time he deems necessary for public safety, require the removal of any explosives from any location or require that a watchman be placed continuously in charge of same.

(Effective December 24, 1987)

Sec. 29-349-151. Inspection of magazines

All magazines will be periodically inspected by the Local or State Fire Marshal and their agents, and the inspecting official shall notify the owner of a magazine not meeting the minimum safety factors set forth in these regulations to improve or abandon the magazine. Such notification shall be in writing and shall give the owner a reasonable length of time, taking all the surrounding circumstances into consideration, to complete the improvements or abandonment.

(Effective December 24, 1987)

Sec. 29-349-152. Reporting of accident, etc.

All accidents, thefts or fires occurring with the keeping or storing of explosives shall be reported to the Local Fire Marshal immediately by verbal communication and, within 24 hours, shall be reported in detail, in writing, to the State Fire Marshal on forms provided.

(Effective December 24, 1987)

Sec. 29-349-153. Lights in magazines

Magazines in manufacturing areas may be provided with artificial lighting only if such lighting system complies with the applicable requirements of Articles 500 through 503 of the National Electrical Code consistent with the hazards present in the magazines. No other magazines shall be provided with artificial light, except that if artificial lights are necessary only electric safety flash lights or safety lanterns shall be used.

(Effective December 24, 1987)

Sec. 29-349-154. Artificial heat in magazines

Artificial heat shall not be provided in magazines, except in manufacturing areas where artificial heating may be used only if low pressure steam or hot water is used as the heating medium.

(Effective December 24, 1987)

Sec. 29-349-155. Magazine location

All magazines shall be located away from inhabited buildings, passenger railways, public

buildings and other magazines in conformity with the American Table of Distances for the storage of explosives.

(Effective December 24, 1987)

Sec. 29-349-156. Magazine construction

Magazines for the storage of Class A explosives shall be bullet-resistant, weather-resistant, fire-resistant, ventilated sufficiently to protect the explosive in the specific locality. Class 1 and Class 2 magazines shall be protected from lightning in accordance with the N.F.P.A. Lightning Protection Code. Magazines used only for the storage of Class B explosives shall be weather-resistant, fire-resistant and have ventilation. Magazines for the storage of blasting and electric blasting caps shall be weather-resistant, fire-resistant and ventilated. Underground storage in Class 1 and Class 2 magazines is prohibited without approval by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-157. Magazine classification

Magazines as required by these regulations shall be of four classes:

(a) Class 1 for the permanent storage of explosives.

(b) Class 2 for the temporary storage of explosives.

This magazine must meet all the requirements of a Class 1 magazine, except the foundation may be omitted and skids or wheels may be used.

(c) Class 3, daily supply magazine—capacity not to exceed 200 pounds, with or without wheels.

(d) Class 4, rental supply magazine—mounted on wheels, capacity not to exceed 50 pounds.

(Effective December 24, 1987)

Sec. 29-349-158. Magazine construction conformity

Magazines shall be constructed in conformity with the provisions of these regulations, or may be of substantially equivalent construction satisfactory to the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-159. Warning signs

Property upon which magazines are located outside of buildings shall be posted with signs, reading "Explosives—Keep Off." Such signs shall be located so as to minimize the possibility of bullet traveling in the direction of the magazines if anyone shoots at the sign.

(Effective December 24, 1987)

Sec. 29-349-160. Class 1 and Class 2 Magazines

Magazines of this category shall be of masonry construction or of wood or metal construction, or a combination of these types, and shall be bullet-resistant. Thickness of

masonry units shall not be less than 8 inches. Hollow masonry units used in construction shall have all hollow spaces filled with weak concrete or well tamped sand. Wood constructed walls shall be constructed of 1-inch minimum thickness tongue and grooved hardwood lumber, shall have at least a six inch space between interior and exterior sheathing, and the space between sheathing shall be filled with well tamped sand. Metal wall construction shall be lined with a brick at least four inches in thickness or shall have at least a six inch sand fill between interior and exterior walls, or may be constructed of 3/8 inch thick steel plate walls with 2-5/8 inch thick hardwood lining or equivalent construction approved by the State Fire Marshal. Interior walls shall be constructed of or covered with non-sparking material.

(Effective December 24, 1987)

Sec. 29-349-161. Floor and roof construction

Floors and roofs of masonry magazines may be of wood construction. Wood floors shall be tongue and grooved lumber having a minimum thickness of one inch.

(Effective December 24, 1987)

Sec. 29-349-162. Roof-bullet resistant

If the roof of a Class 1 or Class 2 magazine can be shot into from higher ground, it shall be protected by a sand tray or 4 inches of hardwood located at the line of eaves and covering the entire area except that necessary for ventilation. Sand in the sand tray shall be maintained at a depth of not less than 4 inches, or equivalent construction approved by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-163. Exterior magazine covering

All wood at the exterior of magazines, including eaves, shall be protected by being covered with black or galvanized steel or aluminum metal of thickness not less than No. 26 gauge. All nails exposed to the interior shall be well countersunk.

(Effective December 24, 1987)

Sec. 29-349-164. Foundations

Foundations for magazines shall be of substantial construction and arranged to provide good cross ventilation. The ground around such foundations shall slope away sufficiently for proper drainage.

(Effective December 24, 1987)

Sec. 29-349-165. Ventilation

Magazines shall be ventilated sufficiently to prevent dampness and heating of stored explosives. Ventilating openings shall be screened to prevent the entrance of sparks.

(Effective December 24, 1987)

Sec. 29-349-166. Magazine door construction

Openings to magazines shall be restricted to that necessary for the placement and removal of stocks of explosives. Doors shall be constructed of 3/8 inch plate steel and lined with 2-5/8 inches of hardwood. Hinges and hasps shall be attached to the doors by welding, riveting or bolting (nuts on inside of door). They shall be installed in such a manner that the hinges and hasps cannot be removed when the doors are closed and locked.

(Effective December 24, 1987)

Sec. 29-349-167. Magazine locking and protection

Magazines shall be provided with substantial means for locking and protection. A complete tamper proof locking assembly, approved by the State Fire Marshal, shall be provided and magazine doors shall be kept locked, except during the time of placement and removal of stocks of explosives. When deemed necessary by the State Fire Marshal, due to unusual hazard, such magazines shall be enclosed by at least a six foot manproof fence, and/or shall be further protected by continuous surveillance by an electronic sensing device which shall notify the proper authorities upon unauthorized penetration of the magazine area.

(Effective December 24, 1987)

Sec. 29-349-168. Prohibited stock piling

Provisions shall be made to prevent the piling of stocks of explosives directly against masonry walls, brick lined or sand filled metal walls and single thickness metal walls; such protection, however, shall not interfere with proper ventilation at interior of side and end walls.

(Effective December 24, 1987)

Sec. 29-349-169. Class 3 and Class 4 magazines

Magazines shall be of wood or metal construction or a combination thereof.

(Effective December 24, 1987)

Sec. 29-349-170. Wood and metal magazine construction

Wood magazines of this class shall have sides, bottom, and cover constructed of 2 inch thick hardwood boards well braced at corners and protected by being entirely covered with sheet metal of not less than No. 20 gauge. All nails exposed to interior of the magazine shall be well countersunk. All metal magazines of this class shall have sides, bottom, and cover constructed of sheet metal, and shall be lined with 3/8 inch plywood or the equivalent, including nonferrous metal. Edges of metal covers shall overlap sides at least one inch.

(Effective December 24, 1987)

Sec. 29-349-171. Magazine cover construction

Covers for both wood and metal constructed magazines of these classes shall be provided

with substantial strap hinges and shall be provided with substantial means of locking. Covers shall be kept locked except during the placement and removal of explosives.

(Effective December 24, 1987)

Sec. 29-349-172. Warning signs

Magazines of this class shall be painted red and shall bear lettering in white, on all sides and top, at least 3 inches high, "Explosives—Keep Fire Away"—Class 4 magazines when located in warehouses, wholesale or retail establishments, shall be provided with substantial wheels or casters to facilitate removal in case of fire.

(Effective December 24, 1987)

Sec. 29-349-173. Ventilation

Class 3 and Class 4 magazines shall provide adequate means of ventilation.

(Effective December 24, 1987)

Sec. 29-349-174. Explosives storage within building

Class 4 magazines shall be permitted in warehouses, wholesale and retail establishments when located on a floor which has an entrance at outside grade level and the magazine is located not more than 10 feet from such an entrance. Two Class 4 magazines may be located in the same building when one is used for blasting caps in quantities not in excess of 5,000 caps and a distance of 10 feet is maintained between magazines. The location of a Class 4 magazine within a building shall not be changed without the approval of the State or Local Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-175. Class 3 magazines. Limitation on storage

Not more than 200 pounds of explosives shall be stored or kept in a Class 3 magazine. No explosives shall be kept at night or when blasting is inactive in a Class 3 magazine except under conditions approved by Local Fire Marshal or the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-176. Class 4 magazines. Limitation on storage

Not more than 50 pounds of explosives shall be stored or kept in a Class 4 magazine.

(Effective December 24, 1987)

CHAPTER V. TRANSPORTATION OF EXPLOSIVES

Sec. 29-349-177. Permits by local fire marshal

No Local Fire Marshal shall issue a permit to transport more than 50 pounds of explosives or more than 1,000 blasting caps or electric blasting caps in any suitable vehicle. A Local Fire Marshal may issue a permit to transport a maximum of 200 pounds of explosives in a

vehicle carrying a Class 3 magazine or its equivalent. The transportation of blasting caps or electric blasting caps in the same vehicle containing other explosives is prohibited.

(Effective December 24, 1987)

Sec. 29-349-178. Permits by state fire marshal

Only the State Fire Marshal, or his designated representatives shall approve and issue permits for the transportation of explosives in vehicles carrying more than 200 pounds of explosives or more than 1,000 blasting caps or electric blasting caps, and such vehicles shall meet all the requirements of the State Fire Marshal as set forth in these regulations.

(Effective December 24, 1987)

Sec. 29-349-179. Vehicle approval

Vehicles transporting more than 200 pounds of explosives or more than 1,000 blasting caps or electric blasting caps shall be required to have the approval of the State Fire Marshal. Vehicles of this classification shall be a Truck or Truck-tractor with semi-trailer.

(Effective December 24, 1987)

Sec. 29-349-180. Blasting cap transportation

A maximum of 5,000 blasting caps or electric blasting caps may be transported on the same approved vehicle as follows: The blasting caps or electric blasting caps shall be packed in authorized D.O.T. specifications outside shipping containers; or in prescribed inside D.O.T. packages in an outside box made of one inch lumber with suitable padding material not less than one-half inch thick, or a box made of not less than 12 gauge sheet metal lined with plywood or other suitable material not less than 3/8 inch thick so that no metal is exposed. Hinged cover and fastening devices are required on such boxes. These boxes shall be loaded in approved vehicles so that contents or box will be immediately accessible for removal.

(Effective December 24, 1987)

Sec. 29-349-181. Loading or unloading precautions

In loading or unloading any explosives or blasting caps or electric blasting caps, care shall be taken in the handling of same, and they shall be so placed or stowed as to prevent displacement during transit.

(Effective December 24, 1987)

Sec. 29-349-182. Description of vehicle

The body of each such vehicle shall be fully enclosed. The doors shall be equipped with strong hinges securely bolted on the inside and provided with two suitable padlocks which shall be kept locked at all times when explosives are being carried. The underside of the body, together with the front end and sides of the body, shall be made fire-resistive by being covered with ¼ inch of sheet asbestos which, in turn shall be covered by 20 gauge

galvanized iron or equivalent. The entire body, including the doors, should be so constructed that no bolt, screws, nails, or other metals shall be exposed on the inside thereof. Any exposed spark-producing metal on the inside of the body shall be covered with wood or other non-sparking material to prevent contact with packages of explosives.

(Effective December 24, 1987)

Sec. 29-349-183. Warning signs

Each vehicle carrying explosives shall bear signs on the front, rear and each side bearing the word "EXPLOSIVES" in letters not less than 4 inches in height. The lettering shall be in white. Approved vehicles shall be painted in a bright red.

(Effective December 24, 1987)

Sec. 29-349-184. Owner to inspect

It shall be the duty of the person to whom a permit has been issued to transport explosives in vehicles of this classification to inspect daily or cause to be inspected daily those vehicles employed by him to determine that:

(a) Fire extinguishers are filled and in operating condition.

(b) Electric wires are insulated and securely fastened to prevent short circuit.

(c) The motor, chassis and body are reasonably clean and free of excess grease and oil.

(d) The fuel tank and fuel lines are securely fastened and not leaking.

(e) Brakes, lights, horn, windshield wiper, and steering mechanism are functioning properly.

(f) Tires are properly inflated and free of defects.

(g) The vehicles shall be in proper condition in every other respect and acceptable for handling explosives.

(h) All warning signs are clean and clearly legible.

(Effective December 24, 1987)

Sec. 29-349-185. Fire extinguishers

Each such vehicle shall be equipped with two approved fire extinguishers carrying a minimum rating of 6BC each and approved by a fire equipment testing laboratory recognized by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-186. Prohibited routes

Explosives shall not be transported through any prohibited vehicular tunnel, or subway, or over any prohibited bridge, roadway, or elevated highway.

(Effective December 24, 1987)

Sec. 29-349-187. Prohibited transportation in a public conveyance

Explosives shall not be carried or transported in or upon a public conveyance or vehicle

carrying passengers for hire.

(Effective December 24, 1987)

Sec. 29-349-188. Vehicles to stop at railroad crossings

All commercial vehicles carrying explosives shall come to a full stop before crossing any railroad tracks. Such vehicles shall display a sign with the letters at least two inches high reading "THIS VEHICLE STOPS AT ALL RAILROAD CROSSINGS." Such a sign shall be displayed in such a manner as to be visible to all vehicles approaching from the rear.

(Effective December 24, 1987)

Sec. 29-349-189. Alternate routing

Vehicles transporting explosives shall be routed to avoid congested traffic and densely populated areas whenever practical. Where routes through congested areas have been designated by local authorities such routes shall be followed.

(Effective December 24, 1987)

Sec. 29-349-190. Driver to be licensed by state fire marshal

Vehicles transporting explosives shall only be driven by and be in charge of a driver licensed by the State Fire Marshal to transport explosives. The driver must be physically fit, careful, capable, reliable, able to read and write the English language proficiently, and not addicted to the use or under the influence of intoxicants, narcotics, or drugs, and not less than 21 years of age. He shall be familiar with the traffic regulations, State laws, and the provisions of these regulations, and possess a valid motor vehicle operator license.

(Effective December 24, 1987)

Sec. 29-349-191. Vehicle for repair or storage

Vehicles containing explosives shall not be taken into a garage or repair shop for repair or storage.

(Effective December 24, 1987)

Sec. 29-349-192. Vehicle to be attended

Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by the driver or other qualified attendant of the motor carrier. This attendant shall have been made aware of the class of the explosive material in the vehicle and of its inherent dangers, and shall have been instructed in the measures and procedures to be followed in order to protect the public from those dangers. He shall have been made familiar with the vehicle he is assigned to attend, and shall be trained, supplied with the necessary means, and authorized to move the vehicle when required.

(a) For the purpose of this section, a vehicle shall be deemed "Attended" only when the driver or other qualified attendant is physically on or in the vehicle, or has the vehicle within

his field of vision and can reach it quickly and without any kind of interference; "attended" also means that the driver or attendant is awake, alert and not engaged in other duties or activities which may divert his attention from the vehicle, except for necessary communication with public officers, or representatives of the carrier, shipper or consignee.

(b) However, an explosive laden vehicle may be left unattended if parked within a securely fenced or walled area with all gates or entrances locked, in a nonhazardous location, where the parking of such vehicle is otherwise permissible.

(Effective December 24, 1987)

Sec. 29-349-193. Certain substances prohibited

No spark-producing metal, or spark-producing metal tools, oils, matches, firearms, electric storage batteries, flammable substances, acids, oxidizing materials, or corrosive compounds shall be carried in the body of any motor truck and/or vehicle transporting explosives, unless the loading of such dangerous articles and the explosives comply with the U.S. Department of Transportation regulations.

(Effective December 24, 1987)

Sec. 29-349-194. Transfer of explosives

Explosives shall not be transferred from one vehicle to another within the State of Connecticut without informing the local fire and police authorities. In the event of a breakdown or collision, the Local Fire and Police Departments and the State Police Department shall be promptly notified to help safeguard such emergencies. Explosives shall be transferred from the disabled vehicle to another only when proper and qualified supervision is provided.

(Effective December 24, 1987)

Sec. 29-349-195. Vehicle parking restrictions

Except under emergency conditions, no vehicle transporting explosives shall be parked before reaching its destination, even though attended, on any street adjacent to or in proximity to any bridge, tunnel, dwelling, building or place where people work, congregate or assemble.

(Effective December 24, 1987)

Sec. 29-349-196. Distance between vehicles

Vehicles loaded with explosives shall keep at least 1,000 feet apart.

(Effective December 24, 1987)

Sec. 29-349-197. Passengers prohibited

Unauthorized persons shall not ride on vehicles transporting explosives.

(Effective December 24, 1987)

Sec. 29-349-198. Smoking and carrying firearms prohibited

No person shall smoke, carry matches or any flame-producing device, or carry any firearms or loaded cartridges (except law enforcement officers in the performance of their duties) in or near a motor vehicle transporting explosives; or drive, load or unload such vehicle in a careless or reckless manner.

(Effective December 24, 1987)

Sec. 29-349-199. Packing

When explosives are being transported, they shall be packed in strong containers suitable for the purpose. Each box, container, or case shall be plainly marked stating the make and type of explosive contained therein.

(Effective December 24, 1987)

Sec. 29-349-200. Vehicle loading and delivery of explosives

Vehicles shall be loaded in such a manner as to prevent displacement during transit. No bail-hook or metal tools, except portable conveyors made of non-ferrous metals shall be used in loading or unloading explosives. Delivery shall only be made to authorized persons and into authorized magazines or approved temporary storage or handling areas.

(Effective December 24, 1987)

Sec. 29-349-201. Railroad cars

All railroad cars loaded with explosives shall be promptly unloaded and their contents transported to licensed magazines in approved vehicles. Except during the actual unloading, such cars shall be securely locked.

(Effective December 24, 1987)

Sec. 29-349-202. Interstate transportation

There shall be no interstate transportation of explosives into this State except in accordance with the rules and regulations of the U.S. Department of Transportation.

(Effective December 24, 1987)

CHAPTER VI. USE OF EXPLOSIVES AND BLASTING AGENTS

Sec. 29-349-203. Record of shots fired

Each user of explosives for commercial blasting purposes shall keep a log book showing in detail, shots fired by him, giving the quantity of explosives used in each shot, the types, the date, time, name of the land owner, location in which the shot was fired, and the authority issuing the permit. Records shall be in a bound book not loose-leaf, and shall include the number of holes, diameter, depth and spacing, pounds, and type of explosives used, number of delay fuses, results of blast, and precautions taken.

(Effective December 24, 1987)

Sec. 29-349-204. User, without magazine, limited to daily requirements

No user of explosives not having a licensed magazine shall have in his possession explosives beyond his daily requirements.

(Effective December 24, 1987)

Sec. 29-349-205. Experienced persons only

The handling of explosives may be performed by the person holding a permit to use the explosives or by other employees under his direct supervision provided that such employees are at least 21 years of age.

(Effective December 24, 1987)

Sec. 29-349-206. Protection of persons and property

(a) Persons authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution, including but not limited to warning signals, flags, barricades or woven wire mats to insure the safety of the general public and workmen.

(b) In every case where a possibility exists either of a serious complaint or actual property damage from blasting vibration, the user shall provide approved seismic instrumentation to determine the actual magnitude of such ground vibration. The State Fire Marshal, may, on his own initiative, order the use of such instrumentation conducted by a professional service, and may determine the maximum vibration level.

(Effective December 24, 1987)

Sec. 29-349-207. On the job explosives. Container

Original containers or Class 3 magazines shall be used for taking detonators and other explosives from storage magazines to the blasting area.

(Effective December 24, 1987)

Sec. 29-349-208. Smoking, drugs, liquor. Prohibited

When explosives are being handled or used, smoking shall not be permitted and no one near the explosives shall possess matches, open light or other fire or flame. No person shall handle explosives when under the influence of liquor or drugs.

(Effective December 24, 1987)

Sec. 29-349-209. Blasting precautions

When blasting is done in congested areas or in close proximity to a structure, railway or highway or any other installation that may be damaged, the blaster shall take special precautions in the loading, delaying, initiation and/or confinement of each blast with mats or other methods so as to control the throw of fragments, and thus prevent bodily injury or property damage.

(Effective December 24, 1987)

Sec. 29-349-210. Blasting on Sunday

Blasting operations may not be conducted on Sundays or between sunset and sunrise, except with special permission of the State or Local Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-211. Removal of explosives from magazine

No more than a reasonably necessary quantity of explosives or detonators shall be removed from the storage magazines.

(Effective December 24, 1987)

Sec. 29-349-212. Blasting precautions for areas of public utilities

Whenever blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph and steam utilities, the blaster shall notify the appropriate representative of such utilities and the Local Fire Marshal at least 24 hours in advance of blasting, specifying the location and intended time of such blasting. Verbal notice shall be confirmed with written notice. In an emergency, this time limit may be waived by the State or Local Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-213. Warning signs

During the period of any blasting operation which is being initiated electrically, the blaster, contractor, or person in charge shall cause signs to be erected on all adjacent highways at a point 350 feet from the blasting site to warn motorists not to use two-way radios. These signs shall be placed on the road just prior to the loading of the holes, and shall be removed immediately after the blast is completed.

(Effective December 24, 1987)

Sec. 29-349-214. Blasting caps

Electric blasting caps of different manufacturers shall not be used in the same blast regardless of the manner of connection.

(Effective December 24, 1987)

Sec. 29-349-215. Amount of explosives at blast site

Under no circumstances shall the amount of explosives taken into a blast area exceed the amount estimated by the blaster as necessary for the blast. Such explosives shall be properly stacked and at such distance apart that any premature explosion will not be likely to propagate from one pile to another.

(Effective December 24, 1987)

Sec. 29-349-216. Empty containers. Destruction

Empty boxes and paper and fiber packing materials which have previously contained

explosives shall not be used again for any purpose, but shall be destroyed by burning at an approved isolated location out of doors, and no person shall be nearer than 100 feet after the burning has started.

(Effective December 24, 1987)

Sec. 29-349-217. Use of damaged material

Explosives or blasting equipment that are obviously deteriorated or damaged shall not be used.

(Effective December 24, 1987)

Sec. 29-349-218. Abandoned explosives

No explosives shall be abandoned.

(Effective December 24, 1987)

Sec. 29-349-219. Open flames prohibited

No open flame light shall be used in the vicinity of explosives.

(Effective December 24, 1987)

Sec. 29-349-220. Blasting operations

Blasting operations shall be conducted in accordance with nationally recognized good practices.

(Effective December 24, 1987)

Sec. 29-349-221. Water soaked explosives

No person shall attempt to reclaim or use blasting caps, electric blasting caps or other explosives that have been water soaked, even if dried out.

(Effective December 24, 1987)

Sec. 29-349-222. Minimum current

A circuit shall not be fired electrically with less than the minimum current specified by the manufacturer.

(Effective December 24, 1987)

Sec. 29-349-223. Blasting cap containers

Electric blasting caps shall be kept in their original container or in a closed metal box lined with a soft material such as wood or sponge rubber. The coils and folds in the wires of electric blasting caps should not be straightened out until made ready for use.

(Effective December 24, 1987)

Sec. 29-349-224. Extraneous electricity hazards

Blasting areas shall be surveyed for possible hazards caused by extraneous electricity.

Non electric initiation shall be used if a current testing device shows more than 0.06 ampere.

(Effective December 24, 1987)

Sec. 29-349-225. Drill hole size

All drill holes shall be sufficiently large to admit freely the insertion of the cartridges of explosives.

(Effective December 24, 1987)

Sec. 29-349-226. Tamping

Tamping shall be done only with wood rods without exposed metal joints, but non-sparking metal connectors may be used for jointed poles. Plastic tamping poles may be used, provided they have been approved by the State Fire Marshal. Violent tamping shall be avoided.

(Effective December 24, 1987)

Sec. 29-349-227. Loading of holes

No holes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives shall be immediately returned to an authorized magazine.

(Effective December 24, 1987)

Sec. 29-349-228. Examination for unexploded explosives

Drilling shall not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they shall be handled by or under the supervision of a competent and experienced person.

(Effective December 24, 1987)

Sec. 29-349-229. Deepening drill holes

No person shall deepen drill holes which have contained explosives.

(Effective December 24, 1987)

Sec. 29-349-230. Loading holes completed—return explosives to magazine

After loading for a blast is completed, all excess blasting caps or electric blasting caps and other explosives shall immediately be returned to their separate storage magazines.

(Effective December 24, 1987)

Sec. 29-349-231. Fuses. Length

Safety fuse shall be cut sufficiently long to extend beyond the collar of the hole, and sufficient in length to assure ample time in retiring from the blast, and shall be not less than three feet in length.

(Effective December 24, 1987)

Sec. 29-349-232. Fuses into cap

Safety fuse shall be cut squarely across and not at a slant. At least one inch of safety fuse shall be cut off, and the freshly cut end immediately inserted into the blasting cap and crimped with a standard crimper so that the safety fuse is seated against the detonating composition in the cap.

(Effective December 24, 1987)

Sec. 29-349-233. Cartridges

Cartridges for use in blasting shall be primed only as required for immediate use.

(Effective December 24, 1987)

Sec. 29-349-234. Leading wires

Rubber covered or equally insulated wires in good condition shall be used for leading wires. Permanent lines shall be properly supported and insulated and of sufficient size to provide theoretical current requirements for the maximum proposed blast allowing for the ultimate length of the firing line. The firing circuit should be kept completely insulated from the ground or other conductors such as bare wires, tails, pipes or other paths of stray currents.

(Effective December 24, 1987)

Sec. 29-349-235. Equipment of blaster

Each blaster shall be equipped with a galvanometer and blasting machine in good working order; and shall be further equipped with fuse cutters and cap crimpers if cap and fuse is used.

(Effective December 24, 1987)

Sec. 29-349-236. Short circuiting leading wires

Prior to firing shots electrically, the leading wires shall be kept short circuited until ready to actually fire the shot.

(Effective December 24, 1987)

Sec. 29-349-237. Testing of circuits

Blasters, when testing circuits to charge holes, shall use only blasting galvanometers designed for this purpose.

(Effective December 24, 1987)

Sec. 29-349-238. Loading and drilling restricted

No loading operation shall be conducted within 25 feet of a drilling operation.

(Effective December 24, 1987)

Sec. 29-349-239. Springing holes

Drill holes shall not be sprung unless they are more than 100 feet from the nearest hole

containing explosives. Holes that have been sprung shall not be charged with explosives until the maximum temperature in any portion of such hole has been reduced to less than 150°F. If an accurate method of measuring the temperature is not available, the hole shall not be reloaded for at least two hours. Sprung holes may be cooled by the addition of sufficient water.

(Effective December 24, 1987)

Sec. 29-349-240. Stemming

Stemming shall consist of clean fine clay, sand or crushed rock screenings. The use of leaves or trash is prohibited. Each blast hole shall be stemmed to the collar or to a point high enough to provide sufficient confinement of the charge and to minimize the chance of injury to personnel from flying material.

(Effective December 24, 1987)

Sec. 29-349-241. Misfire. Suspected

If a misfire is suspected, all wires or commercial detonating fuse in broken rock shall be carefully traced and search made for unexploded cartridges. If recovery is not made, the Local Fire Marshal shall be notified.

(Effective December 24, 1987)

Sec. 29-349-242. Misfire. Investigation

No person shall be permitted to examine a shot after a misfire until specifically authorized by the person in charge of the blasting operations. If practicable, the misfired charge shall be re-primed and fired. Misfires shall be handled only by or under the direction of a competent and experienced person.

(Effective December 24, 1987)

Sec. 29-349-243. Misfire. Precautions

If a misfire occurs or is suspected, no person shall return to the victinity of the misfire until at least one hour after the misfire if the shot was cap and fuse firing, or minimum of 30 minutes for electric firing. If there is reason to believe that the explosive is burning in the hole, no person shall return to the vicinity of the misfire for at least 12 hours, and the site shall be guarded in the interim.

(Effective December 24, 1987)

Sec. 29-349-244. Airline hose prohibited within twenty-five feet

In no case shall an airline hose be permitted to be located within 25 feet of a loading operation or a space where explosives are stored or handled.

(Effective December 24, 1987)

Sec. 29-349-245. Loaded holes to be guarded. Warning whistle

When a charge of explosives has been loaded there shall be a constant guard over same until the blast is fired. Before a blast is fired, a loud warning signal shall be given by the person in charge, who has made certain that all surplus explosives are in a safe place, all persons and vehicles are at a safe distance or under sufficient cover, and that an adequate warning has been given. Said guard shall remain until the person in charge is reasonably certain there have been no misfires.

(Effective December 24, 1987)

Sec. 29-349-246. Blasting caps in congested areas

Only electric blasting caps or commercial detonating fuse shall be used for blasting operations in congested districts, or on highways, or adjacent to highways open to traffic, except where sources of extraneous electricity make such use dangerous.

(Effective December 24, 1987)

Sec. 29-349-247. Cap crimpers

When fuse is used, the blasting cap shall be securely attached to the fuse with a standard ring type cap crimper. All primers shall be assembled at least 50 feet from any magazine.

(Effective December 24, 1987)

Sec. 29-349-248. Accidents, thefts, fires to be reported

All accidents, thefts or fires occurring with the use of explosives shall be reported to the Local Fire Marshal immediately by verbal communication and, within 24 hours, shall report in detail the chronological events pertaining to same, in writing, to the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-249. Inserting. Blasting caps

No blasting cap shall be inserted in the explosives without first making a hole in the cartridge for the cap with a wooden or non-ferrous metal punch of proper size or standard cap crimper.

(Effective December 24, 1987)

Sec. 29-349-250. Misfired explosives, not to be dug out

Explosives shall not be extracted from a hole that has once been charged or has misfired unless it is impossible to safely detonate the unexploded charge by insertion of a fresh additional primer.

(Effective December 24, 1987)

Sec. 29-349-251. Lead wire connector to fire shot

Only the man making leading wire connections in electric firing shall fire the shot. All connections should be made from bore hole back to the source of the firing current, and the

leading wires shall remain shorted and not be connected to the blasting machine or other source of current until the charge is to be fired.

(Effective December 24, 1987)

Sec. 29-349-252. Extraneous electricity. Precautions

Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, adjacent power lines, lightning, dust storms and other sources of extraneous electricity. The precautions shall include:

(a) The suspension of all blasting operations regardless of the method of initiation and removal of persons from the blasting area during the approach and progress of an electric storm.

(b) Special precautions may be required by the State Fire Marshal when blasting operations are conducted in a radar environment.

(c) Electric blasting shall not be carried out at lesser distances from radio transmitter antennas than is set forth in the following table:

Distances for AM Transmitters (Fixed or Mobile)

Transmitter Power in Watts	Minimum Distance in Feet
5 — 25	100
25 — 50	150
50 — 100	220
100 — 250	350
250 — 500	450
500 — 1,000	650
1,000 — 2,500	1,000
2,500 — 5,000	1,500
5,000 — 10,000	2,200
10,000 — 25,000	3,500
25,000 — 50,000	5,000
50,000 — 100,000	7,000

Distances for FM Mobile Transmitters

Transmitter Power in Watts	Minimum Distance in Feet
1 — 10	5
10 — 30	10
30 — 60	15
60 — 250	30
250 — 600	45

Where the power of an FM or TV transmitter exceeds 100,000 watts, electric blasting shall be conducted at a distance of at least 600 feet or more. No electric blasting will be carried out at lesser distances than in the aforesaid tables without the specific permission of the State Fire Marshal.

(Effective December 24, 1987)

CHAPTER VII. EXPLOSIVES AT PIERS, RAILWAY STATIONS AND CARS OR VESSELS NOT OTHERWISE SPECIFIED IN THESE REGULATIONS

Sec. 29-349-253. Railroad cars

Except in an emergency, and with the permission of the State Fire Marshal, no person shall have or keep explosives in a railway car unless said car and contents and methods of loading are in accordance with the U.S. Department of Transportation regulations for the transportation of explosives.

(Effective December 24, 1987)

Sec. 29-349-254. Packing to conform to D.O.T. regulations

No person shall deliver any explosives to any carrier unless such explosive conforms in all respects, including marking and packaging to the U.S. Department of Transportation regulations for the transportation of explosives.

(Effective December 24, 1987)

Sec. 29-349-255. Warning signs

Every railway car containing explosives which has reached its destination, or is stopped in transit so as no longer to be in interstate commerce shall have attached to both sides and ends of the car, cards with the words "EXPLOSIVES—HANDLE CAREFULLY—KEEP FIRE AWAY" in red letters at least one and one-half inches high in a white background.

(Effective December 24, 1987)

Sec. 29-349-256. Explosives to be isolated at terminals

Any explosives at a railway facility, truck terminal, pier, wharf, harbor facility or airport terminal whether for delivery to a consignee or forwarded to some other destination shall be kept in a safe place, isolated as far as is practicable and in such manner that they can be easily and quickly removed.

(Effective December 24, 1987)

Sec. 29-349-257. Delivery between sunset and sunrise

Explosives shall not be delivered to or received from any railway station, truck terminal, pier, wharf, harbor facility or airport terminal between the hours of sunset and sunrise without notifying the Local Fire Marshal, who shall take appropriate steps to assure the

safety of the public.

(Effective December 24, 1987)

Sec. 29-349-258. Unclaimed or undelivered explosives

Whenever explosives brought into this State by any means of transportation for delivery to an intermediate receiver, consignee's agent or consignee, or to be forwarded to some other destination, shall remain unclaimed or undelivered for 48 hours (Sundays and holidays excluded) such shipper shall notify the Local Fire Marshal. The Local Fire Marshal shall then order the transportation company to move said explosives to an approved storage magazine or place of safety and the cost of such movement shall be borne by the shipper of the explosives.

(Effective December 24, 1987)

Sec. 29-349-259. Consignee to remove explosives

Any person having been notified, as consignee, of a shipment of explosives being in the hands of any carrier shall remove the said explosives within 48 hours, Sundays and holidays excluded, after receiving such notification, to a place meeting the requirements of these regulations.

(Effective December 24, 1987)

Sec. 29-349-260. Authority to designate location and quantity of explosives

The Local Fire Marshal has the authority to and may designate the location for, and limit the quantity of, explosives which may be loaded, unloaded, reloaded, or temporarily retained at any facility within his jurisdiction.

(Effective December 24, 1987)

Sec. 29-349-261. Permits for waterfront facilities

Before the owner or operator of a waterfront facility shall handle, load, discharge, transport on or over such facility any Class A explosive in any quantity, he shall hold a permit issued by the Local Fire Marshal. The owner or operator of a waterfront facility shall notify the Fire Marshal when the quantity of Class B explosives present on the facility is in excess of one ton. No permit shall be issued by the Local Fire Marshal for the loading or discharging to or from any vessel any explosives unless such explosives are marked, labeled and packaged in accordance with D.O.T. regulations and meet the regulations of the United States Coast Guard. Such Fire Marshal shall specify the limits as to maximim quantity, isolation and remoteness. Nothing herein contained shall be deemed to limit or restrict the shipment, transportation or handling of military explosives by or for the Armed Forces of the United States.

(Effective December 24, 1987)

CHAPTER VIII. BLASTING AGENTS

Sec. 29-349-262. Application of regulations

Unless otherwise set forth in these regulations, blasting agents shall be transported, stored and used in the same manner as explosives.

(Effective December 24, 1987)

Sec. 29-349-263. Facilities used for mixing blasting agents

(a) Buildings or other facilities used for mixing blasting agents shall be located, with respect to inhabited buildings, passenger railroads and public highways, in accordance with the American Table of Distances.

(b) Any ammonium nitrate stored at a closer distance to the blasting agent storage area than as provided in (c) below shall be added to the quantity of blasting agents to calculate the total quantity involved for application of the aforementioned Table.

(c) Minimum intra-plant separation distances between mixing units and the ammonium nitrate storage areas and blasting agent storage areas shall be in conformity with the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents.

(Effective December 24, 1987)

Sec. 29-349-264. Buildings used for mixing of blasting agents

(a) Buildings used for the mixing of blasting agents shall conform to the requirements of this section, unless otherwise specifically approved by the State Fire Marshal.

(b) Buildings shall be of noncombustible construction or sheet metal on wood studs.

(c) The layout of the mixing building shall be such as to provide physical separation between the finished product storage, and the mixing and packaging operation.

(d) Floors in the storage areas and in the processing plant shall be of concrete, metal or other approved material. Isolated fuel storage shall be provided to avoid contact between molten ammonium nitrate and fuel in case of fire.

(e) The building shall be well ventilated.

(f) Heat shall be provided exclusively from a source outside the building. However, space heaters that do not depend on combustion processes within the heating unit may be satisfactory if they are located overhead to provide a minimum clearance of 30 inches from raw materials and finished products. The space heaters must also meet the requirements of the most recent edition of the National Electrical Code for the specific type of hazard encountered.

(Effective December 24, 1987)

Sec. 29-349-265. Mixer design

The design of the mixer shall be such as to minimize the possibility of frictional heating, compaction, and especially confinement. Open mixers are preferable to enclosed mixers.

Bearing and gears should be protected against the accumulation of ammonium nitrate dust. All surfaces should be accessible for cleaning. Mixing and packaging equipment shall be constructed of materials compatible with fuel-ammonium nitrate composition.

(Effective December 24, 1987)

Sec. 29-349-266. Determination of blasting agent compositions

The provisions of this section shall be considered when determining blasting agent compositions. The sensitivity of the blasting agent shall be determined by means of a No. 8 test blasting cap at regular intervals and after every change in formulation or as may be required by the State Fire Marshal.

(a) Oxidizers of small particle size such as crushed prills or fines may be more sensitive and hazardous than the ordinary prills and shall be handled with greater care.

(b) No liquid fuel with flash point lower than that of No. 2 diesel fuel oil (125°F. minimum or legal) shall be used.

(c) Crude oil and crankcase oil shall not be used because they may contain light ends that offer increased vapor-explosion hazards or gritty particles that tend to sensitize the resulting blasting agent.

(d) If solid fuels are used, they shall be chosen so as to minimize dust-explosion hazard.

(e) Metal dust (aluminum powder, etc.) peroxides, chlorates, or perchlorates shall not be used unless such operations are conducted in a manner approved by the State Fire Marshal.

(f) Unusual compositions shall not be attempted except under the supervision of competent personnel equipped to determine the over-all hazard of the resulting compositions.

(g) Suitable means shall be provided to prevent the flow of fuel oil to the mixer in case of fire. In gravity flow systems an automatic spring-loaded shutoff valve with fusible link shall be installed.

(Effective December 24, 1987)

Sec. 29-349-267. Power sources for mixing plants

(a) All electrical switches, controls, motors, and lights, if located in the mixing rooms shall conform to the requirements of Class II, Division 2 of the National Electrical Code; otherwise they should be located outside the mixing room. The frame of the mixer and all other equipment that may be used shall be electrically bonded and provided with a continuous path to the ground.

(b) All internal-combustion engines used for electric power generation shall be located outside the mixing plant building, or shall be properly ventilated and isolated by a fire wall. The exhaust systems on all such engines shall be located so any spark emission can not be a hazard to any materials in or adjacent to the plant.

(Effective December 24, 1987)

Sec. 29-349-268. Washdown facilities

An automatic water-deluge system with adequate capacity shall be provided to protect mixers and the finished-explosives storage area in permanently located plants. Floors shall be constructed so as to eliminate open floor drains and piping into which molten materials could flow and be confined in case of fire. The floors and equipment of the mixing and packaging room shall be washed down frequently to prevent accumulation of oxidizers or fuels and other sensitizers. The entire mixing and packaging plant shall be washed down periodically to prevent excessive accumulation of dust.

(Effective December 24, 1987)

Sec. 29-349-269. Smoking prohibited

Smoking or open flames shall not be permitted in or within 50 feet of any building or facility used for the mixing of blasting agents.

(Effective December 24, 1987)

Sec. 29-349-270. Disposal of nitrate bags

Empty ammonium nitrate bags shall be disposed of daily by burning in small quantities in a safe location. No person shall remain within 100 feet once the burning has started.

(Effective December 24, 1987)

Sec. 29-349-271. Limited production

Not more than one day's production of blasting agents or the limit determined by the American Table of Distances, whichever is less, shall be permitted in or near the mixing and packaging plant or area. Larger quantities shall be stored in separate warehouses or magazines.

(Effective December 24, 1987)

Sec. 29-349-272. Storage of blasting agents and supplies

Blasting agents, ammonium nitrate and all oxidizers used for mixing of blasting agents shall be stored in the manner set forth in this section.

(a) Blasting agents or ammonium nitrate, when stored in conjunction with explosives shall be stored in conformity with the Table of Distances Chart, Chapter IX of this Code. The mass of blasting agents and one-half the mass of ammonium nitrate shall be included when computing the total quantity of explosives for determining distance requirements.

(b) Blasting agents when stored entirely separate may be stored in the manner set forth for Class A explosives or in one-story warehouses (without basements) which shall be:

1. Noncombustible or fire-resistive;
2. Constructed so as to eliminate open floor drains and piping into which molten materials could flow and be confined in case of fire;
3. Weather resistant;
4. Well ventilated; and

5. Equipped with a strong door kept securely locked, in the same manner as explosives magazines, except when open for business under supervision.

(c) Semitrailer or full trailer vans used for highway or on-site transportation of the blasting agents are satisfactory for temporary storing of these materials, provided they are located according to the American Table of Distances with respect to inhabited buildings, passenger railroads and public highways and according to the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents with respect to one another. Trailers shall be provided with substantial means for locking and the trailer doors shall be kept locked, except during the time of placement and removal of stocks and blasting agents.

(Effective December 24, 1987)

Sec. 29-349-273. Blasting agents stored in warehouses

Warehouses used for the storage of blasting agents separate from explosives shall be located as set forth in this section:

(a) Warehouses used for the storage of blasting agents shall be located in accordance with the provisions of the American Table of Distances with respect to inhabited buildings, passenger railroads, public highways and according to the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents with respect to one another.

(b) If both blasting agents and ammonium nitrate are handled or stored within the distance limitations prescribed in the Table of Distance chart of this Code, one-half the mass of ammonium nitrate shall be added to the mass of the blasting agent when computing the total quantity of explosives for determining the proper distance for compliance with the American Table of Distances.

(Effective December 24, 1987)

Sec. 29-349-274. Smoking, firearms, etc. prohibited locations

Smoking, matches, open flames, spark producing devices and firearms shall be prohibited inside of or within 50 feet of any mixing and packaging plant or area or any warehouse used for the storage of blasting agents. Combustible materials, shall not be stored within 50 feet of mixing plants of warehouses used for the storage of blasting agents and the land surrounding such places shall be maintained clear of dried grass, leaves and brush for this distance.

(Effective December 24, 1987)

Sec. 29-349-275. Warehouse housekeeping

The interior of warehouses used for the storage of blasting agents shall be kept clean and free from debris and empty containers. Spilled materials shall be cleaned up promptly and safely removed. Combustible materials, flammable liquids, corrosive acids shall not be stored in any warehouse used for blasting agents unless separated therefrom by a fire-

resistive separation of not less than one hour resistance. The provisions of this section shall not prohibit the storage of blasting agents with non-explosive blasting supplies.

(Effective December 24, 1987)

Sec. 29-349-276. Fuels to be separated

Piles of ammonium nitrate and warehouses containing ammonium nitrate shall be adequately separated from readily combustible fuels.

(Effective December 24, 1987)

Sec. 29-349-277. Loosening materials by blasting prohibited

Caked ammonium nitrates either in bags or in bulk, shall not be loosened by blasting.

(Effective December 24, 1987)

Sec. 29-349-278. Warehouses to be supervised by competent person

Every warehouse used for the storage of blasting agents shall be under the supervision of a competent person who shall be not less than 21 years of age.

(Effective December 24, 1987)

Sec. 29-349-279. Authority to designate location and quantity of blasting agents

The State Fire Marshal has the authority to and may designate the location for, and limit the quantity of blasting agents which may be loaded, unloaded, reloaded or temporarily retained at any facility within the state.

(Effective December 24, 1987)

Sec. 29-349-280. Transportation of blasting agents

When blasting agents are transported all of the requirements of these regulations concerning the transportation of explosives shall be complied with, and vehicles involved shall be placarded and marked in the same manner as explosives vehicles.

(Effective December 24, 1987)

Sec. 29-349-281. Operators of vehicles transporting blasting agents

Vehicles transporting blasting agents shall only be driven by and be in charge of a licensed driver who is physically fit, careful, capable, reliable, able to read and write the English language proficiently, and not addicted to the use, or under the influence of intoxicants, narcotics, or drugs, and not less than 21 years of age. He shall be familiar with the traffic regulations, state laws, and the provisions of these regulations.

(Effective December 24, 1987)

Sec. 29-349-282. Certain substances prohibited

No sparking metal, sparking metal tools, oils, matches, firearms, spark producing devices, acids or other corrosive liquids shall be carried in the bed or body of any vehicles containing

blasting agents.

(Effective December 24, 1987)

Sec. 29-349-283. Use of intoxicating liquor prohibited

No person shall be permitted to ride upon, drive, load or unload a vehicle containing blasting agents while smoking or under the influence of intoxicants or drugs.

(Effective December 24, 1987)

Sec. 29-349-284. Transportation on public vehicles prohibited

It is prohibited for any person to transport or carry any blasting agents upon any public vehicle carrying passengers for hire.

(Effective December 24, 1987)

Sec. 29-349-285. Condition of vehicle

Vehicles transporting blasting agents shall be in safe operating condition at all times.

(Effective December 24, 1987)

Sec. 29-349-286. Packaging and marking of containers

When offering blasting agents for transportation on public highways, the packaging, marking and labeling of containers of blasting agents shall comply with the requirements of the U.S. Department of Transportation.

(a) Vehicles used for transporting blasting agents on public highways shall be placarded in accordance with the U.S. Department of Transportation regulations.

(Effective December 24, 1987)

Sec. 29-349-287. Bulk delivery and mixing vehicle of blasting agents

Regulations of the section shall apply to off-highway private operation as well as to all public highway transportation.

(a) A bulk vehicle body shall be constructed of noncombustible materials.

(b) Vehicles used to transport bulk pre-mixed blasting agents on public highway shall have closed bodies.

(c) All moving parts of the mixing system shall be designed as to prevent a heat build up. Shafts or axles which contact the product shall have outboard bearing with 1-inch minimum clearance between the bearing and outside of the product container. Particular attention shall be given to the clearance on all moving parts.

(d) A bulk delivery vehicle shall be strong enough to carry the load without difficulty and be in good mechanical condition.

(e) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying and related equipment, and also be familiar with commodities being delivered and procedure used in emergency situations.

(f) Caution shall be exercised in the movement of the vehicle in the blasting area to avoid

driving the vehicle over or dragging hoses over firing lines, cap wires, or explosive materials. The employer shall provide a second person to guide his movements.

(g) No intransit mixing of materials shall be performed.

(h) No repairs to bulk delivery or mixing vehicles shall be made unless it has been completely washed down and all oxidizer material removed.

(i) When electric power is supplied by a self-contained motor generator located on the vehicle the generator shall be at a point separate from where the blasting agent is discharged.

(j) The location chosen for the blasting agent transfer from a support vehicle into the borehole loading vehicle shall be away from the blast hole site when the boreholes are loaded or in the process of being loaded.

(k) A positive action parking brake will set the wheel brakes on at least one axle shall be provided on vehicles when equipped with air brakes and shall be used during bulk delivery operations. Wheel chocks shall supplement parking brakes.

(Effective December 24, 1987)

Sec. 29-349-288. Use of blasting agents

Persons using blasting agents shall comply with all the applicable provisions of these regulations concerning the use of explosives and as set forth in this section.

(a) Pneumatic loading from bulk delivery vehicles into boreholes primed with electric blasting caps or other static-sensitive systems shall meet the following requirements:

(1) A positive grounding device shall be used to prevent accumulation of static electricity.

(2) A discharge hose shall be used that has a resistance range that will prevent conducting stray currents, but that is conductive enough to bleed off static buildup.

(Effective December 24, 1987)

CHAPTER IX. STORAGE OF AMMONIUM NITRATE

Sec. 29-349-289. General application

These regulations apply to the storage of ammonium nitrate in the form of crystals, flakes, grains or prills including fertilizer grade, dynamite grade, nitrous oxide grade, technical grade and other mixtures containing 60 per cent or more ammonium nitrate by weight, but does not apply to blasting agents.

(Effective December 24, 1987)

Sec. 29-349-290. Prohibited storage

The storage of ammonium nitrate that does not meet the specifications of fertilizer grade ammonium nitrate as set forth by the State Fire Marshal shall not be permitted by these regulations except on the specific approval of said marshal.

(Effective December 24, 1987)

Sec. 29-349-291. Regulations application

These regulations shall apply to all persons, firms, corporations, co-partnerships and associations storing, having or keeping ammonium nitrate, and to the owner or lessee of any building, premises or structure in which ammonium nitrate is stored in quantities of 1,000 pounds or more.

(Effective December 24, 1987)

Sec. 29-349-292. Maximum storage

Not more than 60 tons of ammonium nitrate shall be stored unless the location and storage facility have been approved.

(Effective December 24, 1987)

Sec. 29-349-293. Approval of storage locations

Storage locations shall be subject to the approval by the State Fire Marshal with respect to nearness of residential occupancies, places of public assembly, schools, hospitals, railroads and public highways. Limitations on storable quantities shall be considered with regard to proximity of these exposures and congested commercial or industrial districts.

(Effective December 24, 1987)

Sec. 29-349-294. Approval of large quantity storage

Approval of large quantity storage shall be subject to due consideration of possible toxic vapors from burning or decomposing ammonium nitrate.

(Effective December 24, 1987)

Sec. 29-349-295. Storage building requirements

Storage buildings shall not be over one story in height or have basements, unless approved for such use, and shall be equipped with lightning rod protection.

(Effective December 24, 1987)

Sec. 29-349-296. Ventilation

Storage buildings shall have adequate ventilation or be of a construction that will be self-ventilating in the event of fire.

(Effective December 24, 1987)

Sec. 29-349-297. Walls exposed to combustible buildings. Protection

The wall on the exposed side of a storage building within 50 feet of a combustible building, forest, piles of combustible material and similar exposure hazards shall be of fire resistive or noncombustible construction. In lieu of the fire-resistive or noncombustible wall, other better means of exposure protection such as outside automatic sprinklers or free standing walls may be used. The roof coverings shall be Class C or better, as defined in

Roof Coverings, NFPA No. 203.

(Effective December 24, 1987)

Sec. 29-349-298. Floor construction

All flooring in storage and handling areas shall be of noncombustible material or protected against impregnation by ammonium nitrate and shall be without open drains, traps, tunnels, pits, or pockets into which any molten ammonium nitrate could flow and be confined in the event of fire.

(Effective December 24, 1987)

Sec. 29-349-299. Existing storage buildings

The continued use of an existing storage building or structure not in strict conformity with these regulations may be approved in cases where such continued use will not constitute a hazard to life or adjoining property.

(Effective December 24, 1987)

Sec. 29-349-300. Buildings to be dry

Buildings and structures shall be dry free from water seepage through the roof, walls and floors.

(Effective December 24, 1987)

Sec. 29-349-301. Bags and container requirements

Bags and containers used for ammonium nitrate must comply with specifications and standards required for use in interstate commerce.

(Effective December 24, 1987)

Sec. 29-349-302. Containers requirement exemption

Containers used on the premise in the actual manufacturing or processing need not comply with provisions of Section 29-349-301.

(Effective December 24, 1987)

Sec. 29-349-303. Maximum temperature for storage

Containers of ammonium nitrate shall not be accepted for storage when the temperature of the ammonium nitrate exceeds 130°F.

(Effective December 24, 1987)

Sec. 29-349-304. Ammonium nitrate storage height limitation

Bags of ammonium nitrate shall not be stored within 30 inches of the storage building walls and partitions.

(Effective December 24, 1987)

Sec. 29-349-305. Pile storage requirements

The height of piles shall not exceed 20 feet. The width of piles shall not exceed 20 feet and the length 50 feet except that where the building is of noncombustible construction or is protected by automatic sprinklers the length of piles shall not be limited. In no case shall the ammonium nitrate be stacked closer than 36 inches below the roof or supporting and spreader beams overhead.

(Effective December 24, 1987)

Sec. 29-349-306. Width of aisles

Aisles shall be provided to separate piles by a clear space of not less than 3 feet in width. At least one service or main aisle in the storage shall be not less than 4 feet in width.

(Effective December 24, 1987)

Sec. 29-349-307. Waiver for pile sizes

The requirements for pile sizes and aisles, as set forth in Sections 29-349-305 and 29-349-306 may be waived by the State Fire Marshal where storage facilities are located in remote areas.

(Effective December 24, 1987)

Sec. 29-349-308. Bulk storage by specific approval

Bulk storage of ammonium nitrate shall be permitted only after specific approval by the Local or State Fire Marshal, who shall give due consideration to the location in regard to heavily populated and built up centers.

(Effective December 24, 1987)

Sec. 29-349-309. Permissible bulk storage

Bulk storage may be in covered open piles, in bins, in warehouses, or in silo-type structures and shall totally exclude all other commodities of an organic, combustible or oxidizable nature.

(Effective December 24, 1987)

Sec. 29-349-310. Warehouse ventilation. Combustible construction

Warehouses, if of combustible construction, shall have adequate ventilation or be capable of adequate ventilation in case of fire.

(Effective December 24, 1987)

Sec. 29-349-311. Maximum height requirements

Unless constructed of noncombustible material, bulk storage structures shall not exceed a height of 40 feet.

(Effective December 24, 1987)

Sec. 29-349-312. Bin contamination

Bins shall be clear and free of materials which may contaminate ammonium nitrate.

(Effective December 24, 1987)

Sec. 29-349-313. Prohibited bin construction materials

Due to corrosive and reactive properties of ammonium nitrate, and to avoid contamination, steel, galvanized iron, copper, lead and zinc shall not be used in bin construction unless suitably protected.

(Effective December 24, 1987)

Sec. 29-349-314. Warehouse subdivision

The warehouse may be subdivided by tight partition walls into any desired number of ammonium nitrate storage compartments or bins.

(Effective December 24, 1987)

Sec. 29-349-315. Identification signs

The ammonium nitrate storage bins or piles shall be clearly identified by signs reading "AMMONIUM NITRATE" with letters at least 2 inches high.

(Effective December 24, 1987)

Sec. 29-349-316. Periodic moving of material

Piles or bins shall be so sized and arranged that all material in the pile is moved out periodically in order to minimize possible caking of the stored ammonium nitrate.

(Effective December 24, 1987)

Sec. 29-349-317. Limitations of depth of piles

Height or depth of piles shall be limited by the pressure setting tendency of the product. However, in no case shall the ammonium nitrate be piled higher at any point than 36 inches below the roof or supporting and spreader beams overhead.

(Effective December 24, 1987)

Sec. 29-349-318. Maximum temperature for storage

Ammonium nitrate shall not be accepted for storage when the temperature of the product exceeds 130°F.

(Effective December 24, 1987)

Sec. 29-349-319. Use of explosives prohibited for loosening

Dynamite, other explosives, and blasting agents shall not be used to break up or loosen caked ammonium nitrate.

(Effective December 24, 1987)

Sec. 29-349-320. Wall construction requirements for separation

Ammonium nitrate shall be separated by approved type walls of not less than one hour fire-resistance rating from storage or organic chemicals, acids or corrosive liquids, or other contaminating substances including but not limited to animal fats, baled cotton, baled rags, baled scrap paper, bleaching powder, burlap or cotton bags, caustic soda, coal, coke, charcoal, cork, camphor, excelsior, fibers of any kind, fish oils, fish meal, foam rubber, hay, lubricating oil, linseed oil, or other oxidizable or drying oils, napthalene, oakum, oiled clothing, oiled paper, oiled textiles, paint, straw, sawdust, wood shavings, or vegetable oils. Walls referred to in this section need extend only to the underside of the roof.

(Effective December 24, 1987)

Sec. 29-349-321. Separation requirements with outwalls

In lieu of separation walls, ammonium nitrate may be separated from the materials referred to in the foregoing section by a space at least 30 feet or more as required by the Local or State Fire Marshal, and if necessary, sill or curbs shall be provided to prevent mixing during fire conditions.

(Effective December 24, 1987)

Sec. 29-349-322. Flammable liquid storage prohibited

Flammable liquids such as gasoline, kerosene, solvents and light fuel oils shall not be stored on the premises except as approved by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-323. LP-Gas storage prohibited

LP-Gas shall not be stored on the premises except as approved by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-324. Other materials storage restricted

Sulphur and finely-divided metals shall not be stored in the same building with ammonium nitrate except as approved by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-325. Prohibited storage of explosives and blasting agents

(a) Explosives and blasting agents shall not be stored in the same building with ammonium nitrate except on the premises of makers, distributors and user-compounders of explosives or blasting agents.

(b) When explosives or blasting agents are stored in separate buildings, other than on the premises of makers, distributors, and user-compounders of explosives, or blasting agents, they shall be separated from the ammonium nitrate by the distances and/or barricades specified in the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents, but by not less than 50 feet.

(c) Storage and/or operations on the premises of makers, distributors and user-compounders of explosives or blasting agents shall be in conformity with this Code.

(Effective December 24, 1987)

Sec. 29-349-326. Electrical installations

Electrical installations shall conform to the requirements of the National Electric Code. They shall be designed to minimize damage from corrosion.

(Effective December 24, 1987)

Sec. 29-349-327. Electric light protection

Electric lamps shall be located or guarded so as to preclude contact with bags or other combustible materials.

(Effective December 24, 1987)

Sec. 29-349-328. Housekeeping

Good housekeeping shall be maintained.

(Effective December 24, 1987)

Sec. 29-349-329. Broken bag content salvage

Uncontaminated contents of broken bags may be salvaged by placing the damaged bag inside a clean, new slip-over bag and closing securely. Other spilled materials and discarded containers shall be promptly gathered and disposed of in a safe manner.

(Effective December 24, 1987)

Sec. 29-349-330. Open lights or flames and smoking prohibited

Open lights or flames and smoking shall be prohibited in storage buildings, but this is not meant to exclude heating units approved by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-331. Entrances to warehouses to be properly identified

All points of entry to commercial warehouses in which ammonium nitrate is stored shall be properly identified with durable signs meeting the following specifications:

(a) Signs shall have background and letters in contrasting colors.

(b) Signs shall be worded "AMMONIUM NITRATE," with letters at least 2 inches high.

(Effective December 24, 1987)

Sec. 29-349-332. Vehicle parking in buildings restricted

Internal combustion motor vehicles, lift trucks and cargo conveyors shall not be permitted to remain overnight in a building where ammonium nitrate is stored unless parked in an area approved exclusively for such parking purposes.

(Effective December 24, 1987)

Sec. 29-349-333. Trucks inside warehouses to conform to requirements

Fork trucks, tractors, platform lift trucks, and other specialized industrial trucks used within the warehouse shall conform to the requirements of the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-334. Lightning protection

In areas where lightning storms are prevalent, lightning protection shall be provided. See the Lightning Protection Code, NFPA No. 78.

(Effective December 24, 1987)

Sec. 29-349-335. Unauthorized personnel

Provisions shall be made to prevent unauthorized personnel from entering the ammonium nitrate storage area.

(Effective December 24, 1987)

Sec. 29-349-336. Automatic sprinkler requirements

Unless the storage of a greater quantity is approved by the State Fire Marshal, not more than 2,500 tons of bagged ammonium nitrate shall be stored in a building or structure not equipped with an automatic sprinkler system suitable for high hazard occupancies. When determining whether greater quantities shall be permitted without sprinkler protection, the State Fire Marshal shall take into consideration proximity of the storage building to built-up areas, possible presence of contaminates in the storage building, and the availability of water supplies. Sprinkler protection may be required for the storage of less than 2,500 tons of ammonium nitrate where location of the building or the presence of other stored materials may present a special hazard.

(Effective December 24, 1987)

Sec. 29-349-337. Automatic sprinkler installation

Sprinkler systems shall be approved type and installed in accordance with the requirements of the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-338. Portable fire extinguishers

Suitable fire control devices such as small hose or portable extinguishers shall be provided throughout the warehouse and in the loading and unloading areas as required by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-339. Fire hydrants

Water supplies and fire hydrants shall be available in accordance with recognized good

practices and as required by the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-340. Sprinklers, hydrants may be waived

The requirements for automatic sprinklers, water supplies and fire hydrants set forth in this Code may be waived by the State Fire Marshal when storage facilities are located in remote areas.

Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents (Notes 1, 6)**

Donor Weight		Minimum Separation Distance of Receptor When Barricaded (Note 2) (Feet)		Minimum Thickness of Artificial Barricades (Note 5) (Inches)
Pounds over	Pounds not over	Ammonium Nitrate	Blasting Agent	
	100	3	11	12
100	300	4	14	12
300	600	5	18	12
600	1,000	6	22	12
1,000	1,600	7	25	12
1,600	2,000	8	29	12
2,000	3,000	9	32	15
3,000	4,000	10	36	15
4,000	6,000	11	40	15
6,000	8,000	12	43	20
8,000	10,000	13	47	20
10,000	12,000	14	50	20
12,000	16,000	15	54	25
16,000	20,000	16	58	25
20,000	25,000	18	65	25
25,000	30,000	19	68	30
30,000	35,000	20	72	30
35,000	40,000	21	76	30
40,000	45,000	22	79	35

45,000	50,000	23	83	35
50,000	55,000	24	86	35
55,000	60,000	25	90	35
60,000	70,000	26	94	40
70,000	80,000	28	101	40
80,000	90,000	30	108	40
90,000	100,000	32	115	40
100,000	120,000	34	122	50
120,000	140,000	37	133	50
140,000	160,000	40	144	50
160,000	180,000	44	158	50
180,000	200,000	48	173	50
200,000	220,000	52	187	60
220,000	250,000	56	202	60
250,000	275,000	60	216	60
275,000	300,000	64	230	60

** *This Table appears in Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents, adopted as an NFPA Tentative Standard (No. 492-T) in 1967. For a discussion of the derivation of the Table and examples of how it is applied to actual storage situations, see No. 492-T.*

NFPA 495 46 NOTE A46 New reference replaced reference to tentative recommendations in Information Circular 7988. New is as follows: "Safety Recommendation for Sensitized Ammonium Nitrate Blasting Agents," Bureau of Mines, U.S. Department of Interior, Information Circular 8179, 1963.

NOTES TO TABLE OF RECOMMENDED SEPARATION AMMONIUM NITRATE AND BLASTING AGENTS FROM EXPLOSIVES OR BLASTING AGENTS

Note 1 — Recommended separation distances to prevent explosion of ammonium nitrate and ammonium nitrate based blasting agents by propagation from nearby stores of high explosive or blasting agents referred to in the Table as the "donor." Ammonium nitrate, by itself, is not considered to be a donor when applying this Table. If stores of ammonium nitrate are located within the sympathetic detonation distance of explosives or blasting agents, one-half the mass of the ammonium nitrate should be included in the mass of the donor. These distances allow for the possibility of high velocity metal fragments from mixers, hoppers, truck bodies, sheet metal structures, metal containers, and the like, which may enclose the "donor." These distances apply to the separation of stores only. The American Table of Distances shall be used in determining separation distances from inhabited buildings, passenger railways, and public highways.

Note 2 — When the ammonium nitrate and/or blasting agent is not barricaded, the distances shown in the Table shall be multiplied by six. Where storage is in bullet-resistant magazines recommended for explosives, or where the storage is protected by a bullet resistant wall, distances and barricade thickness in excess of those prescribed in the American Table of Distances are not required.

Note 3 — The distances in the Table apply to ammonium nitrate that passes the insensitivity test prescribed in the National Plant Food Institute;** and ammonium nitrate failing to pass said test shall be stored at separation distances determined by competent persons and approved by the State Fire Marshal's Office.

Note 4 — These distances apply to nitro-carbo-nitrates and blasting agents which pass the insensitivity test prescribed in the DOT regulations.

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* For construction of bullet-resistant magazines, see Chapter 3, NFPA 1967–68.

** Definition and Test Procedures of Ammonium Nitrate Fertilizer, National Plant Food Institute, November 1964.

Note 5 — Earth or sand dikes or enclosures filled with the prescribed minimum thickness of earth or sand are acceptable artificial barricades. Natural barricades, such as hills or timber of sufficient density that the surroundings exposures which require protection cannot be seen from the "donor" when the trees are bare of leaves, are also acceptable.

Note 6 — When the ammonium nitrate must be counted in determining the distances to be maintained from inhabited buildings, passenger railways and public highways, it may be counted at one-half its actual weight.

(Effective December 24, 1987)

CHAPTER X. PROTECTION OF STORED EXPLOSIVES

Sec. 29-349-341. American Table of Distances

The following is the American Table of Distances for Storage of Explosives.

American Table of Distances for Storage of Explosives

Explosives		*Distance in Feet When Storage is Barricaded*			
Pounds over	*Pounds not over*	*Inhabited buildings*	*Passenger railways*	*Public highways*	*Separation of magazines*
2	5	70	30	30	6
5	10	90	30	30	8
10	20	110	45	45	10
20	30	125	50	50	11
30	40	140	55	55	12
40	50	150	60	60	14
50	75	170	70	70	15

75	100	190	75	75	16
100	125	200	80	80	18
125	150	215	85	85	19
150	200	235	95	95	21
200	250	255	105	105	23
250	300	270	110	110	24
300	400	295	120	120	27
400	500	320	130	130	29
500	600	340	135	135	31
600	700	355	145	145	32
700	800	375	150	150	33
800	900	390	155	155	35
900	1,000	400	160	160	36
1,000	1,200	425	170	165	39
1,200	1,400	450	180	170	41
1,400	1,600	470	190	175	43
1,600	1,800	490	195	180	44
1,800	2,000	505	205	185	45
2,000	2,500	545	220	190	49
2,500	3,000	580	235	195	52
3,000	4,000	635	255	210	58
4,000	5,000	685	275	225	61
5,000	6,000	730	295	235	65
6,000	7,000	770	310	245	68
7,000	8,000	800	320	250	72
8,000	9,000	835	335	255	75
9,000	10,000	865	345	260	78
10,000	12,000	875	370	270	82
12,000	14,000	885	390	275	87
14,000	16,000	900	405	280	90
16,000	18,000	940	420	285	94
18,000	20,000	975	435	290	98
20,000	25,000	1,055	470	315	105
25,000	30,000	1,130	500	340	112

30,000	35,000	1,205	525	360	119
35,000	40,000	1,275	550	380	124
40,000	45,000	1,340	570	400	129
45,000	50,000	1,400	590	420	135
50,000	55,000	1,460	610	440	140
55,000	60,000	1,515	630	455	145
60,000	65,000	1,565	645	470	150
65,000	70,000	1,610	660	485	155
70,000	75,000	1,655	675	500	160
75,000	80,000	1,695	690	510	165
80,000	85,000	1,730	705	520	170
85,000	90,000	1,760	720	530	175
90,000	95,000	1,790	730	540	180
95,000	100,000	1,815	745	545	185
100,000	110,000	1,835	770	550	195
110,000	120,000	1,855	790	555	205
120,000	130,000	1,875	810	560	215
130,000	140,000	1,890	835	565	225
140,000	150,000	1,900	850	570	235
150,000	160,000	1,935	870	580	245
160,000	170,000	1,965	890	590	255
170,000	180,000	1,990	905	600	265
180,000	190,000	2,010	920	605	275
190,000	200,000	2,030	935	610	285
200,000	210,000	2,055	955	620	295
210,000	230,000	2,100	980	635	315
230,000	250,000	2,155	1,010	650	335
250,000	275,000	2,215	1,040	670	360
275,000	300,000	2,275	1,075	690	385

(Effective December 24, 1987)

Sec. 29-349-342. Existing Class B magazines

Magazines constructed and licensed prior to September 1, 1964 and used exclusively for the storage of Class B explosives may be located at one-half the distance specified in the

table.

(Effective December 24, 1987)

Sec. 29-349-343. Non-barricaded magazines

When a building containing explosives is not barricaded, the distance shown in the table shall be doubled.

(Effective December 24, 1987)

Sec. 29-349-344. Requirements for two or more magazines on same property

When two or more storage magazines are located on the same property, each magazine must comply with the minimum distances specified from inhabited buildings, railways and highways, and in addition, they should be separated from each other by not less than the distances shown for "Separation of Magazines" except that the quantity of explosives contained in cap magazines shall govern in regard to the spacing of said cap magazine from magazines containing other explosives. If any two or more magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more magazines, as a group must be considered as one magazine, and the total quantity of explosives stored in each group must be treated as if stored in a single magazine located on the site of any magazine of the group, and must comply with the minimum distances specified from other magazines, inhabited buildings, railways and highways.

(Effective December 24, 1987)

Sec. 29-349-345. Storage of explosives exceeding 300,000 pounds

The permanent storage of more than 300,000 pounds of commercial explosives in one magazine or in a group of magazines which is considered as one magazine is not permitted except by the specific approval of the State Fire Marshal.

(Effective December 24, 1987)

Sec. 29-349-346. Explosive rating of blasting caps

All types of blasting caps in strength through No. 8 shall be rated at 1½ pounds of explosives per 1,000 caps. The State Fire Marshal shall designate the ratings of caps higher in strength than No. 8.

(Effective December 24, 1987)

CHAPTER XI. WATER GELS OR SLURRY EXPLOSIVES**

**** Chapter 9, NFPA 1968-68**

Sec. 29-349-347. General provisions

Unless otherwise set forth in this chapter, water gels shall be transported, stored and used in the same manner as explosives or blasting agents in accordance with the classification

of the product.

(Effective December 24, 1987)

Sec. 29-349-348. Premixed water gels

Premixed water gels containing a substance in itself classified as an explosive shall be classified as an explosive and manufactured, transported, stored, and used as specified for explosives in this Code.

(Effective December 24, 1987)

Sec. 29-349-349. Cap-sensitive premixed water gels

Premixed water gels containing no substance in itself classified as an explosive and which are cap-sensitive as defined in Section 29-349-106 of this Code under Blasting Agent shall be classified as an explosive and manufactured, transported, stored, and used as specified for explosives in this Code.

(Effective December 24, 1987)

Sec. 29-349-350. Non cap-sensitive premixed water gels

Premixed water gels containing no substance in itself classified as an explosive and which are NOT cap-sensitive as defined in Section 29-349-106 of this Code under Blasting Agent shall be classified as blasting agents and manufactured, transported, stored, and used as specified for blasting agents in this Code.

(Effective December 24, 1987)

Sec. 29-349-351. On-site mixed water gels

Ingredients for on-site mixed water gels shall be stored as set forth in this section.

(a) Ingredients in themselves classified as Class A or Class B explosives shall be stored in conformity with Chapter IV of this Code.

(b) Ingredients, other than ammonium nitrate, not in themselves classified as explosives, shall be stored in warehouses which shall be noncombustible or fire resistive.

(c) Prilled, grained, or granulated ammonium nitrate shall be stored in accordance with Chapter IX, Code for the Storage of Ammonium Nitrate. If ammonium nitrate is stored in the vicinity of explosives or blasting agents, the separation distances specified in the Table of Recommended Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives shall be observed.

(d) Liquid ammonium nitrate solutions shall be stored in tank cars, tank trucks, or permanent tanks in a location approved by the authority having jurisdiction. Spills or leaks which may contaminate combustible materials shall be cleaned up immediately.

(Effective December 24, 1987)

Sec. 29-349-352. Electric power sources

If electric power is used it may be furnished by cable from an outside source or by a self-

contained motor generator. In the case of a self-contained power source, it shall be located at the end of the storage container opposite that at which the blasting agent is discharged. It shall have adequate capacity for the loads to be expected and be equipped with suitable overload protection devices.

(Effective December 24, 1987)

Sec. 29-349-353. Electric wiring requirements

Electric wiring carrying voltages greater than 21 volts shall be armored or in conduit and, if dry ingredients are employed, the wiring shall conform to the requirements of Class II, Division 2 of the National Electrical Code NFPA No. 70. The materials protecting the electric wiring must be of such composition that they will not be chemically attacked by the ingredients being processed.

(Effective December 24, 1987)

Sec. 29-349-354. Mixing equipment requirements

Mixing equipment for on-site mixed water gels shall comply with the requirements of this section.

(a) All electric motors, electrically operated proportioning devices, etc., shall be electrically bonded.

(b) All electric motors, electrically operated proportioning devices, etc., used for dry ingredients shall conform to the requirements of Class II, Division 2 of the National Electrical Code, NFPA No. 70.

(c) The entire loading and mixing equipment shall be cleaned periodically to insure against accumulations of ingredients.

(Effective December 24, 1987)

CHAPTER XII. SMALL ARMS AMMUNITION, SMALL ARMS PRIMERS AND SMOKELESS PROPELLANTS

Sec. 29-349-355. General provisions

In addition to all other applicable requirements in this Code, the intrastate transportation of small arms ammunition, small arms ammunition primers and smokelss propellants shall be in accordance with current U.S. Department of Transportation regulations.

(Effective December 24, 1987)

Sec. 29-349-356. Chapter provisions that do not apply

The provisions of this chapter do not apply in process storage and intra-plant transportation during manufacture of small arms ammunition, small arms primers, and smokeless propellants.

(Effective December 24, 1987)

Sec. 29-349-357. Small arms ammunition

No restrictions are imposed on truck or rail transportation of small arms ammunition other than those which are imposed by the U.S. Department of Transportation or by the presence of other hazardous material.

(Effective December 24, 1987)

Sec. 29-349-358. Small arms ammunition warehouse storage unlimited

No quantity limitations shall be imposed on storage of small arms ammunition in warehouses, retail stores and other general occupancies, except those imposed by limitations of storage facilities and consistency with public safety.

(Effective December 24, 1987)

Sec. 29-349-359. Separation from flammables

Small arms ammunition shall be separated from flammable liquids, flammable solids (as classified by the U.S. Department of Transportation), and oxidizing materials by a fire-resistive wall of one-hour rating or by a distance of 25 feet.

(Effective December 24, 1987)

Sec. 29-349-360. Storage with Class A or Class B explosives prohibited

Small arms ammunition shall not be stored together with Class A or Class B explosives (as defined by U.S. Department of Transportation regulations) unless the storage facility is adequate for this later storage.

(Effective December 24, 1987)

Sec. 29-349-361. Smokeless propellants

Quantities of smokeless propellants in shipping containers approved by the U.S. Department of Transportation not in excess of 50 pounds may be transported in a passenger vehicle.

(Effective December 24, 1987)

Sec. 29-349-362. Limits for transportation in passenger vehicles

Quantities in excess of 25 pounds but not exceeding 50 pounds in a passenger vehicle shall be transported in a portable magazine having wooden walls of at least 1 inch nominal thickness.

(Effective December 24, 1987)

Sec. 29-349-363. Transportation in passenger vehicles of quantities in excess of 50 pounds. Prohibited

Transportation of quantities in excess of 50 pounds is prohibited in passenger vehicles.

(Effective December 24, 1987)

Sec. 29-349-364. Display of warning placards

Transportation of quantities in excess of 50 pounds in other than passenger vehicles shall be in accordance with U.S. Department of Transportation regulations, except that warning placards shall be prominently displayed when more than 250 pounds are being transported.

(Effective December 24, 1987)

Sec. 29-349-365. Shipping container storage

All smokeless propellants shall be stored in DOT-approved shipping containers.

(Effective December 24, 1987)

Sec. 29-349-366. Residential storage

Smokeless propellants intended for personal use in quantities not to exceed 50 pounds may be stored in residences; quantities over 20 pounds but not to exceed 50 pounds shall be stored in a wooden box or cabinet having walls or at least 1 inch nominal thickness.

(Effective December 24, 1987)

Sec. 29-349-367. Commercial establishment displays

Not more than 50 pounds of smokeless propellants, in containers of 1-pound maximum capacity, shall be displayed in commercial establishments. Commercial stocks of smokeless propellants over 20 pounds and not more than 100 pounds shall be stored in approved wooden boxes having walls of at least 1 inch nominal thickness. Not more than 50 pounds shall be permitted in any one box.

(Effective December 24, 1987)

Sec. 29-349-368. Commercial stock storage

Commercial stocks in quantities not to exceed 750 pounds shall be stored in storage cabinets having wooden walls of at least 1 inch nominal thickness. Not more than 400 pounds shall be permitted in any one cabinet.

(Effective December 24, 1987)

Sec. 29-349-369. Storage in excess of 750 pounds to be in magazines

Quantities in excess of 750 pounds shall be stored in magazines constructed and located as specified in Chapter IV.

(Effective December 24, 1987)

Sec. 29-349-370. Small arms ammunition primers

Small arms ammunition primers shall not be transported or stored except in the original shipping container approved by the U.S. Department of Transportation.

(Effective December 24, 1987)

Sec. 29-349-371. Truck or rail transportation

Truck or rail transportation of small arms ammunition primers shall be in accordance with U.S. Department of Transportation regulations.

(Effective December 24, 1987)

Sec. 29-349-372. Primers limited in passenger vehicles

Not more than 25,000 small arms ammunition primers shall be transported in a passenger vehicle.

(Effective December 24, 1987)

Sec. 29-349-373. Primer storage limited in residence

Not more than 10,000 small arms ammunition primers may be stored in residences.

(Effective December 24, 1987)

Sec. 29-349-374. Primer displays limited

Not more than 10,000 small arms ammunition primers may be displayed in commercial establishments.

(Effective December 24, 1987)

Sec. 29-349-375. Primers to be separated from other materials

Small arms ammunition primers shall be separated from flammable liquids, flammable solids (as classified by the U.S. Department of Transportation), and oxidizing materials by a fire-resistive wall of one-hour rating or by a distance of 25 feet.

(Effective December 24, 1987)

Sec. 29-349-376. Primer storage limitations

Not more than 750,000 small arms ammunition primers shall be stored in any one building, except as provided in Section 29-349-377; not more than 100,000 shall be stored in any one pile, and piles shall be at least 15 feet apart.

(Effective December 24, 1987)

Sec. 29-349-377. Primer storage in magazines

Quantities of small arms ammunition primers in excess of 750,000 shall be stored in magazines in accordance with this Code.

(Effective December 24, 1987)

CHAPTER XIII. FORBIDDEN EXPLOSIVES

Sec. 29-349-378. Forbidden explosives list

Explosives forbidden or not acceptable for transportation by these regulations shall include, but are not limited to:

(a) Liquid nitroglycerin.

(b) Dynamite (except gelatin dynamite) containing over 60 percent of liquid explosive ingredient.

(c) Dynamite having an unsatisfactory absorbent or one that permit leakage of a liquid explosive ingredient under any conditions liable to exist during storage.

(d) Nitrocellulose in a dry and uncompressed condition in quantity greater than 10 pounds net weight in one package.

(e) Fulminate of mercury in a dry condition and fulminate of all other metals in any condition except as a component of manufactured articles not hereinafter forbidden.

(f) Explosive compositions that ignite spontaneously or undergo marked decomposition rendering the products of their use more hazardous when subjected for 48 consecutive hours or less to a temperature of 167°F. (75°C.)

(g) Explosives containing an ammonium salt and a chlorate.

(h) New explosives until approved by the U.S. Department of Transportation except that a permit may be granted for transportation and possession for laboratory examination of such explosives when under development by responsible research organizations.

(i) Explosives not packed or marked in accordance with the requirements of the U.S. Department of Transportation.

(j) Explosives condemned by the U.S. Department of Transportation.

(Effective December 24, 1987)

STATE OF CONNECTICUT

DEPARMENT OF ENERGY & ENVIRONMENTAL PROTECTION

GUIDANCE DOCUMENT FOR EVALUATING POTENTIAL HYDROGEOLOGIC IMPACTS ASSOCIATED WITH BLASTING & DEVELOPMENT ACTIVITIES

Bureau of Water Protection and Land Reuse
Remediation Division

December 2019
(Rev. 12-12-19)

The following guidance is provided by the Department of Energy & Environmental Protection's Remediation Division for use by municipal land-use officials when evaluating proposed developments, road construction projects, or quarries where significant earth removal and/or blasting activities are likely to occur. Because of those types of activities, there is concern for possible negative impacts to the quality and quantity of water in neighboring drinking water wells, as well as other environmental factors such as erosion, sedimentation, and decreased surface water quality conditions.

One of the primary concerns is acid rock drainage (ARD), which is a natural process, but can be exacerbated when rock is crushed and used for fill or other purposes that expose the freshly crushed rock to precipitation. ARD is caused by the presence of bedrock containing high levels of iron sulfide (which is present in Eastern and Western Highlands and sometimes the central valley of CT), especially such rock that is freshly exposed or crushed and has been subjected to the elements/precipitation. Under these conditions, there is an elevated risk for mobilizing naturally-occurring iron, manganese, and sulfur, which may adversely affect groundwater and drinking water quality. In addition, increased mobilization of arsenic, uranium and/or radon can occur in areas where these naturally-occurring minerals are present in the bedrock formation.

The Department recommends that land use officials consider the following as part of the overall application review process:

1. The developer or applicant (the Applicant) should retain a geologist/hydrogeologist or engineer (Environmental Professional) to evaluate the underlying bedrock in terms of its potential to cause ARD. The town's land-use office should make sure that the Applicant acquires the services of a qualified Environmental Professional that has experience testing the mineralogy and chemistry of the rock material and evaluating the potential impacts of ARD. As such, there needs to be a detailed site plan developed by the Applicant's Environmental Professional that addresses best management practices for minimizing ARD conditions by ensuring proper handling, storage or disposal of the rock material on- and off- site and minimizing its contact with infiltrating precipitation and surface water runoff at the site.

2. After identifying all drinking water wells within a 500-foot radius of the area to be disturbed by proposed construction activities, the Applicant's Environmental Professional should evaluate which drinking water wells need to be sampled in order to establish baseline drinking water quality conditions prior to any active earth work or blasting activity. Consideration should be given to factors such as: well type and construction details; the nature, geologic structure, and mineral make-up of the underlying bedrock; and blasting/rock removal techniques. The town's land-use office, as part of the permit application review process, or as part of the pre-blast survey if blasting is necessary, should also require that the Applicant document the yield and capacity of the wells before the site work or blasting commences. Testing the raw water quality (prior to any water treatment devices) of nearby drinking water wells prior to construction or blasting activities will establish a baseline for comparing post-project test results, in the event a property owner makes a complaint that the project activities negatively impacted their well.

3. In the absence of drinking water wells within 500 feet of the area to be disturbed, the Applicant's Environmental Professional should identify the closest drinking water wells, if any, within a 1,000-foot radius. Depending on the location, proximity, well construction and other factors, consideration should be made as to whether the proposed blasting activity poses a concern to the quantity or quality of water at these locations. Should a concern exist, and in the absence of closer drinking water wells to monitor, the Department recommends a minimum of annual monitoring of water levels and water quality of the closest drinking water well until the development project is completed and the site has been stabilized.

4. The Department recommends that drinking water wells at risk of ARD from proposed blasting and earth removal activities be analyzed for the following drinking water quality parameters:

    - pH
    - odor
    - color
    - turbidity
    - total iron
    - total manganese
    - nitrate
    - nitrite
    - sulfate
    - coliform bacteria
    - arsenic
    - uranium
    - radon
    - ammonia perchlorate *(if the salts ammonium, potassium, magnesium, or sodium perchlorate is an ingredient of the blasting agent)*
    - total petroleum hydrocarbons using the CT extractable total petroleum hydrocarbons test method *(if the blasting materials contain ammonium nitrate fuel oil mixtures)*

    All testing should be performed in an approved laboratory certified to test drinking water by the Connecticut Department of Public Health's Laboratory Certification Program.

5. Follow-up well water sampling should occur within one to two months following the blasting activity and again once the site has stabilized and ground cover has been established. The plan for such water sampling should be part of the Applicant's land-use application. Should the development project and site work continue over a prolonged period of time, annual testing of the potentially impacted drinking water wells should be performed to ensure there are no adverse effects to the drinking water quality.

6. If there is a change in drinking water quality during or after the blasting activity, the well owner should notify the Applicant and/or blasting contractor of the condition, and also

notify their local health department and DEEP's Remediation Division (860-424-3705) of the condition.

7. The static water level in potentially affected drinking water wells should also be monitored during and following completion of the site work and blasting activity to determine if the static water level in the well decreases to the extent there is a problem for domestic use. Major site work that significantly alters infiltration rates, diverts surface water flow, or creates deep rock cuts or fractures may seriously deplete the volume of water in nearby overburden or drilled bedrock drinking water wells. Wells accessed for purposes of water level monitoring will require the well to be properly disinfected prior to being reactivated following the Department of Public Health's *Publication #27: Disinfection Procedure for Private Wells*.

Other Considerations:

- There may be additional issues relating to blasting activities that the town, through its Fire Marshal, may need to address by the pre-blast survey. Such issues may include the potential for structural damage to neighboring properties due to air blasts and vibrations, and/or noise and dust control. Additionally, if municipal officials receive complaints regarding fugitive dust emissions due to the blasting and/or earth removal activities, DEEPs Bureau of Air Management (860-424-3436) can be contacted for guidance and possible follow-up inspection.

- The municipality may want to consider having large-scale developments, where significant site work including blasting is planned, be evaluated by the Connecticut Environmental Review Team (CTERT). A request for an ERT review must come from the municipality's chief elected official or the chairperson of one of the town's land-use or economic development commissions. Information regarding the CTERT and applying for an ERT review can be found at www.ctert.org or by calling 860-345-3977.

- Activities with proposed soil disturbances of one (1) acre or more that have not obtained local approval involving an erosion and sediment control review must register for the DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The Applicant can obtain information regarding the general permit at www.ct.gov/deep/stormwater.

Donovan D. Rypkema

The (Economic) Value of National Register Listing

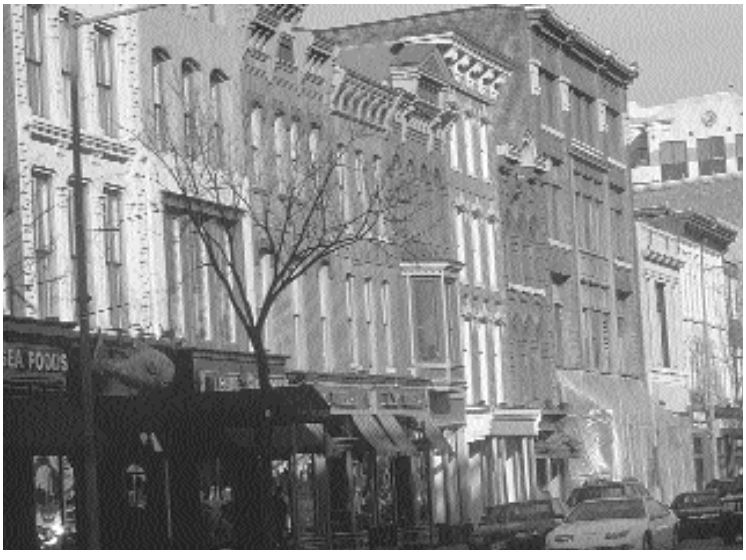
To ask if properties listed in the National Register of Historic Places have value is to ask a tautological question. Of course they have value or they wouldn't have been listed in the first place. The nomination process to the National Register itself implicitly requires the source and the substantiation of the property's value—architectural, cultural, associative, historical, etc. Further, by implication the National Register property is more valuable on some set of criteria than non-listed properties, otherwise everything would be National Register eligible.

So historic preservation in general and National Register listing in particular doesn't have one value, it has a multitude of values—cultural, environmental, social, educational, aesthetic, historical. The question becomes, "Do these values manifest themselves in economic value?" Let's begin with what we do know, and that is about local designation. Over the last decade a number of analyses have been conducted asking, "What is the impact on property values of local historic districts?" Using a variety of methodologies, conducted by a number of independent researchers, this analysis has been undertaken in New Jersey, Texas, Indiana, Georgia, Colorado, Maryland, North and South Carolina, Kentucky, Virginia, and elsewhere. The results of these studies are remarkably consistent: property values in local historic districts appreciate significantly faster than the market as a whole in the vast majority of cases and appreciate at rates equivalent to the market in the worst case. Simply put—local historic districts enhance property values.

Anecdotally, it has been found that when a local district has the greatest positive impact on property values four variables are usually in place: clear, written design guidelines for the affected properties; staff for the preservation commission; active educational outreach by the staff and commission to property owners, real estate brokers, architects, builders, etc.; and consistent and predictable decisions by the commission.

Since listing in the National Register provides little protection for an individual property, sources of value enhancement created by a local district do not exist. There are, however, at least four situations in which listing in the National Register does often add economic value to the listed properties:

- When the properties are commercial, rather than owner-occupied residential, the eligibility for the Federal Rehabilitation Tax Credit can add economic value to the properties. At a recent symposium funded by the National Park Service and chaired by the Urban Land Institute, some developers noted that in their communities, sellers of unrehabilitated properties were raising the price of listed buildings to reflect the tax credit opportunity potential of the investment.
- In some communities the creation of a National Register district triggers the creation of a corresponding local district. This local district then would provide the protections (and perhaps incentives) as noted above, leading to economic value enhancement.



Listing can add economic value to commercial properties since National Register status is a prerequisite to using the Federal Rehabilitation Tax Credit.

National Register residential neighborhoods may command a premium if local buyers and the real estate community understand and appreciate the significance of designation.

- In real estate markets that have a level of knowledge and sophistication among both real estate professionals and buyers regarding historic properties, National Register listing can have an economic premium attached. How do you know if the local market has reached that point? When the real estate ads say, "This house is located within the XYZ National Register Historic District," or "This house is listed in the National Register." The broker wouldn't pay for the extra lines in the ad if he/she didn't believe that potential buyers responded knowingly and positively to that information.
- A common characteristic of neighborhoods—both residential and commercial—that are seen as places of sound investment is the existence of a strong citizen-based advocacy organization. Often the creation of a National Register district is a catalyst for the creation of such a citizen advocacy group. The group may have been formed for the specific purpose of getting a neighborhood listed, but once that mission is accomplished the organization expands its focus to broader neighborhood advocacy. This can have a positive affect on property values.

But perhaps it makes sense to step back briefly from the specific question, "Does National Register listing add economic value?" to a broader identification of the variables that affect value. In real estate economics there are identified the Four Forces of Value, those factors in the marketplace that push the value of a given piece of real estate—historic or otherwise—up or down. Those forces are physical, social, economic, and political. If as preservationists it is our intention to positively influence the value of historic properties it will be necessary to knowledgably bring those forces into play.

The physical force of value is the only one of the four even partially emerging from within the property lines. A leaky roof, the wrong kind of mortar, deteriorating foundation walls, sandblasted bricks are all examples of physical forces that will diminish the economic value of a building. But physical forces beyond the lot lines will also have an impact. The condition of the streets and sidewalks, the proximity of parks, levels of public maintenance, and whether nearby properties are vacant or occupied are all examples of the physical force of value over which the individual property owner has no direct control.

The social force of value is how people understand and attach importance to any given property characteristic. When more people hold historic resources "valuable" by any criteria, there will be a corresponding increase in the economic value of those resources.

The economic force of value is more complex than it may seem. If financing is more difficult to obtain for historic properties than for new properties, there will be a relative adverse impact on historic properties' values. Adaptive re-use of historic properties, when the use for which they were built is no longer in demand, is central to the buildings having economic value. The proposed Historic Homeowners Tax Credit, by adding an economic incentive for re-investment, will add economic value.

The last of the four forces of value is political. To the extent that elected officials and other political decision makers recognize and emphasize the importance of heritage buildings and correspondingly take public policy actions to encourage appropriate rehabilitation, the economic value of historic buildings will increase.

Listing in the National Register of Historic Places does not necessarily add economic value to a given piece of real estate. Rather, National Register status can be an important catalytic tool to utilize all four forces of value. National Register listing is one of a basket of tools that can be used to assure that the economic value of historic preservation takes its rightful place among the multiple values that historic buildings contribute to American communities of every size.

Donovan D. Rypkema is principal in Place Economics, a real estate and economic development firm in Washington, DC.

Photos by the author.

Essential Details & Information Missing or Changed from the GFI Applications

accompanied by

Examples of Legal & Geological Sophistry

&

Assorted Prevarications.

including

Unanswered Questions from +/- one year ago

Douglas Schwartz December 19, 2024

1. MISSING & ESSENTIAL INFORMATION

11.3.3 Proceedings:

A. An **incomplete Special Permit application** may be **denied** in accordance with **§11.6.3**.

11.6.3 Incomplete Applications:

A. . . . **The Commission shall have the final discretion to determine whether an application is substantially complete**.

B. It is the responsibility of the applicant to provide a complete application, and failure to do so is **grounds for denial** of the application. The Commission may deny an incomplete application

11.3.4 Special Permit Criteria:

the applicant shall have the **burden to prove**:

B. that transportation services would be adequate and that the uses **would not cause traffic congestion** or undue traffic generation that would have a deleterious effect on the welfare or the safety of the motoring public;

C. . . . that the use(s) would not be noxious, offensive, or detrimental to the area by reason of odors, fumes, **dust, noise, vibrations, appearance, or other similar reasons**;

D. that **no adverse effect** would result to the **property values or historic features** of the immediate neighborhood;

E. that the **character of the immediate neighborhood would be preserved** in terms of scale, density, intensity of use, **existing historic/natural assets/features** and architectural design;

F. In accordance with CGS §22a-19, that the proposed uses would not cause any **unreasonable pollution, impairment or destruction of the air, water and other natural resources of the state**;

Jay Cashman, December 12, 2024: 4:12:45 of the video:

"One thing I found about the silica, is the silica, the testing, actually happens on the person working inside the **quarry**. . . . It's also overseen by the federal government."

MSHA does not regulate excavations, only quarries and mines.

This document contains numerous examples of essential information the Commission has not been provided.

- Has there been an intentional effort to only present positive information?
- Has there been an effort to **divert attention away** from critical issues calling for denial?

The alleged purpose for the quarrying is to "**regrade**" the site for unspecified future buildings. Yet no definitive purpose, use, or tenants have been put forth to justify any such buildings. The "ultimate goal" is claimed to be "26 acres of clean, developable land." It is **not credible** that a decade and countless millions would be expended to cut down a mountain (containing at least tens — hundreds? — of millions of dollars of processed rock) simply to "regrade" for speculative, nebulous future development.

- **An actual excavation permit would be ancillary to a specific site plan depicting the end result.**
- **An actual excavation permit would be limited to a short period, e.g., 18 months, as is the case in towns such as Waterford**.

At the top of the list of incomplete aspects of the GFI application is the failure to include a plan for the alleged eventual use. This is obviously a quarry application that would yield many tens (hundreds?) of millions of dollars in profits.

There has been no analysis provided of the potential for the blasting to fracture the proximate high-pressure **gas main** in Route 12 or the one running down the south side of the GFI property driveway. Gas main explosions create sub-nuclear blasts, sometimes producing craters. If a gas main explosion occurs, and tanks of highly toxic compounds become engaged, the financial repercussions to the town could be bankrupting. Because of the potential loss in property values (perhaps permanent and total if a superfund site is created), the town could be liable in a class action suit brought under the doctrine established in the Supreme Court's Knick v. Township of Scott decision. The combined compensatory and punitive damages, and legal fees, could be astronomical.

High-Pressure Gas Line Fire Creates Pillars Of Flame | NBC News
Nov 21, 2017
Residents of a Detroit suburb were warned to avoid the area as huge fireballs were thrown into the night sky.

Massive crater all that's left at gas pipeline site
https://www.facebook.com/DetroitNews/videos/10155136538528857/

- No calculations in the stormwater report of what portion of the 40 acres to be quarried will end up as impervious, bare rock surfaces. The report **pretends** that 100% of this area will be pervious.
- No calculations in gallons of potential runoff for various rainfall scenarios.
- No accounting for when water in surface basins freezes.
- No stormwater runoff plan, only sediment control basins.
- No quantification of the amount of **calcium chloride** to be used.
- No details on the impact of **calcium chloride** on the sensitive Thames River ecosystem.
- After 10 +/- years of operation, which is the total weight of **calcium chloride** destined for the Thames River ecosystem?

No IWWC review of the current application

The reason every municipality has an IWWC is to enforce provisions of the federal Clean Water Act. Which means the town's obligation to enforce the federal Clean Water Act will be neglected. Which means citizens will need to enforce the Act in the federal courts, as provided for under the federal statute.
https://www.epa.gov/enforcement/clean-water-act-cwa-and-federal-facilities#Citizen%20Enforcement

> CWA § 505(a) allows citizens to file a civil action against any Federal agency that is alleged to be in violation of an effluent standard or limitation or an order issued by EPA or a State with respect to such standards and limitations.

According to Margaret LaForest, testimony of December 12, 2024:

> "All parties concur that a new application to the IWWC is not necessary."

The intervenor and members of the public do not "concur."

Ms. LaForest further stated:

> "They have proposed pre-blast surveys of homes within a 750 foot radius, which is **three times the normal protocol**."

750 divided by 3 = 250 feet. Which is **nonsense**. There is no such "normal protocol." As noted here, the state of Maine, by statute, requires a pre-blast survey within a half mile, which is 10.56 times as far. Because the area of a circle increases by the square of its radius, a half mile (2,640 feet) radius circle contains 111 times the area of one 250 feet in radius. The DEEP Blasting Guidance (which the Planner referenced in her November 2023 interrogatories to the applicant) protocol states:

> After identifying **all drinking water wells within a 500-foot radius** of the area to be disturbed by proposed construction activities, the Applicant's Environmental Professional should evaluate which **drinking water wells need to be sampled** in order to establish baseline drinking water quality conditions prior to any active earth work or blasting activity. Consideration should be given to factors such as: well type and construction details; the nature, geologic structure, and mineral make-up of the underlying bedrock; and blasting/rock removal techniques. The town's land-use office, as part of the permit application review process, or as part of the pre-blast survey if blasting is necessary, should also **require that the Applicant document the yield and capacity of the wells before the site work or blasting commences**. Testing the raw water quality (prior to any water treatment devices) of nearby drinking water wells prior to construction or blasting activities will establish a baseline for comparing post-project test results, in the event a property owner makes a complaint that the project activities negatively impacted their well.

https://portal.ct.gov/-/media/deep/site_clean_up/potable_water/blasting-guidance-dec2019.pdf

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FEDERAL PERMITTING

MSHA, CLEAN WATER ACT, and CLEAN AIR ACT PERMITS ARE REQUIRED

The applicant has made clear that MSHA monitoring is required, but has avoided discussion of the water and air permits also required. Under the National Historic Preservation Act, no federal permit can be obtained if it would lead to destruction of a property listed or **eligible** for listing on the National Register of Historic Places. Mount Decatur, the entire mountain, is listed on the Connecticut Register of Historic Places. The entire mountain is eligible for National Register listing.

The **stormwater management report** contains 165 instances of quantification of **percent impermeability** of various surfaces, but **not one mentions 100% impermeable** surfaces. Most of the 165 references are considerably under 20% impermeability. **Bedrock is impermeable**. Extensive analysis is included in the report for the runoff rate from various soils, but the soils will be stripped from a good portion of the mountain

and this “analysis” is irrelevant. The first IWWC review was not an adversarial process and therefore did not elicit probative facts. Until IWWC review occurs, P&Z should send this application to IWWC first.

40 acres are slated to be quarried, yielding 26 acres of a level surface. This presumably means the remaining 14 acres (35%) will be left, presumably as exposed bedrock. Each inch of rainfall on an acre is 27,154 gallons. For 14 acres this translates to 380,156 gallons. A 4-inch rain yields over 1.5 million gallons. In the winter, when the surface of the ground freezes, the remaining 26 acres will further become **impermeable**. As will the surface sediment retention basins. Each inch of rain falling on 40 impermeable acres yields over one million gallons of runoff.

The Zoning “Compliance” Manual reports blasting will occur twice a week in the summer, once a week in the winter. Mr. Trinkaus has calculated that the stormwater report is woefully deficient. But common sense tells us that a hard rain in the winter, when the ground is frozen, will produce millions of gallons of runoff heading into Tom Allyn Brook, a component of the Waters of the United States and protected under the Clean Water Act. Some of the worst flooding occurs in the winter, when the ground is frozen.

Margaret Laforest, December 12, 2024, 1:27:05 of the video:

> “For the GFI project, worker safety will be regulated by both OSHA and **MSHA**. The goal of these federal agencies is to guarantee safe working conditions **for employees**. MSHA compliance includes two annual unannounced site visits and enforcement of the federal mandate that emissions are mitigated sufficiently to protect workers without the use of personal protection equipment. GFI is committed to spraying misting and on all other equipment, including conveyors. **Virtually no other excavation site in southeastern Connecticut is providing these mitigation measures**.”

The final sentence above is accurate, as confirmed by additional submitted testimony regarding other local quarries, including the Bozrah and Baldwin Hill examples. Yet the applicant has told us that because Baldwin HIll was approved, GFI must be approved (*i.e.*, **the Commission should ignore the dysfunctionality and absence of zoning enforcement at Baldwin HIll**). An accompanying exhibit itemizes some of the MSHA fines assessed to Maine Drilling & Blasting at other quarries/mines it operates. If nothing else, this confirms the validity of Murphy's Law.

Exhibit #257 Vivian Zoe, December 17, 2024:

> While I have been informed by Ledyard Fire Marshal James Mann on numerous occasions that the vibrations I feel from the blasting that occurs fairly regularly at Baldwin Hill are nothing to worry about, I'm afraid I can't Agree. The vibrations are NOT air pushed by the blasts, as Mr. Mann asserts. I state this with certainty because I am an artist whose studio is in my home below grade and I feel the rumble through my concrete floor. This is bad enough and I wish there was some way that the Town (and Mr. Mann) would take my complaints seriously.

Ms. Zoe resides on Pinelock Dr., about 4,400 feet from the Baldwin HIll blasting.

As the Maine Drilling & Blasting video from Baldwin Hill revealed, massive quantities of dust are emitted into the air during blasts. There is no way to prevent this dust from escaping. The spec sheets —for the quarrying machinery — that are included in the Zoning “Compliance” Manual reveal enclosed, dust-filtered cabs for machine operators. Almost every worker will be operating machinery most of the time, not walking around outside through the quarry. MSHA is tasked with monitoring the safety of quarry workers, not those residing in adjacent neighborhoods, including children and those with compromised pulmonary functioning.

- The rock crusher is of sufficient capacity to require a federal Clean Air Act permit.

- The diesel generators powering the “electric” machinery will emit both noise and emissions. The Commission has not received information regarding the extensive **diesel emissions** and their impact on surrounding air quality.

- No examples have been provided of a Maine D&B quarry operating in such close proximity to residences that is without OHSA and MSHA violations/fines, or neighborhood complaints and damage. Or any quarry operated by anyone in such proximity to residences that does not result in degradation to the surrounding properties.
- No examples of any quarry anywhere which successfully mitigates escaping dust from blasting, drilling, or crushing operations.
- No mention of the town’s evacuation or shelter-in-place protocols for another accidental release at American Styrenics, due to the presence of extremely toxic hazardous materials. The Commission has been given no inventory of the specific hazardous compounds stored in the tanks.
- No information has been disclosed as to whether **methyl isocyanate** is still stored on site, with the potential to kill thousands in surrounding towns. The chemical warfare agent **phosgene gas** is a key ingredient used in the manufacturing process of methyl isocyanate. Phosgene is a colorless gas that can be **used to make plastics**, pesticides, and other chemicals.
- No protocol has been provided for reporting MSHA violations/fines to the Land Use Department. A department which remains blissfully ignorant of the health and safety violations federal inspectors have identified on the Baldwin HIll property.
- There has apparently been no zoning curiosity or enforcement of the Baldwin Hill quarry permit, leading to the conclusion there would be none for GFI either.
- No information regarding the toxic contents of the environmentally capped area and accompanying monitoring wells, or provisions for conducting monitoring.
- No **mapping of nearby wells** in the area intended to be surveyed for pre-blast data. This information was requested by the Planner over a year ago. All wells in the pre-blast survey area should be mapped.
- No provision to provide homeowners with copies of their pre-blast videos, etc.
- No **bonding or mediation** process for damage claims. Homeowners are left to fend for themselves.
- No geological/hydrological study of the impact on Chapman Lane wells from removing the northern two-thirds of the mountain. If those wells are impacted, it falls on the town’s WPCA to provide water to those homes.
- No mention of the **blatant bedrock fractures on the east side of Mt Decatur**, creating an extreme safety hazard due to the potential for flyrock generation.
- No mention of the **mud seam** (i.e., a void in the rock with the potential for generating flyrock) encountered during the test drilling and reported in the **2023 geological report,** a report omitted during the second series of hearings. This has been resubmitted as **Exhibit #246-3**. The excerpt below explains in part why it probably was next resubmitted by the applicant for the current hearings.

From the geological report submitted in 2023 :

3.0 MINING OPERATIONS

The Gales Ferry Intermodal operation is currently under initial development with no quarry excavation area or processing plant currently at the site. The planned excavation area will encompass approximately 30-35 acres with the floor elevation started at approximately 30' elevation. Based on the rock encountered in both outcrops and the core samples, two primary rock types are present, a pinkish gray granite and a banded gneiss, The rock units noted, are mapped as members of the Sterling Plutonic Group, and interpreted as Pennsylvanian in age (approximately 300 million years old). The two primary lithologies (rock types), to be mined for construction aggregates, are a medium to dark gray, fine to medium crystalline, banded, K-feldspar-quartz-mica gneiss and a pinkish gray fine to medium crystalline granite. In the upcoming two year period (initial cycle), production will be primarily from a single production lift, started at the 25-30' elevation. A quarry face and slot cut will be developed on the southern end of the site, adjacent to the existing industrial facility, and driven to the south and southeast into the higher topography and away from the river flats. As the initial quarry face is driven to the southeast another production 50-60' high bench will be started as the topography dictates. Unconsolidated overburden and vegetation will be removed adjacent to the immediate production area. As the quarry is expanded overburden will be stripped back a minimum of 25-50' from the production faces. In some areas, the top 10 to 15 feet of surface rock may be weathered or iron stained, so this material, where encountered, will be removed and either wasted or used for non-NYSDOT materials.

- No mention of boulders precipitously balanced above the Chapman Lane homes and church. Or an analysis of whether **repetitive** blasting vibrations can shake them loose.
- **No mention of the potential blasting impact of the Eversource gas main running down RT 12 or along the south side of the driveway**

Information has not been provided regarding **uranium concentrations** (which relates to the production of radon gas, including in wells) in the bedrock or the soil (which is derived from the underlying bedrock. Reference **Exhibit 246-1** for a study, co-authored by CT State Geologist Margaret Thomas, on the geochemistry of state soils. Ledyard is in the Avalon belt (Figure 1). Figure 11 below reveals that in this region the uranium levels are **by far the highest in New England**: Figure 11, reproduced below.

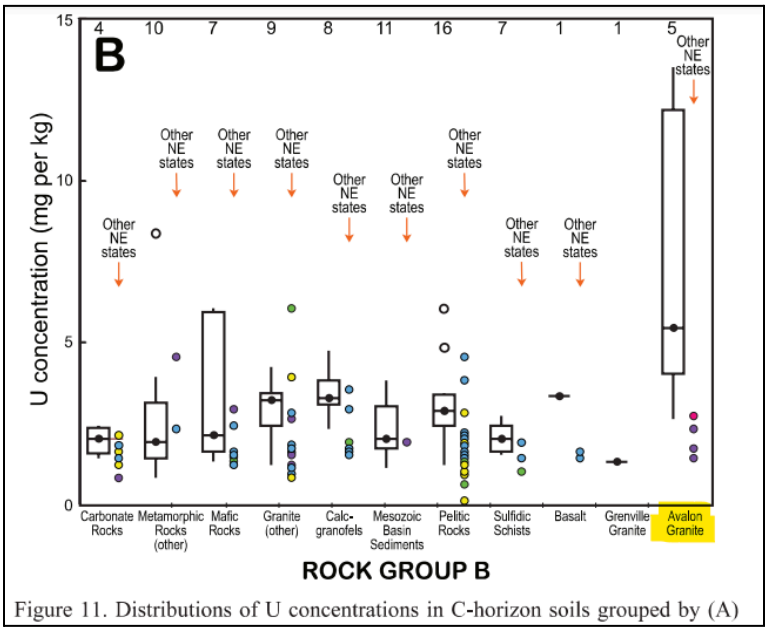

Figure 11. Distributions of U concentrations in C-horizon soils grouped by (A)

The USGS publication, **Arsenic and Uranium in Private Wells in Connecticut** https://pubs.usgs.gov/of/2017/1046/ofr20171046.pdf shows elevated arsenic levels in wells drilled in Hope

Valley Alaskite Gneiss, as is found in Mount Decatur. Arsenic is a highly toxic carcinogen, both when inhaled and ingested.

Geologic unit name	Geologic unit code	Number of samples		MCL, percentage[1] of water samples with concentrations, in micrograms per liter	
		Arsenic	Uranium	Arsenic >10 µg/L	Uranium >30 µg/L
Avalon granite					
"Scituate" Granite Gneiss	Zss	1	1	0	0
Hope Valley Alaskite Gneiss	Zsh	5	3	20.0	0
Plainfield Formation	Zp	3	2	0	0
porphyritic phase of Potter Hill Granite Gneiss	Zspp	1	1	0	0
Potter Hill Granite Gneiss	Zsph	2	2	0	0
Potter Hill Granite Gneiss and Narragansett Pier Granite undivided	Zsph + Pn	1	1	0	0
Rope Ferry Gneiss of the "Waterford Group"	Zwr	5	5	0	0

No response to GU's request for leak testing in a half mile radius. If wells require testing to establish a pre-blasting baseline, why not water mains, including those in Route 12 that are within less than 100 feet from the blasting boundary?

The **DEEP Blasting Guidance Manual** has not been submitted by the applicant. It has been supplied as a separate exhibit.

- No impact study on property values in adjacent National Register of Historic Places districts. There are no quarries placed adjacent to National Register listed districts.
- The alleged appraisal study failed to take into consideration that homes in National Register listed districts **enjoy a premium in value** compared to other homes. [see exhibit on the enhanced property values enjoyed by National Register listed homes] https://www.hs-intl.com/wp-content/uploads/2016/08/placeeconomicspub2002.pdf
- No provision to provide berms or other suppression for when blasting.drilling occurs 150 feet or more above the Rt 12 grade level, a point emphasized by the HMMH analysis.
- No decibel levels provided for the blasts or warning whistles.
- No analysis of sound or dust impacts on Uncasville residents (potential litigants against Ledyard) in the sound and dust modeling studies.
- No inventory of the **Allyn's Point hazardous chemicals** and their potential to **again** trigger a potential mass casualty even if the tanks are ruptured by flyrock, compromised by vibrations, and/or combust — perhaps from a high-pressure natural gas line explosion, as occurred in 1999 and 2017. These tanks are within a few hundred feet of the blasing.
- No pre-blast surveys have been offered regarding these storage tanks. If a foundation or sheetrock cracks, or a well becomes compromised, that is an **inconvenience**. If the hazardous materials present are released, that could be a **tragedy**.

Unanswered questions linger from the **January 11, 2024 memorandum**:

https://ledyardct.legistar.com/View.ashx?M=F&ID=12609849&GUID=EE4654BD-2943-43D7-B4F9-A866A230A747

- "The materials list mentions chainsaws and logging trucks."
- "What is being done to address the extremely noisy process of clearcutting trees?"
- "What is the typical noise level for logging activity?"

- "The processed gravel piles are not contained in any way. The area showing the smaller
- pile is immediately adjacent to the 100ft wetlands buffer.
- **What is being done to prevent stone-dust laden runoff into the buffer area and potentially the wetlands**?"
- "Are vehicles and equipment fueled on site? Response provided 1/9/24. Vehicles will be
- fueled on site. No fueling area shown – **no spill prevention plan provided**."

"8 .16 D states that the work will "not be a source of dust pollution or siltation." A (granite) rock quarrying/processing operation is **inherently a source of dust** and siltation …**silica dust in particular**. This is a well-known fact there are many studies out there to confirm… and generally, the reason why **large rock quarries are NOT in the middle of neighborhoods**. They tend to be in more remote locations or in more industrial areas not near residential uses for a reason.

What will the potential particulate matter (PM) generated be from all the activity and vehicles per year? **There are ways to calculate the potential tons per year of PM generated from an excavation or quarrying operation that includes dust** from rock crushing, screening, and conveying, truck loading and unloading, stock piles and also PMs in exhaust from diesel trucks that are used in excavation, rock crushing and logging operations. **No information was provided by the applicant about the potential dust or PMs that might be generated**, and the only information provided about dust control was predominantly verbal assurance that key areas would be sprayed down with water. **This will not control all the dust and is something that is very hard to monitor or enforce**.

7. Special Permit Criteria:

C. that the proposed uses and structures would be in harmony with the appropriate and orderly development of the Zoning District in which they are proposed to be situated, and that the use(s) **would not be noxious, offensive, or detrimental to the area by reason of odors, fumes, dust, noise, vibrations, appearance, or other similar reasons**; Not nearly enough information has been provided to demonstrate compliance with these criteria. **This is the most important part of this application**. The **burden is on the applicant** to provide enough information **WITH** their application to demonstrate that they will not exceed State Noise level maximums at the property boundaries, or that they will not create **fugitive dust** that would be considered potentially dangerous or a nuisance, or why they are so confident that the vibrations from multiple years of consistent blasting **will not impact nearby wells or the public water lines** (one of which is the regional water supply line that runs under the Thames River), etc. A statement stating that they will comply is simply not sufficient.

For a Use requiring a Special Permit, the Commission must determine whether that Use is **<u>suitable for the particular piece of land</u>** on which it is proposed. . . .
<u>Special permits exist because not all permitted uses are appropriate on every parcel within the particular Zone it is situated. Just because the property is Zoned Industrial does not mean that any Industrial Use is appropriate</u>. . . .

[*end of January 11, 2024 nterrogatories*]

DUST

- No relevant wind patterns data for the property and its varied microclimates. There is a reason the neighborhood 750 feet across the river is called Point Breeze.
- No consideration of seasonal or diurnal temperature variables. Hot air rises, cold air sinks.

- No consideration of the extreme topographic features present, or the dynamic nature of the topography as the quarrying proceeds. Fort Griswold conditions, overlooking Long Island Sound, are somehow supposed to possess relevance.
- No accounting of the negative health implications of large dimension dust particles.
- **Zero mention of silica dust in the particulate study**, which is not only absurd, but is a **clear effort to prevent the Commission from receiving highly relevant data.**
- No means of keeping dust from escaping the property or monitoring this.
- No means of keeping dust from contaminating the property itself.
- No plan for storage, disposition, or wetting of stone dust to prevent it from becoming windblown. Once the mist evaporates, which except for periods of rain will be mostly in a matter of minutes or hours, the dust is free to become airborne. Unless a 24/7 solution is found (which does not exist), dust on surfaces and in piles will become windblown immediately after evaporation.
- No details of how or where stone dust will be collected, stored, or transported. As the aerial imagery of Baldwin Hill reveals, this is among the leading causes of concern.
- **No mention of how wind dispersal of stone dust from the entire quarry surfaces (not just in piles) will be prevented.**
- **No quantification of the volume of stone dust to be generated.**
- **No mention of anti-tracking pads or other measures to prevent tracking dust on to Rt 12.** Even the site plan for the dysfunctional Baldwin Hill **quarry** (not "excavation") contains a proposed anti-tracking pad for exiting trucks. Whether the pad actually exists is unclear.

- **No mention of the required federal Clean Air Act permit to operate a rock crusher.**
- **No mention of the federal Clean Water Act permitting required** for the average of over 50 million gallons annually of rainfall experienced on the 40 acres, much of which will flow into Tom Allyn Brook, a Thames River tributary and therefore a component of the **Waters of the United States** protected under the Act**.** Parenthetically, any citizen, municipality chartered under Connecticut statute, or organization has standing in the federal courts to enforce both said Acts.
- Conceptual drawings in the application illustrate battery storage and electrical converters at the base of a steep slope, on a level surface, i.e., millions of dollars of electrical equipment in a temporary **lake** after each heavy rainfall.
- No calculation methodology provided for quantification of the total yards of stone to be extracted, and the quantity of stone dust thus produced as a resulting byproduct.
- No calculation methodology for the volume of soil to be removed or methods of preventing its toxic content of **arsenic** from leaching into environmentally sensitive areas.

- Contradictory analyses - differing by **over an order of magnitude** - of the arsenic content of the bedrock. Which analysis is the Commission supposed to believe?
- No quantification of the arsenic content of the **soil** (which is a function of the underlying bedrock) to be removed.
- No mention of **radon**-producing **uranium** in the bedrock and its potential impact on local wells and the necessity of pre- and post-blasting **well <u>and</u> basement** testing.
- No mention of the methodology to be used for well sampling.
- No mention of the need for **annual** well tests and home inspections.
- No mention of the **disinfection protocol required after a well is uncapped.**
- No quantification of the total silica and arsenic quantities released into the atmosphere.
- No site plan acknowledgement of the Cerveny acquisition or indication of its intended use. It strains credulity that the almost six acres would not be added to the 40 being quarried (not excavated).
- **No acknowledgement of the requirement to close RT 12 during blasing, or the impact on traffic**, an enumerated concern for a SUP.
- No canvassing of the area for asthmatics, PTSD individuals, pulmonary diseased, or shift workers sleeping during the day, etc. who will be profoundly negatively impacted by dust and noise.
- No site plan provided of quarry benches and how vehicles wll access them for landscaping, or how soil will be retained to prevent erosion. The lowest benches will collect all of the soil runoff from those above.

An obvious concern flagged in the HMMH analysis has gone unaddressed:

> "The Pheasant Run Condominium community is at an elevation more than 130 feet above the developed part of the project site, so the area will have **clear sound paths** from the operation to the homes."

- No explicit mention of how (obviously by **hydraulic hammering**) Phase 5 *severing of bedrock* (*i.e.*, quarrying) will be accomplished now that the applicant has agreed not to use blasting for said Phase.
- No sound analysis regarding **hydraulic hammering** which is far more **continuous** than once or twice weekly blasting. And at 126dB, it is a significant concern.
- No analysis of the traffic tie ups on RT 214 if the expert's suggestion for the interchange with RT 12 is followed.
- No analysis of the traffic patterns on RT 12 if the speed limit is lowered to 35 MPH, if the traffic expert's suggestion is implemented.
- No plan to investigate **all** the overburden to be removed for the archaeological evidence contained in that soil.
- No listing of specific state and federal Clean Air and Clean Water Act permits which will be required. Under the National Historic Preservation Act, **no federal permit may be issued** if it would lead to the destruction of a property listed, or eligible for listing, on the National Register of Historic Places. Mount Decatur, the entire mountain, is listed on the Connecticut Register of Historic Places and is clearly eligible for the national designation.
- Insufficient mention of bonding and other enforcement and penalty mechanisms. Bonding for site restoration, but not for impacts to adjacent properties? If pre-blasting testing and inspections are proposed, this is an admission that damages could result. Based on the blasting subcontractor's history, is this a recipe for ruinous litigation costs imposed on homeowners? An/or their inability to secure insurance if they bring claims for damages the blasting contractor refuses to accept responsibility for?
- No analysis of the impact of stone dust on local electrical infrastructure, as brought to the attention of the Commission by Mr. Stern. [Reference the exhibit on the North Adams, Massachusett substation

issues.] If the Route 12/Whalehead Rd. substation is compromised, that would constitute an uncompensated regulatory taking from Eversource. Under Knick v. the Township of Scott the town could be on the hook for millions in damages from that alone, let alone the potential $18 million in depressed property values (on the Ledyard side of the river alone) that Mrs. Kelly conservatively calculated.

- No analysis of the potential for blasting to vibrate loose boulders positioned above the Chapman Lane properties, including the Methodist church's playground.
- No mention of necessary alterations to the town's FEMA-required **Natural Hazard Mitigation Plan**, or the **regional plan drafted by SECCOG**, in the event blasting disrupts gas, water, and/or electrical infrastructure; or breaches the integrity of any American Styrenics tanks.
- No vibration analysis of the potential to rupture the American Styrenics tanks within hundreds of feet of the blast zone.
- There has been **no financial analysis of the total lost tax revenues from property owners receiving tax assessment reductions**.

Exhibit #238 from Kyle Morris:

> This quarry or "quarry-like" application stands as a significant threat to the existing residents of Gales Ferry, with the potential of significant loss of property value of 20-30%. Summing all properties impacted equaling an estimate of . . . million dollars of loss . . . It is expected that **citizens will request property value reassessments**, impacting property tax revenue, which will surely **greatly outweigh any potential tax revenue** from this proposed operation.

https://eregulations.ct.gov/eRegsPortal/Browse/getDocument?guid=%7B10A5E155-0400-C742-8E80-0E3AD5E2736A%7D

Connecticut blasting regulations require warning signs on adjacent highways, which has not been mentioned to the commission.

> Sec. 29-349-213. **Warning signs**
> During the period of any blasting operation which is being initiated electrically, the blaster, contractor, or person in charge shall cause signs to be erected on all adjacent highways at a point 350 feet from the blasting site to warn motorists not to use two-way radios. These signs shall be placed on the road just prior to the loading of the holes, and shall be removed immediately after the blast is completed.

No bonding or other mechanism to fund WPCA's required supplying water to residents with damaged wells. See Baldwin HIll **exhibit #8**:

> "**Although** the application states that there is no impact that blasting has on local wells, it has come to our attention that a well at 1347 Baldwin Hill Road has gone dry and the residents (Kyle Singleton family) must use public or friend's shower facilities and use bottled water for drinking and cooking activities for over a year. Now it is not the intention of the commissioners to accuse the blasting activities to the well water loss but it seems reasonable that a formal study of the geology and water table in the area might indicate such an impact.
>
> The WPCA has been working with Groton Utilities to determine if city water can economically be installed to 1347 Baldwin Road. There is a water main located approximately 200 feet on the town road which is estimated to cost about $80,000 to install. The WPCA is pursuing grants to facilitate the cost - but this takes time - possibly years - to receive a grant. The WPCA is also working with adjacent neighbors seeking a utility easement to install a 2-inch line to the property with an estimate of $20,000 to install. It should be noted that due to the existing topology a drilling rig cannot reach or be set up to drill a well.

There may be other solutions to this problem, but **the commissioners wanted to put into the public record the effect blasting might have on surrounding wells and the impact this might have on the town's responsibility** (DPH requirements) to provide city water as a result of well failure."

Major deficiencies dating to the Planner's November 2023 interrogatories and January 2024 concerns remain unsatisfactorily addressed, e.g., no mapping of the surrounding wells. It does not take a year to determine well locations.

https://ledyardct.legistar.com/View.ashx?M=F&ID=12563918&GUID=183F62A3-EC65-4C53-83FA-8968AF3FBCD6
Exhibit 67 January 9, 2024:

Planner: For this particular application abutting structures **and wells** should be identified as well.
Response: Abutting and other nearby structures are now shown on the Property Map, Zoning, And Adjacent Features map on the Cover Sheet as well as called out on drawing C-2, Existing Conditions Plan. **We are continuing to gather information on the location of wells on the abutting properties.**

[The Commission is still waiting for said information.]

https://ledyardct.legistar.com/View.ashx?M=F&ID=12609849&GUID=EE4654BD-2943-43D7-B4F9-A866A230A747
Exhibit 70 January 11, 2024:

Planner: On Sheet C-1 the narrative speaks about sweeping the construction site weekly. Obviously, that cannot happen - and should not happen as **it will just create dust**. Not sure why it's even in there. **This is not a construction site** [it] is an excavation site/rock **quarry** site.
. . . For this particular application abutting structures, **water lines and wells** should be Identified. Revised Plan shows **some** of the structures nearby. Houses on Anderson Road are not shown - nor are the condos. **Only one well shown**.

No viable **enforcement mechanism** for violations of regulations/conditions and no stipulation of the violations which would result in rescinding the Special Use Permit. A SUP is a **contract**, and as Baldwin Hill proves, failure to include grounds for revocation guarantees chaos. **The Baldwin Hill permit is woefully negligent**. Unlike other local towns' quarry permits, it does not stipulate violations which would constitute reasons for revocation. Salem recently revoked a quarry permit when the applicant was found to have violated its stipulations. The Baldwin HIll permit has no such clauses, meaning the town would need to engage in litigation to enforce it.

CHANGES FROM PREVIOUS PROPOSAL

- Inverters and battery storage now placed on a site plan, rather than nebulously alluded to in PowerPoint slides.
- Goman & York analysis now claims warehouses will be built. Which is it?
- Where did Goman & York obtain this information from, which has yet to be shared with the Commission?
- As outlined below, the fatuous reasons for why **silica dust** will supposedly not enter the air has changed from the 2023 application to the 2024 application.
- The 2023 application was accompanied by an **extensive geological report** as an exhibit. That exhibit did not accompany the 2024 application.

GEOLOGICAL SOPHISTRY

December 2023: Affinity of feldspar to bind quartz (silica) particles will supposedly keep silica dust from escaping into the atmosphere.
September 2024: The relatively large grain size of the quartz components of the bedrock will supposedly prevent aerosolization.

The **November 22, 2022 geological report** is no longer submitted by the applicant as an exhibit for the current application. [Exhibit 11 for the first hearing] The drill hole logs recorded a **mud seam** and **fractures** — potentially creating a risk for flyrock generation and for accommodating water bearing structures that may be supplying Chapman Lane wells. The most dangerous flyrock, traveling the furthest distances, is generally produced as a result of rifling, when a charge is set off at one end of fracture or void, and loose rock in the void or fracture is expelled out the opposite end.

References to a **putative local water table**, supposedly around the level of the Thames River surface, are absurd in the context of Chapman Lane wells, which are drilled 300 to 400 feet deep through solid rock to allow sufficient depth for water inflow. These wells are not reaching down to an imaginary aquifer/water table.

Margaret LaForest, testimony on December 12, 2024 1:27:40

> I've reviewed several public comments expressing concern with air quality and characteristics of the **rock material proposed for excavation**. [*Rock material proposed for excavation* is another term for quarrying.] I think it's important to clarify that some published articles referenced about other operations and their rock makeup aren't comparable in the opinion of GFI's consultants to those at the subject site. The geologist for this specific site, and the lab test results illustrated this. Jeff Slade [who only has a bachelor's degree] senior geologist Continental Placer/Adirondack Geological Services, tested samples and found no acid rock drainage [an **irrelevant distraction** from the silica (quartz) and arsenic present], . . . R. J. Lee Group performed a more sensitive detection laboratory analysis of rock sampling, evidencing **the fact no arsenic was detected**.

[Because the testing methodology was insufficiently sensitive. Is not the USGS a more credible reference, when the intent of their testing was to actually find the presence of arsenic?]

LaForest, **Exhibit # 231**:

> ***Jeff Slade, PG, Senior Geologist, Continental Placer/Adirondack Geologic Services*** EX# 2, EX# 75, EX# 76, EX# 77 Pages 11-18, EX# 171-2. NO Acid Rock Drainage (ARD), Arsenic, Sulfur or Sulfide minerals (pyrrhotite or chalcopyrite).
>
> ***RJ Lee Group*** performed a more sensitive detection geologist analysis of rock sample evidencing the fact NO Arsenic was detected at the 1.84 parts per million sensitivity level. EX# 138-2, 155, 171-2

As Mr. Fiore pointed out, **Exhibit #187**, arsenic must be measured in parts per **billion, not million**. **It is not true that no arsenic is present**, only that none was detected using an **inappropriate** testing methodology. The Connecticut State Geologist has documented that the alaskite gneiss found on the property contains elevated arsenic levels. Only relatively small amounts of arsenic are dangerous.

Verdantas study found to be comprehensively and largely conservatively prepared, addressing all pertinent air quality regulations. It used the correct dispersion model and representative meteorological data, and did not find any inaccuracies in the development of modeling or emission parameters.

When Attorney Carroll questioned Suzanne Pisano, of Verdantas, about her study, and inquired regarding silica dust (a term she carefully avoided mentioning), Attorney Heller jumped up and insisted that was a geological question, which had been answered by Mr. Slade. He apparently meant the geological fairytale that somehow silica dust will somehow not magically enter the air after the rock (which is loaded with quartz) is drilled, blasted, crushed, and transported hundreds of yards across the property. Only in an alternate universe is a question regarding dust, not a question for an air quality, dust dispersion expert.

LEGAL SOPHISTRY

During his December 14, 2023 presentation, Attorney Heller showed an image of the Bozrah quarry as "an excellent example of what the future can bring." He also made the statement below.

". . . the fact cannot be ignored that anyone residing in the "immediate area" purchased with the **constructive knowledge** of the industrial operations on the GFI property."

> ***Constructive***:
> "That which Is established by the mind of the law in Its act of construing facts, conduct, circumstances, or instruments; **that which has not the character assigned to it in its own essential nature**, but acquires such character in consequence of the way in which it is regarded by a rule or policy of law; hence, inferred, implied, made out by legal interpretation." *i.e.*, a **legal fiction**

". . . this project will create **no further impacts** to the "immediate neighborhood" than those which it has encountered over the last 70 years from the heavy industrial use of the GFI Property."

https://en.wikipedia.org/wiki/Bhopal_disaster
Dow Chemical could have potentially killed thousands with the 1999 combustion of a methyl isocyanide tank of the now GFI-owned property, which required evacuation of Montville and Ledyard neighborhoods. No information has been provided as to whether that compound is still stored on the property. It is used in the production of certain plastics, which is ongoing on the property. Or regarding the hazardous nature of any of the other dangerous compounds present. Union Carbide's 1985 release of methyl isocyanide in Bhopal India killed thousands and injured hundreds of thousands, the worst industrial accident in history. Methyl isocyanide is not only extremely toxic, but highly explosive. Blasting in the "immediate area" of tanks containing substances hazardous enough to require evacuation across a vast neighborhood is **reckless**.

No information has been provided regarding the contents of these tanks or their potential danger. We know the contents are deadly due to the town's evacuation plans.

No attempt to quantify or define the "immediate area" referenced in the zoning regulations. According to the state of Maine, 1,000 feet constitutes the radius of the zone around blasting which should be provided notice of impending blasts. Should this distance not also qualify from pre-blast home surveys? The applicant is offering 750 feet, with the opportunity for property owners between 750 and 1,000 feet to have "a conversation." What might be an "immediate area" related to an application for a carwash becomes considerably expanded in the context of a bedrock quarry application. Maine Statute:

Sec. 11. 38 MRSA §490-Z, sub-§14, ¶O is enacted to read:

O. Prior to blasting, the owner or operator shall develop and implement a plan that provides an opportunity for prior notification of a planned blast for all persons located within **1,000 feet** of the blast site. Notification may be by telephone, in writing, by public notice in a newspaper of general circulation in the area affected or by other means identified in the plan. The plan must be in writing and available for inspection by the department.

Maine statute also prescribes the distance between quarries and public water supplies. Groton Utilities has calculated the distance between the blasting and their Route 12 water main servicing thousands of people as being **under 100 feet**.

Sec. 5. 38 MRSA §490-D, sub-§3, ¶C, as amended by PL 1995, c. 700, §24, is further amended to read:

C. Separation must be maintained between any affected land and any public drinking water source existing prior to the filing of a notice of intent to comply under section 490-C as follows:

(3) **For systems serving a population of more than 1,000 persons, the separation must be 1,000 feet**;

Maine statutes require a **½ mile radius** for blasting surveys, while GFI is only offering 750 feet.

Title 38, §490-Z: Performance standards for quarries

F. A preblast survey is required for all production blasting and must extend a **minimum radius of 1/2 mile from the blast site**. The preblast survey must document any preexisting damage to structures and buildings and any other physical features within the survey radius that could reasonably be affected by blasting. Assessment of features such as pipes, cables, transmission lines and **wells and other water supply systems** must be limited to surface conditions and other readily available data, such as **well yield and water quality**.

The Blasting Guidance Manual of the U.S. Department of Interior's Office of Surface Mining and Reclamation and Enforcement also requires a **½ mile radius** for pre-blast surveys.
https://files.dep.state.pa.us/Mining/BureauOfMiningPrograms/BMPPortalFiles/Blasting_Research_Papers/OSM%20Reports/OSM%201985%20Blasting%20Guidance%20manual.pdf

REQUIREMENT BY LAW: Unlike many other sections of the OSMRE regulations, the requirement to carry out pre-blast inspections of properties within one half mile of the permit is specified in the original Public Law 95-87, August 3, 1977, (Section 515(b) (15)(E)). The Act states the "The Regulatory Authority .... shall include provisions to provide that upon the request of the resident or owner of a man-made dwelling or structure **within one-half mile** of any portion of the permitted area the applicant or permittee **shall conduct** a pre-blast survey of such structures and submit the survey to the regulatory authority **and a copy to the resident or owner** making the request"

Commissioner Ribe asked if MSHA compliance is typically required for a site characterized as an excavation major. Attorney Heller replied: "Anytime material is **excavated and processed** it comes under MSHA regulation." **The reply was non-responsive to the question.** If this was an accurate reply to the question, every house foundation excavation would require federal oversight. Which is absurd. If by "excavated **and processed**" this refers to a quarry or surface mine, the reply is true.

https://arlweb.msha.gov/regs/complian/ppm/pmvol1a.htm

I.4-1 MSHA/OSHA Interagency Agreement

MSHA and OSHA have entered into an agreement to delineate certain areas of inspection responsibility, to provide a procedure for determining general jurisdictional questions, and to provide for coordination between the two agencies in areas of mutual interest. MSHA has jurisdiction over

operations whose purpose is to extract or to produce a mineral. **MSHA does not have jurisdiction where a mineral is extracted incidental to the primary purpose of the activity. Under this circumstance, a mineral may be processed and disposed of, and MSHA will not have jurisdiction since the company is not functioning for the purpose of producing a mineral**.

Operations not functioning for the purpose of producing a mineral include, but are not limited to, the following:

1. key cuts in dam construction (not on mining property or used in mining);
2. public road and highway cuts;
3. tunnels
    a. railroad
    b. highway
    c. water diversion, etc.; and
4. storage areas
    a. gas
    b. petroleum reserves
    c. high and low level radioactive waste.

*The question of jurisdiction in these and similar types of operations is **contingent on the purpose and intent** for which the facility is being developed.*

103(a) Mandated Inspections

Section 103(a) of the Act requires a minimum of four inspections a year for underground mines and a minimum of two inspections a year for **surface mines**.

The applicant has informed us that MSHA will inspect the operation twice a year. The application is therefore for a **surface mine.** The same as Baldwin Hill. Whether an application for a quarry or a surface mine (which are the same thing), neither is allowed under Ledyard regulations. Baldwin Hill was supposedly a pre-existing use, grandfathered in.

A separate exhibit contains the relevant text from the May, 2024 New London Superior Court decision in **Blue Camp CT LLC** vs. Preston Planning & Zoning Commission. The appeal of Preston's denial was denied by the court, and the subsequent appeal of that decision was summarily dismissed by the appellate court in September. It provides **extensive caselaw** for why such contentions as claiming the testimony of any expert must be accepted as gospel, or that Internet research must play no role in this process, are absurd.

The Blue Camp CT LLC (an entity headquartered on Stephen Decatur Highway in Ocean City, Maryland) appeal of its denial by the Preston Planning & Zoning Commission is a roadmap to dismantling the sorts of legal sophistry being replicated in the GFI application. A zoning application adjudication is not a trial in a court of law. The public, applicants, and commissioners are permitted to liberally acquire all pertinent facts and information. As is the case with any adversarial contest, some of the information elicited will directly contradict other information or testimony. [For example, even the GFI principals and experts have contradicted each other regarding whether the permit application is for a quarry or an "excavation."] Courtroom rules of evidence regarding what a jury is permitted to see have zero applicability in land use contexts. Commissioners are charged with adjudicating the **credibility** of all testimony and exhibits.

PREVARICATIONS & FAIRYTALES

- Depiction on a site map of all Chapman Lane homes as supposedly being serviced by municipal water. At least four of these homes are on wells. It could prove significantly expensive is the WPCA were to be responsible for rectifying those wells in the event they become compromised.
- Depiction of potential battery storage and electrical conversion facilities supposedly related to offshore wind power generation. The electrical cables coming ashore from such installations are extremely high voltage (over 400kv) and must be buried 5 to 6 feet below the seabed to avoid impacts. There is no practical means to run such cables up the dredged channel of the Thames River to the GFI property.
- Referring to Baldwin HIll as an "**excavation**" rather than a classic example of a dysfunctional **quarry**, complete with MSHA citations/fines.
- Maintaining that Internet research is not to play any role in a **public** hearing process. Public hearings serve as a search for the truth, not an opportunity to put on blinders. If only expert testimony is relevant, **why is the public allowed to participate in public hearings**? This represents an intentional conflation of the rules pertaining to jury trials and those for public hearings.
- The enumerated missing information documented on the previous pages are of course examples of **prevarication by omission**.
- **November 16, 2023**, the Planner asked the applicant for specifics regarding: "*that all proposed uses and structures would be consistent with future development as identified and envisioned in these Regulations and the Ledyard Plan of Conservation and Development*."
  January 9, 2024 response: "*This project satisfies the economic development goals enunciated in Section VII of the 2020 Plan of Conservation and Development by creating prime industrially zoned land shovel ready for future development.*"
  This is not an accurate depiction of the Section 7 of the POCD, which states:

  > The challenge will continue to be to encourage commercial and mixed-use development **where appropriate**, while **protecting the quality of life, property values, and the environment** of the **existing residents**.

"A property owner has a claim for a violation of the Takings Clause as soon as a government takes his property for public use without paying for it. . . . The property owner may sue the government at that time in federal court." — Chief Justice Roberts

Knick v the Township of Scott - 2019
https://www.supremecourt.gov/opinions/18pdf/17-647_m648.pdf
Held:

> 1. A government violates the Takings Clause when it takes property without compensation, and a property owner may bring a Fifth Amendment claim under **§1983** at that time. . . .
> (b) This Court has long recognized that property owners may bring Fifth Amendment claims for compensation as soon as their property has been taken, regardless of any other post-taking remedies that may be available to the property owner. . . .
>
> Inverse condemnation is "a cause of action against a governmental defendant to recover the value of property which has been taken in fact by the governmental defendant." . . . Inverse condemnation stands in contrast to direct condemnation, in which the government initiates proceedings to acquire title under its eminent domain authority. . . .
>
> The Fifth Amendment right to full compensation arises at the time of the taking . . .
> a property owner has a Fifth Amendment entitlement to compensation as soon as the government takes his property without paying for it . . .
>
> because a taking without compensation violates the self-executing Fifth Amendment at the time of the taking, **the property owner can bring a federal suit** at that time. . . . someone whose property has been taken by a local government has a claim under **§1983** for a "deprivation of [a] right[] . . . secured by the Constitution"

https://www.**shipmangoodwin.com**/insights/us-supreme-court-reopens-the-federal-courthouse-door-to-property-owners-takings-claims.html

> The decision points out repeatedly that the Takings Clause of the federal Fifth Amendment is part of the Bill of Rights, and that takings claims should be allowed to be brought in federal court in the same manner as claims raising freedom of speech, protection against unreasonable search and seizure, and other cornerstone constitutional protections . . .

> The Knick decision, then, **will make a big difference going forward in property rights cases** in several ways. Overall, when state agencies and regulators regulate the use of land so severely as to substantially **reduce** or extinguish its value, or impose a condition that is not logical or proportional, asserting that the public interest allows them to do so without payment of just compensation, **the standard for litigating such claims will now tilt decidedly back toward property owners** . . . . **State and local governments will now have to defend against these claims in federal court.** . . . Property owners will bring more claims for takings, because it will be faster and less expensive to proceed directly in federal court. And **the property owner will now have the ability to recover attorneys' fees** if it prevails.

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42 U.S.C. **§ 1983** (the Civil Rights act of 1871) provides plaintiffs:

- Compensatory damages
- Punitive damages
- Attorney fees

The **municipal government** and/or the **individual officials** responsible for Takings Clause violations are those who become defendants if impacted property owners bring a federal §1983 action.

Press and government accounts relating Maine Drilling & Blasting's performance

https://voshaboard.**vermont.gov**/sites/vosha/files/documents/Decisions/VRB791_Decision_MaineDrillingAndBlasting2002.pdf

> On or about May 22, 2001, Chris Vollaro, a senior industrial hygiene officer with the State Of Vermont, passed the drilling site on his way home from work and observed a **large cloud of dust around two employees**. At the time, the state of Vermont had a special program on the **dangers of silica** in construction and had instructed all employees to remain aware of any possible violations. . . .
>
> 4. On May 29, 2001, Mr. Gosbee returned to the location where drilling was occurring. He met with two employees of the Respondent, Roger Hartshorn and Joe Deschamps, who voiced no objections to his continuing his investigation.
> 5. Before leaving the office, Mr. Gosbee had pre-calibrated his sampling pump, and no questions were raised about the calibration of the equipment.
> 6. Mr. Gosbee then attached the sampling unit to employee Roger Hartshorn who was Operating the drilling machine and was the most exposed to potential silica. The sample was obtained over the course of a full workday, a total of 484 minutes.
> 7. At the same time, Mr. Gosbee askedMr. Hartshorn what he knew about silica and the hazardous materials with which he was working. **Mr. Hanshom did not state that he was aware of silica as a hazard.**
> 8. **Mr. Gosbee asked Mr. Hartshorn whether he knew the signs and symptoms of exposure to silica, and Mr. Hartshorn replied that he did not**
> **9. Mr. Gosbee learned from Mr. Hartshorn that the company had provided him generic training about hazards in the workplace, but not training specifically about the hazards of silica.**

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https://www.vtcng.com/stowereporter/archives/blast-hurled-rocks-almost-700-feet/article_9c3f1729-96a8-5398-95a5-c5ca9f1610a4.html

> A negligent blast at a Morrisville mine **hurled rocks almost 700 feet through the air**, and could have caused serious injury or **death**.
>
> That is the finding of the U.S. Mine Safety and Health Administration, after investigating an incident in April on Cochran Road in Morrisville.
>
> **The federal government issued two citations to Maine Drilling and Blasting**, the company hired by Dale E. Percy Inc. of Stowe to set off explosions to break up rock formations in the mine.
>
> In his report, federal inspector Zane Burke said 25 rocks from the mine blast were found scattered from Pine Crest Trailer Park to the Morrisville town garage; some had been flung almost 700 feet.
>
> **The rocks "were measured to be 4 to 11 inches long**," Burke said, and were found on the lawns of several mobile homes, in front of parked vehicles there, and even on top of the town garage roof, **hundreds of feet away.**
>
> "**Blasting mats were not used to prevent the fly rock. This condition allows for a fatal accident to occur**," Burke wrote.

Maine Drilling was instructed to reduce the power of its charges and to use blasting mats in any future explosions at the mine.

According to the Maine Drilling and Blasting Web site, mats are sometimes used to cover a blast site "to prevent rocks from flying. A typical mat is made of recycled tires tightly compressed with steel cable. A 12-foot by 12-foot mat weighs about 6,000 pounds."

In his notes, Burke said **Maine Blasting officials told him blasting mats were not used "because it wasn't bid for mats**."

Chip Percy of Stowe owns the mine on Cochran Road.

According to Burke's notes, Mark Billings, **the superintendent from Maine Blasting in charge at the Percy Mine, claims Percy told him "price was an issue**."

Company will appeal

Mitchell Green, vice president of Maine Drilling and Blasting, said in an interview that the errant blast was an "anomaly" and the result of "unforeseen" circumstances.

"On the day of the incident, we had designed a blast that was very appropriate. We did not feel that mats were called for in this case," he said. "We had established that it was safe."

Green said the blast was designed to shoot rock into a large open face in the quarry, but **because of unseen vertical "seams," or cracks in the rock, the rocks didn't shoot forward into the rock face as expected, but up into the air.**

Green said Maine Blasting employees were stationed at the entrance of the mine, on Cochran Road in front of the trailer park, and at the town highway garage, and traffic on the road had been stopped.

"The fact that our people were standing right in front of the park, securing the area, supports the conclusion that the design we put together was safe," Green said.

He said most of the fly rock landed in the grassy area between the mine and the town highway garage.

"A very small rock hit in the road and skipped onto a lawn," he said. "Our people were right there. Those are the facts."

As for Burke's report, Green refused to call the inspector's accusations false, but did say the company will appeal the citations.

"Within that process, we will give our opinion, and out of that process will come the finding of fact," Green said. "I'm not saying they are wrong and we're right; we just have a difference of opinion."

Percy said in an interview after the blasting incident that mats weren't used because they were not needed.

"**We never mat it; we've never been required to mat it**," he said. "If we were blasting right next to a car or house, you would, but we're 450 feet away from the nearest trailer. That's a long way. "

Burke reported finding rocks as far away as the entrance to the town salt shed, **764 feet from the mine.** He said that he found rocks on the front lawns of several mobile homes, and a rock that went 24 feet past one trailer and landed in its back yard.

To find a violation, the federal agency "has to show that the company had reason to believe that there would be fly rock coming off the mine site," said Jim Petrie, Northeast district manager of the Mine Safety Administration. "We look at all the evidence, the geological site, the particulars of the blast, prior incidents, how much powder they used, if there were cracks in the base of the rock. That all contributes to it.

"We will issue a violation if we feel like they knew there was a partial chance the blast would create fly rock and they failed to notify individuals in the area."

What happened?

Kay Shedd said she was sitting in her mobile home at Pine Crest Trailer Park in Morrisville that late April day when "**an awful bang" shook her entire house**.

Milliseconds later, she said, she heard another bang; a rock hit the side of her mobile home with such force that two pictures came crashing down off the wall.

"What if a car was driving by, or a kid was riding a bicycle or walking by? What then?" Shedd asked. "I don't think this is good, not at all. This is dangerous and it isn't anything we should have to live with."

Other residents agreed, and more than 70 of them signed a petition to the Morristown Select Board, drawing its attention to the danger.

Federal authorities were contacted, and within a few days Burke drove up from his Albany, N.Y., base to investigate.

Burke talked with park residents, including Sonny McFarlane, who organized the petition and contacted local authorities.

"I'm not so much worried about damage to the house as I am to humans. There are kids walking up and down the street. One of these times, if they keep it up, somebody is going to get hurt," McFarlane said in an interview after the blast.

He said the problems started last year when **a stone "a little smaller than a grapefruit" flew over from a blast, and hit McFarlane's companion in the left side, sending her to the hospital,** he said.

After the April blast, **Percy was adamant that park residents were exaggerating what really happened.**

Told of allegations that rocks from the blast had hit homes, Percy said, “That’s a complete lie. These people are blowing this way out of proportion. They are carrying on about nothing; this isn’t a great big deal.”

He added: “I haven’t seen any evidence that what they’re saying is true. This year, we had five (employees) standing around the trailer park for verification of what went on (during the blasting). We know what went on, and what didn’t go on. We’re talking one or two small stones.”

Percy said one stone — about the size of a quarter — did hit Cochran Road, which separates the park from the blasting site, and skidded across the road onto a lawn, but that was it.

In a written citation, **Burke said three traffic spotters were standing on Cochran Road, 450 feet east of the blast site. He considered that a safety violation, because the law says all workers not protected by a blasting shelter must “leave the blast area.”**

In this case, “the **fly rock** was measured with a GPS device to have been **blasted over 686 feet** from the blast site,” Burke wrote, which would put Cochran Road, just feet from the trailer park, in the blast area.

Failure to use mats “allows for a fatal accident to occur,” he wrote.

He also reprimanded blasters for failing to “warn or evacuate persons in the Pine Crest Mobile home park and households adjacent to the park.”

In an interview, Percy told the federal inspector that “no such thing took place,” Burke wrote. **“He said it was a waste of the (government’s) time to send us up here, that we shouldn’t be the ones who reprimand the blaster, that he should.** ”

Asked about blasting damage in the past, **Percy “said ‘There was damage in the past to someone’s car, but that’s why (I have) insurance**,’” Burke wrote.

Burke said Percy told him no damage was reported in the trailer park, but “I informed him (that) I searched the park and found damage to one trailer. He said, ‘Ah (expletive),’” Burke wrote.

Green, of Maine Blasting, said his company is not taking what happened lightly.

“This incident is serious to us; we don’t look at this as run-of-the-mill by any means,” he said. “**It is important to note there were five more subsequent blasts after the first without incident and there were no mats**.

“In our own experience, (incidents like this) are very rare. We cover seven states, so we have a lot of exposure. There are thousands of projects a year for this company and they are all done very successfully.”

The federal agency is familiar with Percy’s mine. In 2004, Percy got six citations, including one for improper use of equipment and machinery. In 2005, Percy was issued three citations. In all, the company has been fined just over $900 for violations at the Cochran Road mine.

In an interview, Percy said the blasting is over for the time being, but there may be more of it later this summer.

Danger from flyrock

On September 24, 2008 in South Burlington, the **Maine Drilling and Blasting** Co. detonated a blast that **threw flyrock several hundred yards and resulted in damages estimated to be a million dollars to aircraft, vehicles, buildings and grounds** at the Burlington International Airport. Miraculously no one was injured. The same company had a blast go awry in Raymond, NH, on April 25, 2005, doing **damage to buildings and vehicles over 1,000 feet away**.

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https://www.msn.com/en-us/news/us/taunton-quarry-blast-showers-homes-with-rocks-raises-safety-concerns/ar-BB1m4pLQ
https://turnto10.com/news/local/mistimed-taunton-quarry-blast-showers-homes-with-rocks-raises-safety-concerns-rhode-island-southern-new-england-may-8-2024

Taunton quarry blast showers homes with rocks, raises safety concerns

by MOLLY LEVINE, NBC 10 NEWS Wed, **May 8th 2024**

TAUNTON, Mass. — **A quarry blast in Taunton sent rocks raining down into nearby residents' backyards**.

A preliminary investigation suggested it was caused by a mistimed detonation.

"It was very loud, and it scared the kids," said Jennifer Elsinger, who lives half a mile from the Holcim quarry on Fremont Street. She said a rock landed just feet from where her neighbor was gardening outside. **"I was blown away at the size of the rock**," said Elsinger. The mother and father of five have concerns, as their **children** often play in their backyard.

In an email letter from a licensed blaster for **Maine Drilling and Blasting**, he notified the Taunton Fire Department that he shot a quarry blast at the Holcim site that was "overly active," causing flying rocks landing in two yards on Fremont Street on April 29.

The blaster wrote in his letter that, "the timing sequence used did not allow adjacent holes in the blast to move with horizontal relief as intended and instead caused vertical ejection."

The Taunton Fire Department released a statement.

No injuries were reported, but Elsinger said it's a mistake that could have been deadly.

"It's unpredictable, they can try their best to mitigate and keep things under control, but accidents are accidents," she said.

Taunton Mayor, Shauna O'Connell, said the fire department put procedures in place to ensure such an incident does not occur again.

A permit was re-issued as of May 6, and the fire department said they'll continue monitoring blasting operations.

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https://turnto10.com/resources/pdf/b96eb952-58c8-47a3-b5a5-ef2399386fc0-TauntonFDLetter05.02.24Signed.pdf

YOUR TRUSTED BREED
making it happen

Captain Bastis
Fire Prevention
Taunton Fire Department 141 Oak St. Office #17, Taunton, MA 02780
RE: Fly rock, Holcim NER - Taunton Quarry

Dear Captain Bastis,
On Monday April 29th, **2024**, at approximately 11:00 AM. I, Jason Guilmette, licensed blaster for Maine Drilling and Blasting shot a quarry blast that was overly active resulting in **a fly rock event where rock left the quarry** property landing at an adjacent neighbor at 175 & 179 Freemont St. Taunton, Mass. This written report is required by 527 CMR 1 Chapter 65.9.14 as a follow-up to my conversation with Scott Macone April 29, 2024, and Captain Bastis on May 1st, 2024 both of Taunton Fire Prevention.

We believe the cause of **this fly rock event** was due to the sequence of timing of the blast. The timing sequence used did not allow adjacent holes in the blast to move with horizontal relief as intended and instead **caused vertical ejection**. I will be working with our Technical Services Department on a timing sequence to avoid this on future blasting.

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https://poststar.com/news/local/maine-contractor-charged-with-fraud-over-forged-signature/article_f3381d9a-1823-11df-b2fa-001cc4c03286.html

Maine contractor charged with fraud over forged signature

2023-11-06

FORT EDWARD -- **A Maine-based contracting company has been indicted on charges that accuse it of submitting a forged contract to a Supreme Court justice** in a lawsuit over a construction Bill. Maine Drilling & Blasting LLC., which has an office in Hartford, faces four charges, including **felony counts of forgery and offering a false instrument for filing**. It also faces misdemeanor counts of falsifying business records and offering a false instrument for filing. The charges stem from a lawsuit Maine Drilling & Blasting filed in September 2008 against Bolton contractor Don Kingsley Excavating LLC and a Schenectady County contractor over work Maine Drilling & Blasting did at the site of the King's Quarters townhouse development in Kingsbury.

As part of that lawsuit, Maine Drilling & Blasting submitted a contract to the court that bore what was supposed to be a photocopied signature of Don Kingsley, owner of Don Kingsley Excavating. But Kingsley claimed that signature was forged and that Maine Drilling's agreement was with CW Custom Builders only.

Court records allege that a copy of Kingsley's signature was allegedly taken from another document and attached to the contract. Without a contract with Kingsley, Maine Drilling & Blasting would not be able to sue the Bolton company.

That led to a Washington County grand jury investigation and subsequent **criminal charges that accuse Maine Drilling & Blasting of fraud**. Investigators could not link the **forgery** to a specific person, but concluded someone at the company was responsible, court records show. The company has pleaded not guilty to the charges. An affidavit from J. Michael Welch, the then-manager of Maine Drilling & Blasting's western division, which includes Washington County, shows he told the court he did not affix Kingsley's signature to the contract, nor did he know who did.

A lawyer for the company, Colm Ryan, has asked Washington County Judge Kelly McKeighan to dismiss the charges. Washington County District Attorney Kevin Kortright could not be reached for comment Friday. Ryan said he could not discuss the case Friday. The motion is still pending. A phone message left at Kingsley's office Friday was not returned.

Blocker v. Maine Drilling Blasting, 2006 Ct. Sup. 159

The plaintiffs, Robert Blocker and Serena Blocker (respectively referred to as Mr. Blocker and Mrs. Blocker), commenced this action by service of process on November 2, 2004. In the two-count complaint, each plaintiff sets forth a cause of action sounding in strict liability against the defendant, Maine Drilling Blasting, Inc. The plaintiffs allege that the defendant was engaging in an **ultrahazardous activity, i.e., blasting** activities by use of explosives, on December 27, 2002. The plaintiffs further allege that the **defendant's actions caused boulders, rocks and debris to strike the plaintiffs' home while the plaintiffs were inside**. Finally, the plaintiffs allege that the defendant's activities caused the plaintiffs to **suffer fear and emotional distress**, for which the defendant is strictly liable.

All claims for property damage in this case have previously been settled between the parties. The present action is solely for the recovery of **emotional distress damages.**

On November 10, 2005, the plaintiffs moved for summary judgment as to liability only. The defendant did not oppose this motion, and the court (McWeeny, J.) **granted summary judgment in favor of the plaintiffs** on November 28, 2005. On May 10, 2006, a hearing in damages was held before this court.

On December 27, 2002, the plaintiffs were occupying their residence at 15 James Vincent Drive in **Clinton, Connecticut**. The defendant was engaging in the blasting of rock by use of explosives across the street from the plaintiffs' residence as part of the construction of a residential home. As testified to by Todd Barrett, the defendant's divisional manager, "**something went wrong**" with the blasting, which resulted in **rocks and debris being hurled approximately 400 feet across the street** and striking the plaintiffs' residence. **The percussion of the blast, along with the rocks striking the front and top of the house, caused the house to shake and the ceiling to crack** in at least one place. Some of the debris hit the house forcefully enough to lodge in sections of the siding and gutter. This was a frightful occurrence that caused Mrs. Blocker and her daughter, who was visiting her parents, to scream aloud. The impact reminded the plaintiffs of an earthquake they had experienced in California in 1994 that had a similar effect. This previous experience, which had resulted in a diagnosis of **post-traumatic stress** disorder for Mrs. Blocker, heightened the plaintiffs' sensitivity to the blasting incident at issue in this case.

Blast hurled rocks almost 700 feet | Archives | vtcng.com

A negligent blast at a Morrisville mine **hurled rocks almost 700 feet through the air, and could have caused serious injury or death.**

That is the finding of the U.S. Mine Safety and Health Administration, after investigating an incident in April on Cochran Road in Morrisville.

The federal government issued two citations to Maine Drilling and Blasting, the company hired by Dale E. Percy Inc. of Stowe to set off explosions to break up rock formations in the mine.

In his report, **federal inspector Zane Burke said 25 rocks from the mine blast were found scattered** from Pine Crest Trailer Park to the Morrisville town garage; some had been flung almost 700 feet.

The rocks "were measured to be 4 to 11 inches long," Burke said, and were found on the lawns of several mobile homes, in front of parked vehicles there, and even on top of the town garage roof, hundreds of feet away.

"Blasting mats were not used to prevent the fly rock. This condition allows for a fatal accident to occur," Burke wrote.

Maine Drilling was instructed to reduce the power of its charges and to use blasting mats in any future explosions at the mine.

According to the Maine Drilling and Blasting Web site, mats are sometimes used to cover a blast site "to prevent rocks from flying. A typical mat is made of recycled tires tightly compressed with steel cable. A 12-foot by 12-foot mat weighs about 6,000 pounds."

In his notes, Burke said Maine Blasting officials told him blasting mats were not used "because **it wasn't bid for mats**."

Chip Percy of Stowe owns the mine on Cochran Road.

According to Burke's notes, Mark Billings, the superintendent from Maine Blasting in charge at the Percy Mine, claims Percy told him "**price was an issue**."

Company will appeal

Mitchell Green, vice president of Maine Drilling and Blasting, said in an interview that the errant blast was an "**anomaly**" and the result of "**unforeseen**" circumstances.

"On the day of the incident, we had designed a blast that was very appropriate. We did not feel that mats were called for in this case," he said. **"We had established that it was safe."**

Green said the blast was designed to shoot rock into a large open face in the quarry, but because of unseen vertical "seams," or cracks in the rock, the rocks didn't shoot forward into the rock face as expected, but up into the air.

Green said Maine Blasting employees were stationed at the entrance of the mine, on Cochran Road in front of the trailer park, and at the town highway garage, and **traffic on the road had been stopped.**

“The fact that our people were standing right in front of the park, securing the area, supports the conclusion that the design we put together was safe,” Green said.

He said most of the fly rock landed in the grassy area between the mine and the town highway garage.

“A very small rock hit in the road and skipped onto a lawn,” he said. “Our people were right there. Those are the facts.”

As for Burke’s report, Green refused to call the inspector’s accusations false, but did say the company will appeal the citations.

“Within that process, we will give our opinion, and out of that process will come the finding of fact,” Green said. “I’m not saying they are wrong and we’re right; **we just have a difference of opinion.**”

Percy said in an interview after the blasting incident that mats weren’t used because they were not needed.

“We never mat it; we’ve never been required to mat it,” he said. “If we were blasting right next to a car or house, you would, but we’re 450 feet away from the nearest trailer. That’s a long way. … “

Burke reported finding rocks as far away as the entrance to the town salt shed, 764 feet from the mine. He said that he found rocks on the front lawns of several mobile homes, and a rock that went 24 feet past one trailer and landed in its back yard.

To find a violation, the federal agency “has to show that the company had reason to believe that there would be fly rock coming off the mine site,” said Jim Petrie, Northeast district manager of the Mine Safety Administration. “We look at all the evidence, the geological site, the particulars of the blast, prior incidents, how much powder they used, if there were cracks in the base of the rock. That all contributes to it.

“We will issue a violation if we feel like they knew there was a partial chance the blast would create fly rock and they failed to notify individuals in the area.”

What happened?

Kay Shedd said she was sitting in her mobile home at Pine Crest Trailer Park in Morrisville that late April day when **“an awful bang” shook her entire house.**

Milliseconds later, she said, she heard another bang; a rock hit the side of her mobile home with such force that two pictures came crashing down off the wall.

“What if a car was driving by, or a kid was riding a bicycle or walking by? What then?” Shedd asked. “I don’t think this is good, not at all. This is dangerous and it isn’t anything we should have to live with.”

Other residents agreed, and **more than 70 of them signed a petition to the Morristown Select Board**, drawing its attention to the danger.

Federal authorities were contacted, and within a few days Burke drove up from his Albany, N.Y., base to investigate.

Burke talked with park residents, including Sonny McFarlane, who organized the petition and contacted local authorities.

“I’m not so much worried about damage to the house as I am to humans. There are kids walking up and down the street. **One of these times, if they keep it up, somebody is going to get hurt**,” McFarlane said in an interview after the blast.

He said the problems started last year when **a stone “a little smaller than a grapefruit” flew over from a blast, and hit McFarlane’s companion in the left side, sending her to the hospital**, he said.

After the April blast, Percy was adamant that park residents were exaggerating what really happened.

Told of allegations that rocks from the blast had hit homes, Percy said, **“That’s a complete lie. These people are blowing this way out of proportion. They are carrying on about nothing; this isn’t a great big deal.”**

He added: “I haven’t seen any evidence that what they’re saying is true. This year, we had five (employees) standing around the trailer park for verification of what went on (during the blasting). We know what went on, and what didn’t go on. We’re talking one or two small stones.”

Percy said one stone — about the size of a quarter — did hit Cochran Road, which separates the park from the blasting site, and skidded across the road onto a lawn, but that was it.

In a written citation, Burke said three traffic spotters were standing on Cochran Road, 450 feet east of the blast site. He considered that a safety violation, because the law says all workers not protected by a blasting shelter must “leave the blast area.”

In this case, “the **fly rock was** measured with a GPS device to have been **blasted over 686 feet** from the blast site,” Burke wrote, which would put Cochran Road, just feet from the trailer park, in the blast area.

Failure to use mats “allows for a fatal accident to occur,” he wrote.

He also reprimanded blasters for **failing to “warn or evacuate persons** in the Pine Crest Mobile home park and households adjacent to the park.”

In an interview, Percy told the federal inspector that “no such thing took place,” Burke wrote. “He said it was a waste of the (government’s) time to send us up here, that we shouldn’t be the ones who reprimand the blaster, that he should.”

Asked about blasting damage in the past, Percy "said 'There was damage in the past to someone's car, but that's why (I have) insurance,'" Burke wrote.

Burke said Percy told him no damage was reported in the trailer park, but "I informed him (that) I searched the park and found damage to one trailer. He said, **'Ah (expletive),'"** Burke wrote.

Green, of Maine Blasting, said his company is not taking what happened lightly.

"This incident is serious to us; we don't look at this as run-of-the-mill by any means," he said. "It is important to note there were five more subsequent blasts after the first without incident and there were no mats.

"In our own experience, (incidents like this) are very rare. We cover seven states, so we have a lot of exposure. There are thousands of projects a year for this company and they are all done very successfully."

The federal agency is familiar with Percy's mine. In 2004, Percy got six citations, including one for improper use of equipment and machinery. In 2005, Percy was issued three citations. In all, the company has been fined just over $900 for violations at the Cochran Road mine.

In an interview, Percy said the blasting is over for the time being, but there may be more of it later this summer.

Wallace & Ella Boyd, of Mars Hill, County of Aroostook, State of Maine

11. In the Summer of 2006, the defendant, Maine Drilling and Blasting, Inc., performed extensive blasting which not only was extremely loud and disruptive, but which caused physical damage to the Plaintiffs' property and physical injury to the Plaintiffs' enjoyment of peace. The Plaintiffs were not notified of the times of when the blasting was to occur.

12. Before the blasting and operation of the windmills, the Plaintiffs lived in areas to the north and east of the Mountain in a **peaceful, remote, quiet, serene, and visually pleasant setting**

Maine Adopts Strict Liability for Abnormally Dangerous Activities in Dyer v. Maine Drilling and Blasting, Inc

Vera Dyer's home in Prospect, Maine is thought to be over seventy-years-old and has a cement floor and foundation. In the fall of 2004, Maine Drilling gave Ms. Dyer notice that it would be blasting rock near her home as part of a construction project in connection with the replacement of the Waldo-Hancock County Bridge. Maine Drilling conducted a pre-blast survey of the Dyer home and the surveyor noted concrete deterioration in one of the walls and cracking of the concrete flooring. Ms. Dyer's son, Richard Dyer, also documented the condition of the home by videotape prior to the blasting. Subsequently, Maine Drilling "conducted over 100 blasts between October 2004 and early August 2005. The closest blast was approximately 100 feet from the Dyer home." Although Ms. Dyer was visiting Florida when most of the blasting took place, she was in the home when two of the blasts were set off and **she felt the entire house shake**. In the spring of 2005, after the blasting had begun, Ms. Dyer's sons, Paul and Richard, checked on the house and noticed several changes in the condition of the home, including: a three inch drop in the center of the basement floor; new and enlarged cracks in the foundation; and a sagging support beam that caused the first floor to be noticeably unlevel.

According to a seismograph placed adjacent to the Dyer home, **at least six of the blasts exceeded guidelines set by United States Bureau of Mines** (USBM), which are intended to create a "safe operating envelope" in order to minimize property damage from seismic vibrations. Mark Peterson, an expert in ground engineering consulted by the Dyers, testified at a deposition that blasts conducted within the "safe operating envelope" were unlikely to cause damage to structures within a building, but also opined that if the building was underlain with uncontrolled fill, as opposed to engineered fill, the home could potentially have been damaged even if the blasts were within the established guidelines.

DYER v. MAINE DRILLING BLASTING INC (2009) | FindLaw

On September 22, 2004, Maine Drilling distributed a form notice that informed the Dyers that Maine Drilling would begin blasting rock near the home on or about October 1, 2004, in connection with a construction project to replace the Waldo-Hancock Bridge and bridge access roads. The notice stated that **Maine Drilling uses "the most advanced technologies available to measure the seismic effect to the area," and assured the Dyers "that ground vibrations associated with the blasting [would] not exceed the established limits that could potentially cause damage."**

Maine Drilling conducted over 100 blasts between October 2004 and early August 2005. The closest blast was approximately 100 feet from the Dyer home. Vera was inside the home for at least two of the blasts and felt the whole house shake. **During other blasts, she was not in the home because Maine Drilling employees advised her to go outside**.

In the early spring of 2005, after the blasting work had begun and while Vera remained in Florida, both Paul and Richard observed several changes from the pre-blasting condition of the home and the garage:
(1) the center of the basement floor had dropped as much as three inches;
(2) the center beam in the basement that supported part of the first floor was sagging, and as a result the first floor itself was noticeably unlevel;
(3) there was a new crack between the basement floor and the cement pad that formed the foundation of the chimney in the basement;
(4) new or enlarged cracks radiated out across the basement floor from the chimney foundation; and
(5) cracks that had previously existed in the garage floor were noticeably wider and more extensive.

The brothers also noticed that a flowerbed retaining wall that helped to support the rear wall of the garage had "moved demonstrably."

N.H. residents: Fighting blasting company no easy road

N.H. residents: Fighting blasting company no easy road 2013

A month into blasting for the project in mid-December 2010, **Merrimack's Fire Chief Michael Currier briefly revoked Maine Drilling and Blasting's blasting permit, which had been granted by the town's planning board, because the company had exceeded the town's noise-level threshold three times in seven days.**

After the second noise violation in December, Merrimack couple Phil Straight and his wife, Nancy Harrington, now a member of the Merrimack Town Council, noticed cracks in their home's sheet-rock wallboards and around a window set in cement in their basement and filed a complaint with the fire department. Fellow Merrimack resident Mike Mills filed two complaints during the project's blasting phase.

“We have numerous door frames that don’t open and close properly and door frames that don’t fit on the top or bottom anymore,” Mills said. “The whole house shifted. We have a crack in our living room that was there initially, but had grown four feet horizontally and three to four inches vertically.”

He estimated the overall cost of the damage to his property at around $7,800.
Shortly after reporting their complaints to Merrimack’s fire department, the residents received visits from a representative from Maine Drilling and Blasting to inspect whether their claims were valid.

“They came out, looked at everything, and said, ‘Oh, you have damage to your home,’” said Mills, who filed another complaint after he had noticed more damage. “They came out and inspected again, and **they said, ‘Oh, yeah, you have more damage now, but it wasn’t caused by us.’”**

Once home inspections were over, the company sent similar-looking denial claim letters to the residents. In those letters, **Maine Blasting and Drilling wrote that after they conducted a thorough investigation, looking at pre-blast surveys, project-blasting logs and seismograph readings, it had concluded that damages were “not the result of our blasting.”**

“I’m not aware of a single instance in all the 25 blasting complaints filed in the town of Merrimack anyone ever receiving anything from the company,” said Mills, who organized abutters who filed damage complaints to explore options they could pursue collectively. “Other than their **denial letters, saying, ‘Everything is fine, and damages had nothing to do with our blasting.’”**

On the other hand, **they were told in those letters to contact their homeowners’ insurance,** which the couple did.

“They told us we could file a claim and pay the $500 deductible; they would then go after a reimbursement from Maine Drilling and Blasting, but if they didn’t get reimbursed, we would be penalized,” said Mills. “The reality is sheet rock can be fixed — it’s not going to add up to the $500 deductible, but there is nothing we can do near the window cracks — that’s just too costly. I consider myself lucky, but it’s **the moral of the story that they didn’t accept responsibility**, and that bothered me more.”

Other options they explored offered uncertain outcomes. They could file a lawsuit and risk losing, or file a claim on their homeowners’ insurance and risk higher premiums.

The option most, if not all, ultimately settled on: Pay for the damages themselves.

“Everyone had to just eat it,” said Straight.

As for what he would recommend to Marblehead’s Glover School abutters, Straight was pessimistic about them gaining satisfaction from Maine Drilling and Blasting.

“They’re just going to tell you it’s going to be a long process to get the claims resolved until you give up and go away — that seems to be their mode of operation,” he said.

Mills has not given up on pursing the company for his damages, however. He explained he has taken Maine Drilling and Blasting to small claims court, noting that the trial is set for early February.

His advice for Marbleheaders, though it may be too late, would be to have the source of the damage be determined by an independent company, not Maine Drilling and Blasting nor its insurance company. In his case, “The determination of whether blasting damage was caused by Maine Drilling and Blasting was [made by] Maine Drilling and Blasting,” he noted.

Mills also recommended, “Any community that allows any blasting of any magnitude to take place should require the blasting company to post a bond for damages caused. An independent company needs to be chosen by the town or someone without interests in the blasting who is paid by the general contractor or subcontractor to conduct pre-blast and claim inspections.”

Had a third-party, independent company inspected his damage and determined it wasn’t caused by blasting, Mills said, “I would have said, ‘OK, Mike, you were wrong,’ and moved on.”

He added, “When you have 25 families in Merrimack with filed damage complaints — I’ve lived here since 1982 and my wife has for 42 years — these people don’t have an agenda; it’s an honest town. **We just want our home to look like it did before blasting occurred.”**

Harrington advised Marbleheaders to “document everything.”

She said, “I know for a fact that there were people who didn’t put a claim in because, they said, ‘Well, it’s not worth it.’”

Had more Merrimack residents gone through the process of documenting damage, she believes they would have had a stronger case to bring about more accountability.

“I wish there was more accountability that came out of our situations,” Harrington said. “When **it becomes a pattern,** it’s a problem.”

Maine Drilling & Blasting, Inc. v. Insurance Co. of North America, 7410
Maine Drilling & Blasting, Inc. v. Insurance Co. of North America
Law Docket No. FED-94-711.
Supreme Judicial Court of Maine.
Argued Feb. 27, 1995.
Decided Sept. 29, 1995.

Brox Industries, Inc., an excavation contractor, subcontracted to Maine Drilling the blasting work necessary for the excavation required to construct a building. Maine Drilling was the named insured in a comprehensive general liability (CGL) policy issued by INA, to which an "Explosives Limitation Endorsement" was attached. After Maine Drilling had performed its work, Brox discovered that the blasting had caused the foundation ledge to be fragmented at a level lower than desired. Brox incurred expenses for extra excavation and additional structural gravel to raise the grade of the foundation to its planned level. Maine Drilling notified INA of the potential claim, seeking indemnity and defense costs, but INA refused to defend Maine Drilling in the ensuing litigation between Maine Drilling and the excavation contractor. This litigation resulted in arbitration and a stipulated judgment against Maine Drilling for approximately $330,000.

Maine Drilling and Blasting

"I wanted to take a moment to thank you for the wonderful job your team provided in the drilling and blasting for my Quarry. As you know, we faced what seemed to be insurmountable challenges including short timeframes, **false stop-work orders from the code enforcement officer**, unending complaints up and down the chain of command at your Company, politically and to DEC. **Neighbors were difficult to deal with for house inspections**. I could go on and on with the **friction** we incurred. **Your team was professional, despite the neighbors being difficult**, and documented everything accordingly. I want to thank you for getting involved and helping host a meeting with your team, my attorney and assisting me with what was required paperwork you needed from DEC to overcome issues with the Town. I also want to personally thank your Blaster in Charge for his professionalism. He always kept his composure and continued with the tasks at hand despite the **negativism** surrounding him. The blast was a success and I look forward to working with your organization in the future. A big thank you and may God bless you all."

Eric Schachtler - / Schachtler Mine

https://www.maine.gov/dep/bep/2023/12-21-23/Maine%20Drilling%20and%20Blasting%20Inc%20Board%20Memo.pdf

Augusta contractor pays for 2 quarry blasts

AUGUSTA — Contractor and quarry owner Steve McGee has signed a consent agreement with the city that acknowledges a subcontractor working for his firm failed to properly notify all neighbors prior to two blasts in his West River Road pit last year.

He also agreed to pay $3,500 to the city, though the subcontractor, Gardiner-based Maine Drilling and Blasting, wrote the actual check to the city, not McGee.

McGee signed the agreement only after the city filed a lawsuit against his West Gardiner-based Steve McGee Construction last week.

Of the $3,500 paid to the city, $3,000 was for a fine imposed on McGee. The remaining $500, according to City Attorney Stephen Langsdorf, is to cover the city's costs incurred in drafting and filing the lawsuit.

The incidents that prompted the city lawsuit and resulting consent agreement were two blasts at McGee's quarry operation in a pit off West River Road, near the Grandview neighborhood, on Nov. 3 and Dec. 14 of last year.

Department of Environmental Protection officials, who are also considering sanctions against McGee for the same two incidents, said the blasts **sent dust into the Grandview neighborhood.**

In March, the city said McGee Construction **failed to comply with all requirements of the city's blasting ordinance to notify neighbors** within a certain distance of the pit before those two blasts.

The city, in its first proposed consent agreement regarding the blasts, suggested McGee pay a $5,000 fine and agree to comply with the city's blasting ordinance, setting a deadline of March 14 to do so.

However McGee did not sign the agreement nor pay the fine, which was negotiated down to $3,000, until after the city filed its lawsuit.

"As a result of my filing suit he decided to sign the agreement I had previously drafted," Langsdorf told city councilors. "Because he did not do so prior to litigation he agreed to pay an additional $500 to cover the city's costs for drafting and filing the complaint. I will now be dismissing the case."

The consent agreement signed by McGee acknowledges "**Maine Drilling and Blasting did not properly provide notice… to property owners in accordance with the ordinance. Specifically, only a selected subset of property owners qualified to receive notice was notified**. In the event that McGee, or a subcontractor, is in violation of blasting or any related ordinance in the future, the city will take further action, including but not limited to the possibility of rescinding licenses for the operation of the McGee Quarry."

Langsdorf noted that McGee previously signed a consent agreement after failing to comply with the same notification requirements for a Sept. 8, 2008, blast, and paid a $1,500 fine, making the two latest blasts the second and third documented violations.

The McGee quarry is in a pit which is also the site of a R.C. & Sons Paving asphalt plant that, while not involved in the two blasts, has also drawn complaints from neighbors about odor, noise and dust.
Keith Edwards — 621-5647
kedwards@centralmaine.com

Andover residents denied damage claims after blasting | Merrimack Valley | eagletribune.com

ANDOVER — The claims of residents who allege their homes were damaged by blasting on Elm Street this winter are getting denied, and at least one of them has filed a complaint with the state. Rob Ciampa, of 53 Pine St., claims the blasting caused a crack in his basement floor and in a ceiling in his home. "We were fine until there was one day of blasting we suffered a crack to the basement floor and a ceiling," he said.

Ciampa isn't alone. "There is quite a bit of consistency around what a lot of us are experiencing," Ciampa said. "Pretty much **across the board all the claims have been rejected even though we have proof**. It's forcing us to really work with our insurance companies." **"We're realizing Maine Drilling and Blasting has a lot of history on this," he added. "People raise damage claims and they basically deny all of it."**

Ciampa said town employees have done little to assist residents near the development who claim their homes have been damaged. "We have had zero support from the town of Andover," He said. "Which is the biggest disappointment. It's a horrible way to treat citizens."

Andrew Gordon, of 15 Pine St., has a four-and-a-half-foot long crack in his foundation, and he said the crack is the result of blasting. According to Gordon, around 30 residents have filed claims, at least eight of which have been denied.

"Maine Drilling and Blasting, they've been in lawsuits for fraud, forgery, unbelievable amounts of scandal," Gordon said. "**Capital Senior Housing chooses to use the cheapest, nastiest companies to deal with. Here they hire Maine Drilling and Blasting.**"

Gordon claims Maine Drilling and Blasting came to his home for a pre-blast inspection and videotaped the home inside and out, yet when they came back and filmed the crack, his claim was still denied. "Even though I have video proof from the pre-blast video inspection there was no crack, now I have a crack," he said. "Yet they deny me the $625 it is going to cost to weld that crack. Gordon said he had to pick an exact day the crack occurred when he filed the claim, but **Maine Drilling and Blasting alleges that the day he claims the damage occurred the blasting was not powerful enough to have created a crack**. Gordon said there were 39 days of blasting, 42 blasts, and he simply wasn't checking for damage on a daily basis. "I'm not in my basement every day watching for a crack to appear," he said. "**This is how they get around it — the state, the town. Blast away and they walk away. It's disgusting**."

Gordon has filed a complaint against both his insurance company and Maine Drilling and Blasting's insurance company for the denial of his claim with the Massachusetts Division of Insurance. **Maine Drilling and Blasting Marketing Director Kathy Guerin declined to comment on the individual claims of Andover residents. "At Maine Drilling & Blasting, we take safety, and our role in the local communities we serve, very seriously," Guerin wrote in an email. "We work very hard with customers, communities and the general public to best manage appropriate blasting services. "We have a rigorous process we follow to investigate any claims of property damage that homeowners believe have resulted from our controlled detonation**

https://www.wfmz.com/news/area/poconos-coal/2-injured-in-explosion-at-quarry-in-schuylkill-county/article_ec5f1b6e-48c5-11ed-ac75-6b49fd9880fd.html

PORTER TWP., Pa. — Two people were injured after an explosion at a quarry in Schuylkill County, authorities said.

The explosion at Summit Quarry in Porter Township was reported at 11:45 a.m. Monday, dispatchers said. Porter Township is about 16 miles north of Bethel, Berks County.

According to authorities, two employees suffered what are believed to be non-life threatening injuries. The two people injured were employees at **Maine Drilling and Blasting**, a company that has its Mid Atlantic North Division headquartered in Bethel Township, Berks County.

Pennsylvania State Police said the explosion happened as workers were disposing of boxes which previously contained boosters used in the blasting process.
Several vehicles and a Maine Drilling and Blasting office trailer were damaged, state police said.

One neighbor said he was in his Porter Township auto repair shop when he felt something he never experienced before.

Summit Quarry Porter Township explosion
James Madenford was in his nearby Porter Township auto repair shop when he said he felt the impact of the blast, which knocked him down.

Jack Reinhard | 69 News

"I just felt this big gush of air and before you know it, it kind of took, like it kind of took the breath away from me and just this big explosion," said James Madenford.

Federal, state and local authorities were notified after the blast.

The company said Monday's explosion was an isolated incident and that it maintains a very good safety record.

Madenford said the blast knocked items off his shelves and sent him to the ground, causing ringing in his ear which he said prompted him to go to the emergency room.

"When I get up and start moving around and start looking around, I'm like what just happened?" Madenford said.

State police say the investigation is ongoing.

As for Madenford, he said he hopes nobody has to ever experience what he endured.

"My prayers are out to all the people up there that had to endure that because I know what I endured here," he said, "and I can only imagine what it was up there."

Lawsuit over blasting filed against city of Augusta, local construction, blasting firms

Lawsuit over blasting filed against city of Augusta, local construction, blasting firms

A Kenneth Street couple says their home has been damaged and that the blasting has caused 'emotional distress.'

Updated July 27, 2017

This Sept. 4, 2015 view shows the McGee Construction pit from the east side of Kennebec River in Augusta. A couple who live in the Grandview neighborhood near the pit say blasting there has damaged their home. Staff file photo by Joe Phelan

AUGUSTA — A couple who live near a West River Road quarry operation that has been the subject of a long-running dispute with some of its neighbors has sued its owner, **the company that blasts on the site** and the city of Augusta, claiming blasts to free up rock in the quarry have damaged their home, caused problems with their water and caused them emotional distress.

The lawsuit filed by Cheri and Pietro Nicolosi **against the city of Augusta**, McGee Construction, and **Maine Drilling and Blasting** seeks compensation for damages to their home and to have McGee's permit to blast and extract rock at the site revoked. The amount of the compensation for damages was not listed in the lawsuit, other than "all damages allowed under Maine law, including reasonable costs and attorney fees."

The suit, filed for the Kenneth Street couple by Bangor attorney Eugene Sullivan Jr., claims blasting close to a residential neighborhood — in this case, the Grandview neighborhood — constitutes an "ultrahazardous activity," poses a high degree of harm and is an abnormally dangerous activity.

It alleges that since 2011, the couple's home, in the Grandview neighborhood about 1,000 feet away from McGee's quarry, sustained "**cracks in the basement, damage to exterior walkway and driveway, floor tile cracks, nails popping, wall cracking, issues with water quality, uneven living room bay window, grout in bathroom floor deteriorated, shower [h]ead issues, black mold in dishwasher and shower," and problems with a dining room light and the septic system.**

It also states Cheri Nicolosi has suffered emotional distress, which her doctor is prepared to testify was aggravated by the blasting activity.

It states the city of Augusta regularly has issued permits to McGee for blasting "despite knowledge of complaints from plaintiffs and other individuals similarly situated in that neighborhood."
City Manager William Bridgeo said the Maine Municipal Association's Property and Casualty Pool, Augusta's insurance carrier, would defend the city in the lawsuit, which court records indicate was filed July 7.

He declined to comment on the pending litigation, saying only the city takes such matters seriously and that "we'll rely on the attorneys at Maine Municipal Association to provide a defense in the matter."

Michelle Allott, an attorney with Farris Law who represents the West Gardiner-based McGee Construction, declined to comment Wednesday.

Will Purington II, regional manager for Maine Drilling and Blasting, said the company "is aware of what's going on up there and we're engaged in the process."

Residents of the Grandview neighborhood have complained for many years about activities at McGee's pit, mostly about blasting but also, in 2011, about odors coming from a former asphalt plant operated by another, since closed, business operating there.

McGee officials and **the technical supervisor for Maine Drilling and Blasting, which blasts for McGee in the pit, have said their blasting is safe and has not damaged homes in the neighborhood.**

McGee's mineral extraction license for the site, which includes the ability to blast to free up rock and aggregate materials, used in construction projects, is up for review and potential renewal by the Augusta Planning Board. Last month the board postponed consideration of the license renewal until its Aug. 8 meeting, so board members could consult with a blasting expert.

Augusta quarry operators want to move ahead with license renewals

. . . Councilors failed to reach consensus on other recent proposals meant to address neighbors' concerns after extensive debate last year and extending into this year.

Neighbors have complained that blasting at McGee's pit has damaged their homes, made it hard to sell them by lowering their property values, and disrupted their lives with noise and vibrations.

However, a representative of **Maine Drilling and Blasting, the Gardiner-based firm that does the blasting in McGee's pit, told city councilors last year the blasts are safe and do not damage nearby homes**. And **company owner Steve McGee has said property values in the neighborhood have not been harmed by blasting**.

Augusta quarry's neighbors attribute house damage to blasting

AUGUSTA — Grandview neighborhood residents said blasting at a quarry operation in a pit adjacent to their neighborhood has **made it impossible to sell their homes at their full value and caused cracks in their homes' floors and walls, and it makes them anxious before and angry after blasts** that can occur up to 10 times a year.

They asked the city, as they have before, to take action to protect their neighborhood. Councilors are considering a proposal to reduce the size of blasts in quarries in the city.

Roland Maheux, who lives with his wife, Anna, on Edwards Street, about **760 feet** from the blasting area of the McGee Construction-owned pit off West River Road, described a Sept. 29 blast as violent and said he literally could **see the walls of his home moving and could feel shaking throughout the home. He said his home has evidence of structural fatigue including cracks in walls and floors, and steps that are slowly creeping farther away from his home.** He said he thinks at least some of that damage "is a result of the pounding my house has taken (from blasting in the quarry) over the last 14 years."

He said he gets anxious before every blast. And he said when a violent blast happens, he reacts so strongly to the potential damage to his home that he used to go outside after some of them and yell and scream.

Other neighborhood residents said they also think cracks and other damage to their homes has been caused by blasting at the pit.

Patrick Street resident Gary Leighton said he and his wife have **tried twice over the last six years to sell their home but have been unable to do so.** He said he thinks the blasting, as well as publicity

and the resulting stigma attached to it, has hurt their ability to sell their home, even though it is beautiful home with a big yard and good neighbors.

“Our hope is that a resolution can finally be reached so those of us who want to sell can do so, and those who want to remain can enjoy our neighborhood,” Leighton said.

Last week councilors heard a presentation from the technical supervisor for Gardiner-based **Maine Drilling and Blasting**, the firm contracted to blast rock in a quarry owned by McGee Construction off West River Road in Augusta. He spoke about blasting and when it does and does not present a potential danger to property.

City officials are considering proposed changes to the city blasting ordinance that would reduce the standards for allowable blasts in quarries in Augusta to just 15 percent of the city’s current standards, which are already tighter than state blasting standards. Blasting and construction company officials said last week that standard would be so low it wouldn’t be economically feasible to continue blasting rock for construction projects.

Industry representatives said last week they would work with the city staff to come up with a potentially new standard as a compromise that would reduce the vibrations coming from blasts but still allow the companies to operate their quarries.

Matt Nazar, development director for the city, said that has not yet happened.

One resident who lives near a pit, in contrast to the several who complained about the impact of blasting, said he hasn’t had any problems with a Quirion Construction quarry operation that blasts in two pits near his home.

Ross Doer, who said his West River Road home is 150 to 300 feet away from a quarry where Quirion blasts, said their home was built in 1789. He said there has been no damage to his home’s original horsehair plaster, or any other damage from blasts.

“We couldn’t tell you how many blasts there have been, because it is so insignificant to us,” he said. “For us, for Quirion Construction, there is no issue.

However Lou Craig, a Grandview resident, said he believes blasting at the McGee pit has damaged his home, including causing a massive horizontal break he said will cost him thousands of dollars to fix.

He said he’s filed a claim with Maine Drilling and Blasting over the damage.

He said he thinks no blasting should be allowed in the McGee pit.

Councilors were not expected to take action on the proposed changes Thursday.

City Manager William Bridgeo said the city is working with an independent expert to have the presentation made by Smith, and other information presented to the city, analyzed. He said councilors would discuss those findings at a future meeting, likely Dec. 8.

Meanwhile, more blasting is expected to occur Friday afternoon at the site.

The proposal for tighter rules was made in response both to ongoing complaints from residents of the Grandview neighborhood and to a city official describing a blast he observed from inside a home as startling and alarming. The Grandview neighborhood is next to a McGee Construction-owned pit and quarry operation that blasts rock up to 10 times a year off West River Road. Nazar has attended roughly 40 blasts at quarry operations, mostly in the McGee pit, over the last 10 years. During a recent blast, Nazar was in the home of Maheux, and he said the blast was “startling” and felt much more significant than blasts of similar size he observed outside.

Smith said that blast was not damaging to buildings despite what Nazar felt. He said it is a natural human reaction to be surprised by blasts. Nazar said that blast and the other blasts he’s observed at the West River Road pit this year were well below allowable standards for ground vibration contained in the city’s blasting ordinance. He said data indicated the blast was only 20 percent to 25 percent of the maximum allowable blast. So if the city wants to address neighbors’ concerns by reducing the blasts’ impact, the city’s allowable standards would have to be lowered dramatically.

Disputes between the pit owner and neighbors about the effect of blasting there go back many years, and the city’s current mining and blasting rules were formed after a lengthy process involving multiple interested parties.

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https://www.eagletribune.com/news/merrimack_valley/andover-residents-denied-damage-claims-after-blasting/article_8a047bfc-ef96-5e09-9c1b-696da261a243.html

Andover residents denied damage claims after blasting

By Kelsey Bode | kbode@eagletribune.com Aug 12, 2018

ANDOVER — The claims of residents who allege their homes were damaged by blasting on Elm Street this winter are getting denied, and at least one of them has filed a complaint with the state.

Rob Ciampa, of 53 Pine St., claims the blasting caused a crack in his basement floor and in a ceiling in his home.

“We were fine until there was one day of blasting we suffered a crack to the basement floor and a ceiling,” he said.

Ciampa isn’t alone.

“There is quite a bit of consistency around what a lot of us are experiencing,” Ciampa said. “**Pretty much across the board all the claims have been rejected even though we have proof**. It’s forcing us to really work with our insurance companies.”

“**We’re realizing Maine Drilling and Blasting has a lot of history on this**,” he added. “People raise damage claims and they basically deny all of it.”

Ciampa said **town employees have done little to assist residents** near the development who claim their homes have been damaged.

“We have had zero support from the town of Andover,” He said. “Which is the biggest disappointment. It’s a horrible way to treat citizens.”

Andrew Gordon, of 15 Pine St., has a four-and-a-half-foot long crack in his foundation, and he said the crack is the result of blasting. According to Gordon, around 30 residents have filed claims, at least eight of which have been denied.

“**Maine Drilling and Blasting, they’ve been in lawsuits for fraud, forgery, unbelievable amounts of scandal,” Gordon said**. “Capital Senior Housing chooses to use the cheapest, nastiest companies to deal with. Here they hire Maine Drilling and Blasting.”

Gordon claims Maine Drilling and Blasting came to his home for a pre-blast inspection and videotaped the home inside and out, yet when they came back and filmed the crack, his claim was still denied.

“Even though I have video proof from the pre-blast video inspection there was no crack, now I have a crack,” he said. “Yet they deny me the $625 it is going to cost to weld that crack.”

Gordon said he had to pick an exact day the crack occurred when he filed the claim, but Maine Drilling and Blasting alleges that the day he claims the damage occurred the blasting was not powerful enough to have created a crack. Gordon said there were 39 days of blasting, 42 blasts, and he simply wasn’t checking for damage on a daily basis.

“I’m not in my basement every day watching for a crack to appear,” he said. “**This is how they get around it — the state, the town. Blast away and they walk away**. It’s disgusting.”

Gordon has filed a complaint against both his insurance company and Maine Drilling and Blasting’s insurance company for the denial of his claim with the Massachusetts Division of Insurance.

Maine Drilling and Blasting Marketing Director Kathy Guerin declined to comment on the individual claims of Andover residents.

“At Maine Drilling & Blasting, we take safety, and our role in the local communities we serve, very seriously,” Guerin wrote in an email. “We work very hard with customers, communities and the general public to best manage appropriate blasting services.”

“We have a rigorous process we follow to investigate any claims of property damage that homeowners believe have resulted from our controlled detonations, and we handle these claims accordingly,” she added. “However, it is company policy not to comment on claims, active or closed.”

Capital Seniors Housing, the developer behind the Stonehill at Andover project, also declined to comment.

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https://www.pressherald.com/2015/09/21/augusta-quarry-pit-neighbors-say-blasting-damaged-homes/

Augusta quarry pit neighbors say blasting damaged homes

Two residents say the May blast that sparked the city to file a lawsuit caused cracks in floors, walls and ceilings of their homes.

September 21, 2015 Keith Edwards Kennebec Journal

AUGUSTA — Some residents near a quarry operation in a pit off West River Road that has been controversial with its neighbors say a May blast that prompted the city to file a lawsuit also caused cracks in the floors of their homes.

A resident who lives about two-tenths of a mile north of the pit's entrance on West River Road and roughly **2,000 feet away from the pit itself says she believes the concrete floors and walls of the basement in her 8-year-old home were cracked by the May 13 blast**, which she said felt and sounded like a bigger blast than other blasts at the pit owned by Steve McGee Construction.

Donna Bonenfant said gaps of roughly a quarter-inch opened up between several of the floor joists and the main support beam of the main floor of her home, visible from the basement, gaps which she said weren't there before the blast. What appear to be water stains are visible around some of the cracks in her basement walls.

"I don't know what to do about these. What if it leaks?" Bonenfant said, pointing to one of several cracks spread across parts of the concrete basement floor of her home. "I know to expect some cracks, but this many? A cement contractor looked at it and said there is no way all these cracks would come from just the house settling."

Across the Kennebec River from the pit site, Riverside Drive resident John Liacos said he noticed hairline cracks in some of the ceramic floor tiles installed when his home's kitchen was redone in the spring of 2014, which he doesn't believe were there before the May blast. He said he's also discovered small cracks in the drywall of the kitchen ceiling.

Liacos acknowledged he's not sure of the date when he first noticed the cracks, but said a contractor who looked at the cracks said they had to have been caused by "something serious," and Liacos suspects it was the blast.

Bonenfant and Liacos both said they contacted the company that did the blasting, Maine Drilling and Blasting, to file claims for the damage. Both said their claims were rejected.

"**We got a letter saying, sorry, we're not responsible for it**," Liacos said. "If nobody is willing to admit it, what are you going to do? I want to be treated fairly. I was hoping to get some sort of resolution from Maine Drilling and Blasting."

Kathy Guerin, marketing director for Gardiner-based Maine Drilling and Blasting, said the company was not able to respond to specific details about the Augusta residents' claims, saying only, "Please know that safety is very important to Maine Drilling and Blasting, and we work very hard with customers, communities and the general public to best manage appropriate blasting services."

A letter from a Maine Drilling and Blasting safety specialist sent to Bonenfant said the company's investigation into her claim consisted of a complete review of project blasting logs, seismographic readings, review of the pre-blast survey and a post-blast claim inspection.

"**After a complete review of that data available to us, we have determined that blasting is not the cause of your claims as presented**," the letter stated.

Geoff Cobb, a project manager for McGee Construction, said he doubted the blast at the pit caused damage to neighbors' homes but said the blasting was the responsibility of Maine Drilling and Blasting to oversee and ensure that it didn't cause damages.

"We rely on Maine Drilling and Blasting to do what's right," he said.

Bonenfant, mother of at-large City Councilor Jeffrey Bilodeau, said she wasn't sure what she's going to do but said she has not filed a lawsuit over the incident.

Bonenfant said she and others home the day of the May blast said **it felt and sounded like an earthquake** and seemed bigger than other blasts coming from the quarry.

She said she believes a 2010 blast also caused cracks in her basement and cracks to the drywall in corners on the main floor of the home. She said they paid a contractor $1,000 to fix some of those cracks.

Liacos said he does not intend to file a lawsuit for the damages to his home.

The city, however, has filed a lawsuit over the same blast, alleging the blast exceeded allowable standards and seeking to revoke the Gardiner-based McGee Construction's permit to blast and extract rock in Augusta.

The city's lawsuit alleges the blast was too large and exceeded standards of the Augusta Blasting Ordinance. The court filing states **the blast exceeded both the maximum peak sound pressure limit of 133 decibels and the maximum ground vibration standard, measured in peak particle velocity, of 0.75 inches per second between 500 and 5,000 feet from the blast.**

According to Stephen Langsdorf, the city's attorney, data recorders indicated the blast created **a shock wave of 135.5 decibels**, and in one location the **peak particle velocity hit 1.04 inches per second,** and 0.82 inches per second and 0.79 per second in another location, all above the 0.75 per second maximum.

Langsdorf said vibrations over that level can cause drywall to crack, and shock waves of over 135 decibels can damage buildings.

Gregory Farris, Steve McGee Construction's attorney, said previously the blast did not exceed the city's standards and **"any abnormal readings were due to monitoring equipment issues and not caused by the blast**. The blast complied with the sound pressure and vibration standards set by the city, and no damage was done as a result."

The pit where the blast took place has been the **subject of multiple disputes over the last several years between the operator and its neighbors**, especially those in the nearby Grandview neighborhood, over issues including dust, noise and odors when a since-closed asphalt plant was operated by another company there in the summer of 2011.

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https://tauntonfd.com/2024/05/08/taunton-fire-department-quarry-incident/

Taunton Fire Department Quarry Incident

May 8, 2024 by Elizabeth Kalaijian

Taunton Fire was made aware of a complaint on April 29, regarding an incident at the quarry with the possibility of **debris coming into neighboring yard**s on Fremont St. Taunton Fire notified the State Fire Marshal's office and opened an investigation into the complaint – shutting down blasting for a week while an investigation was underway. Preliminary information suggests that **this incident was caused by a mistimed detonation**. No injuries were reported and there was no property damage. The investigation concluded that the company Maine Drilling and Blasting and the quarry owner had the appropriate permits for the blasting. It is an on-site blasting operation in a quarry that has been operating at that site for many decades. Taunton Fire will continue to monitor any blasting operations in the city and ensure all state and local codes are followed to ensure the safety of the neighbors and citizens of Taunton. The permit has been re-issued as of May 6.

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https://law.justia.com/cases/federal/appellate-courts/F3/34/1/552076/
Maine Drilling and Blasting, Inc., Plaintiff, Appellant, v. Insurance Company of North America, et al., Defendants, Appellees, 34 F.3d 1 (1st Cir. 1994)

Plaintiff-appellant Maine Drilling & Blasting, Inc., ("MD & B"), subcontracted with an excavation contractor to perform some blasting work on a building construction site. By mistake, **MD & B blasted too far into the ground, leaving an unstable building foundation** which the excavation contractor had to fix at considerable cost. Following litigation and arbitration, MD & B accepted an arbitration settlement calling for MD & B to reimburse the excavation contractor for repairs to the damaged foundation. MD & B now seeks to recover its defense and judgment costs from its commercial liability insurer, defendant-appellee Insurance Company of North America ("INA"). The specific issue on appeal is whether MD & B's insurance policy with INA excludes coverage for the damages in this case pursuant to general exclusions in the policy or whether the policy affords coverage pursuant to a special endorsement that is attached to the policy. The district court found that the general exclusions controlled and ruled in favor of INA. For the reasons set out below, we certify this question to the Supreme Judicial Court of Maine.

3:16-cv-00175-GMG-RWT **Jarrell v. Maine Drilling and Blasting, Inc. et al**
December 29, 2016
US District Court for the Northern District of West Virginia
Complaint:

- On July 13, 2016, Plaintiff was working outside for approximately seven to eight hours.
- During this time, Plaintiff was **not provided any water breaks** despite the fact that the temperature on this day was in the **mid-90s**.
- While working, Plaintiff became severely dehydrated to the point to where **he passed out and could not walk**.
- A co-worker helped Plaintiff up after he passed out.
- Plaintiff was moved to his supervisor, Defendant Whittaker's, truck to cool down and drink water.
- However, Plaintiff informed Defendant Whittaker that he believed he needed to seek medical attention from FLUOR, the onsite, third-party health and safety services provider.
- Moreover, Plaintiff believed that he needed to inform FLUOR of the ongoing conditions which had led to his dehydration.
- Defendant Whittaker discouraged Plaintiff from seeking treatment from or making a complaint to FLUOR.
- Nonetheless, Plaintiff's co-worker loaded Plaintiff onto a side-by-side and drove Plaintiff to FLUOR's safety trailer.

- Plaintiff notified FLUOR of the unreasonably safe working conditions and of his own medical condition.
- Plaintiff was notified by a FLUOR representative that Plaintiff was **the third employee of Defendant MDB to pass out from dehydration**.
- Upon information and belief, FLUOR immediately contacted an upper-level management employee of Defendant MDB regarding Plaintiff's situation.
- After being treated by FLUOR, Plaintiff was instructed by Defendant Neithercoat, to go home for the day.
- The next day, on July 14, 2016, Plaintiff returned to work where he attempted to perform his normal work outside.
- On this particular day, the **temperature was in the high-90s**.
- **Plaintiff again became dehydrated**.
- Plaintiff again notified Defendant Whittaker of his medical condition.
- Plaintiff again notified Defendant Whittaker that he needed to return to FLUOR's safety trailer to seek treatment for his medical condition and to again report the **unsafe working conditions which had affected multiple employees**, including Plaintiff.
- On this occasion, Defendant Whittaker prohibited Plaintiff from returning to FLUOR.
- Defendant Whittaker stated that Defendant could lose work at that job site if Plaintiff returned to FLUOR's safety trailer with another medical condition or complaint.
- Accordingly, Plaintiff returned to Defendant Whittaker's truck and drank water.
- Plaintiff remained at the job site until the end of his shift.
- On July 15, 2016, Plaintiff woke up still experiencing the effects of the dehydration from the day before.
- Plaintiff called Defendant Neithercoat and notified him that he would not be able to make it to work that day.
- Defendant Neithercoat initially told Plaintiff that it was okay for Plaintiff to return to work after the weekend on Monday, July 18, 2016.
- However, several hours later, Defendant Neithercoat called Plaintiff back and notified Plaintiff that Defendants were **terminating his employment**.

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https://www.nashuatelegraph.com/news/local-news/2010/12/30/blasting-firm-denies-homeowner-claims/

Blasting firm denies homeowner claims

By Staff | Dec 30, 2010

MERRIMACK – The construction firm blasting rock for Merrimack Premium Outlets **is not responsible for property damage** reported around the outlet project, **company officials informed area residents** this month.

Over the past five weeks, at least five neighbors have filed complaints of cracked walls and foundations, among other damages, to their homes neighboring the 130-store outlet mall, under construction near Exit 10 of the F.E. Everett Turnpike.

The damage, which could cost thousands of dollars to repair, is connected to construction work that exceeded the town's permitted blasting levels, neighbors say.

But representatives of the project blasting firm, Maine Drilling and Blasting of Auburn, deny the claims, saying the blasts are not sizable enough to cause the damage.

Company officials investigated each complaint, conducted site evaluations and reviewed blast readings to conclude the damages existed before the blast work.

"**After a complete review of the data available to us, we have determined that blasting is not the cause of your claims** as listed," Jeff Immonen, one of the company's safety officers, wrote in a letter to George Adams, who filed a complaint over windows damaged in the basement of his Cedar Lane house.

"They're trying to blame this on me, and I'm completely sure the crack was not there (before)," Adams countered this week. "But then again, they're a big company. What do you expect?"

Company officials did not return calls for comment Wednesday.

The blasts, conducted two or three days a week, have echoed through the neighborhood since late November. But one or two instances in particular are likely to blame for the property damage, neighbors said this week.

Blasts recorded Dec. 2 and Dec. 6 **exceeded permitted noise and vibration levels, prompting town officials to pull the firm's blasting permit** and temporarily suspend construction.

"You can always feel it, but those were really bad," said Barbara Goulet, who reported a 3-foot crack across the living room of her Arbor Street home.

"We had a series of two or three days here where … **my whole house shook**," said David Spitz, who suffered a large crack in the foundation of his house on Camp Sargent Road. "There may have been some hairline cracks (before), but it was nothing like that."

Since they started construction in September, planners from Premium Outlets, the project developer, have worked with town officials to avoid property damage and to stay within the town's guidelines, company representatives have said. "It is our goal that any firm we have contracted to do any work on this project comply with all established guidelines," Michele Rothstein, the company's vice president of marketing, said this month in a written statement.

To appeal the company's conclusions, Maine Drilling officials are urging residents to contact their insurance companies. But neighbors, concerned over the cost of a separate investigation, are exploring other options.

Some residents requested copies of the home survey that company officials took before the blasting to compare against the existing cracks.

Conducting their investigation, company officials consulted the preblast surveys, freeing them of responsibility, they wrote to the complainants.

But Nancy Harrington, who suffered three cracks around the windows of her Spruce Street home, hired an independent engineer to conduct a separate survey, which showed no such damage, she said.

"Quite simply (those cracks) weren't present," Harrington said. "I don't know what (Maine Drilling) is looking at, but they're looking at the wrong thing. … I just want it on record."

Still others are prepared to take their fight to court, if necessary, they said.

“I’m hoping the group (of us) is going to hire a lawyer,” said Adams, who reported foundational damage to his Cedar Lane home. “Little people like me can’t do anything against them, but as a group maybe we can get something done.”

“**They’re really being rotten**, and I’m 99 percent sure I can prove it,” he said.

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https://www.cbsnews.com/boston/news/ner-quarry-blast-rocks-into-yards-taunton/
Quarry blast sends rocks flying into Taunton neighborhood
By Juli McDonald
Updated on: May 10, 2024 / 12:49 PM EDT / CBS Boston
TAUNTON - After a quarry blast that sent rocks flying into their yards, many residents of Fremont Street are surveying their yards and studying the dings and dents, wondering whether they're safe outside.

Scott Schofield was gardening last week when a scheduled blast sent a rock hurling into his yard.

"You have some heads up, but it doesn't give me a warm fuzzy feeling," he said.

Scott Schofield displays one of the rocks that landed in his Taunton yard last week after a quarry blast.

That 'heads up,' comes as recorded calls 24 hours and two hours prior to the blasts from Holcim NER quarry and warning sirens in the moments leading up to the events. Things Fremont Street families are used to - or so they thought.

"She said, "Oh yeah, you wouldn't have liked this one. We heard rocks hitting the train, and they reverberated and caused an echo," Jen Elsinger recalled, of how her daughter described last week's blast.

Investigators say Maine Drilling and Blasting and the quarry had the right permits, but the incident may have been because of a **mistimed detonation**. With warmer weather here, people are uneasy - especially parents like this military veteran.

"I want a peaceful place to live. Right now it's not [a] safe feeling. This can never happen again," said Jeremiah Elsinger.

In a statement to WBZ, Taunton Mayor Shaunna O'Connell said: "An incident occurred at the Holcim NER quarry in Taunton on Monday, April 29, 2024, in which debris from a quarry blast resulted in rocks leaving the

quarry property. The Taunton Fire Department has broad discretion over blasting activities within City limits, and they declined to re-issue a permit to Holcim pending the results of an investigation. An investigation has been completed and the Fire Department is prepared to issue a new permit as they are satisfied that the issue which resulted in the flying debris has been identified and procedures put in place to ensure such an incident does not occur again."

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https://www.**facebook**.com/MDandBofficial/reviews

Jess Galvin doesn't recommend Maine Drilling & Blasting.

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Shady as hell. Treat their employees like crap. String them along then after they find someone willing to pay them what they are worth, they screw them on retirement money. Highly don't recommend being employed by or dedicated to them.

Mark Sallada doesn't recommend Maine Drilling & Blasting.

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Maine Drilling & Blasting (Pennsylvania) you are a scam artist.
As many of you know who live in the local area 700 W Main St Annville, Pa) there are huge warehouses going in behind my facility. To do this they need to blast the stone. The blasting over several months has been right on the property line behind our new facility.

During several blasts, **we are asked to evacuate the facility for safety concerns**. That was not the problem, we have no issues trying to work with a growing community.

2 months ago I filed a claim with them. During one of the blasts, we were asked to leave and at the re-entrance of the building, **one light fixture's guts were hanging from the ceiling, and picture frames were knocked over** on the guy's desk, including mine which is in the next building. I also started to notice several **floor cracks that were not there previously**, I contacted the company to report a claim. The gentleman came out, took a video of the entire facility, and said he will submit his paperwork. A few weeks later and I get this long letter about how **their blast could not have possibly caused any issues**.

Fast forward to just the other week. They did another blast, it was enough to make you jump out of your chair. **That blast knocked a photo from the wall and after immediately checking the building we found a crack in the block wall of the new facility**. Filed another claim and today I received another letter about how **the blast could not have possibly done any damage**.

I am no expert here but I will fall back to some common sense. Take your peak particle velocity shenanigans and try and fool someone else. This does not take rocket science to determine your blast is causing these issues. When you leave the building and everything is fine, you walk back in and stuff is laying on the floor and hanging from the ceiling some little mouse just did not magically do that.
So now a small business like mine gets a lawyer and spends money to try to get your own property fixed all because you simply can't admit to wrongdoing.

Maine Drilling & Blasting We understand things happen but failure to take care of the damage that your peak particle velocity caused is not my issue. You are taking advantage of your surroundings. I was not asking for anything besides just fixing what you damage. Not to mention 12 employees leaving the facility for 15 minutes is $285.00 lost.

Linda Raymond doesn't recommend Maine Drilling & Blasting.

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> Come to North Woburn MA and find out. Residents already have structural damage and getting worse. Blasting hasn't started yet. Police called. **Truck hit neighbor's car**, Police called traffic issues, **Police called rocks on roadway. It's only been 3 months**.

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https://www.youtube.com/watch?v=i9nOu7but48

https://patch.com/massachusetts/marblehead/glover-neighbors-told-they-are-on-their-own

Glover Neighbors Told They Are On Their Own To Fight For Blasting Damages

Almost 30 claims have been filed against blasting company for damages to homes on the same ledge as the new school.

Posted Fri, Feb 1, 2013 at 2:30 am ET Updated Fri, Feb 1, 2013 at 3:30 am ET

The attorney for the town and school district was blunt Thursday night with his advice to the neighbors of the under-construction Glover School. He said they should "**pool their resources and hire an attorney**."

Neither the school district nor the town government was able to do more to resolve their complaints about **cracked walls and foundations** than it already has, said Pat Costello, a partner with the Boston firm of Louison, Costello, Condon & Pfaff.

"**The town has done all it can** and more," Costello said.

He said he understood how frustrating the situation is for the homeowners. "We want to work with you to bring closure for you on these issues," Costello said.

But when pressed on what the town might do, he said it would hurt the process if the town got involved.

The more than two dozen neighbors who came to the meeting in the music room at the Village School were frustrated. One said he was "offended" by Costello's message.

"**That is ridiculous and insulting to tell us we are on our own**," said neighbor Barton Hyte. "**You are throwing us under the bus**."

Costello said state law was very specific. The blasting company, Maine Drilling and Blasting, has a strict liability to pay for the damages it caused.

Twenty-seven homeowners along Alden, Columbia, Homestead Roads and Tedesco Street **have filed claims against Maine Drilling and Blasting**. Most of the houses where the owners say they now have **cracks and other problems** are on the same ledge formation as that of the school, but many of them are outside a 250-foot radius from the blast site, which is supposed to be the potential damage zone.

To build the foundation for the new $25 million school, the construction company had to blast away a substantial amount of rock.

The blasting company, after a post-blast inspection of the homes, **sent the homeowners a form letter denying their claims and suggesting that they file a claim with their personal homeowners' insurance company**.

"If I were representing you, I would send a poison pen letter to the insurance company, demanding that it pay up or go to court," Costello said.

He noted that the insurance companies were liable for treble damages if the court finds the blasting company caused the damages to the homes.

Several homeowners said they were considering filing suit, but **they were not sure who they would sue**. In addition to the blasting company and its insurance company, several suggested they might also sue the general contractor, G&R Construction, and **possibly the town for not protecting their properties** from the school construction.

Costello, who has been representing cities and towns for 25 years, said he would expect any suit against the town would be dismissed quickly.

The neighbors are planning to hold a meeting in the next couple of weeks, where they will decide on the next steps.

"We will write a formal complaint letter and send to all involved parties (including various insurance companies), stating that there are **27 or more houses that have sustained damage**," wrote Kaarina Kvaavik, a neighbor, after the meeting.

School Superintendent Dr. Greg Maass said he has sent the claims of 15 homeowners to USI Insurance Services of New England, the insurance company for the blasting company. The company is based in Manchester, N.H.

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https://www.wickedlocal.com/story/marblehead-reporter/2012/12/23/glover-school-neighbors-air-grievances/40703776007/

Glover School neighbors air grievances about blasting
Neil Zolot / marblehead@wickedlocal.com

The question of **who is responsible for damage to houses** near the Glover School construction site homeowners believe is the result of blasting was left unresolved at the School Committee meeting Thursday, Dec. 20.

Superintendent Gregory Maass recommended that a legal opinion and more information from contractors be sought.

“It’s obvious we need a more definitive answer,” he said.

In a prepared statement, Tedesco Street resident Kaarina Kvaavik asked, “Who is going to assist the abutters who have experienced damage? We experienced damage to our home as a result of blasting on the Glover site. Who will stand up and assume responsibility? Or better yet, actually try to help us? **We do not know why our house was not surveyed before blasting started**. We do not know how many of these claims have received a satisfactory response from the blasting contractor or anyone else up the proverbial food chain.”

She continued, "**As expected, the blasting company blamed the cracks in walls to normal wear and tear**. This is strange, considering **the damage was not there prior to blasting**. What is unsettling is that **it took the blasting company less than 24 hours to come up with its conclusion**, a process that should, in theory, take several days."

Representatives of the companies involved in various aspects of the project were invited to the meeting, with those from Maine Drilling and Blasting answering most of the questions from Committee members. Company safety manager Rick Galletta said 14 claims had been filed, 12 of which had been **denied** and two of which were still pending due to trouble contacting homeowners.

"It's not unusual to have complaints," he explained. "People don't like blasting. **Damage is rare with the type of blasting we do. We investigate every claim, even those without a pre-blast survey**."

Pre-blast surveys were conducted for homes within 250 feet of the site. In addition, the Fire Department asked and got three seismographs for the site instead of the required one, which are required to be set up within 10 feet of a structure near blasting.

Fire Department Chief Jason Gilliland and Capt. Michael Porter reported that all vibrations were within those allowed by codes, and blasts went slightly over the allowed air-blast-pressure limits twice. He also said a seismograph near 12 Maple St. reported levels "well below limits."

Gilliland himself lives with[in] 248 feet of the Glover site and had a pre-blast survey conducted at this home. He reported he felt rumblings but had no damage. When invited to question Galleta from the School Committee table, he asked him why MD and B's insurance company was not investigating the claims.

"We stand behind our investigations," answered Galletta, who acknowledged that **having an insurance company investigate would cost significant money**.

School Committee member Jonathan Lederman told Galletta, "The implication is these are fraudulent claims, and people are trying to take advantage. It sounds unlikely."

Gilliland pointed out complaints are signed under penalties of perjury.

Galletta answered, "I don't think people are claiming fraudulent claims, but people start looking at places they don't normally look and say it must be the blasting (causing damage)."

Lederman also opined that the School Committee should be "the primary contact to solve the problem" and asked Maass to look into mechanisms to "make it right."

Member Tom Connolly said it "is extraordinary there is no objective party to appeal to, no third party one can even direct questions to."

Galletta told him MD&B shares its information with claimants so they can pass it along to their insurance companies.

Other members of what Kvaavik called the “food chain” also spoke. Patrick Saitta, president of the owner’s project manager Municipal Building Consultants, said he could “empathize with neighbors who have had complaints. Construction, by its very nature, is disruptive. Our goal is to make it as palatable as possible.”

Robert Morel, president of general contractor G and R Construction, told the School Committee MD and B has no contractual relationship with the town, only with G and R, before deferring to them as “the experts.”

“It’s a specialized field,” he said.

It was somewhat reminiscent of Kvaavik’s statement in which she said, “It seems as residents we have to navigate a complicated maze: The blasting contractor can hide behind the subcontractor, the subcontractor behind the contractor, the contractor behind the Building Committee and its consultants, the Building Committee behind the School Committee and the School Committee behind the town.”

She did say that she felt some progress had been made.

“**We’re finally getting heard**,” she said after the meeting. “I’m delighted there’s recognition.”

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https://www.andovertownsman.com/news/blasting-damage-claims-denied/article_f209793c-54c7-5a91-9b8e-51563fa99693.html

Blasting damage claims denied

Elm Street homeowners fighting with contractor, developer, town and state

By Kelsey Bode kbode@andovertownsman.com Aug 9, 2018

ANDOVER — The claims of residents who allege their homes were damaged by blasting on Elm Street this winter are getting denied, and at least one of them has filed a complaint with the state. Rob Ciampa, of 53 Pine St., claims the blasting caused a crack in his basement floor and in a ceiling in his home. “We were fine until there was one day of blasting we suffered a crack to the basement floor and a ceiling,” he said.

Ciampa isn’t alone. “There is quite a bit of consistency around what a lot of us are experiencing,” Ciampa said. “Pretty much across the board all the claims have been rejected even though we have proof. It’s forcing us to really work with our insurance companies.” “We’re realizing **Maine Drilling and Blasting has a lot of history on this**,” he added. “**People raise damage claims and they basically deny all of it.**” Ciampa said town employees have done little to assist residents near the development who claim their homes have been damaged. “We have had zero support from the town of Andover,” He said. “Which is the biggest disappointment. It’s a horrible way to treat citizens.” Andrew Gordon, of 15 Pine St., has a four-and-a-half-foot long crack in his foundation, and he said the crack is the result of blasting. According to Gordon, around 30 residents have filed claims, at least eight of which have been denied. “**Maine Drilling and Blasting, they’ve been in lawsuits for fraud, forgery, unbelievable amounts of scandal**,” Gordon said. “Capital Senior Housing chooses to use the cheapest, nastiest companies to deal with. Here they hire Maine Drilling and Blasting.”

Gordon claims Maine Drilling and Blasting came to his home for a pre-blast inspection and videotaped the home inside and out, yet when they came back and filmed the crack, his claim was still denied. “Even though I have video proof from the pre-blast video inspection there was no crack, now I have a crack,” he said. “Yet they deny me the $625 it is going to cost to weld that crack.” Gordon said he had to pick an exact day the crack occurred when he filed the claim, but Maine Drilling and Blasting alleges that the day he claims the damage

occurred the blasting was not powerful enough to have created a crack. Gordon said there were 39 days of blasting, 42 blasts, and he simply wasn't checking for damage on a daily basis. "I'm not in my basement every day watching for a crack to appear," he said. "This is how they get around it — the state, the town. **Blast away and they walk away**. It's disgusting." Gordon has filed a complaint against both his insurance company and Maine Drilling and Blasting's insurance company for the denial of his claim with the Massachusetts Division of Insurance. Maine Drilling and Blasting Marketing Director Kathy Guerin declined to comment on the individual claims of Andover residents. "At Maine Drilling & Blasting, we take safety, and our role in the local communities we serve, very seriously," Guerin wrote in an email. "We work very hard with customers, communities and the general public to best manage appropriate blasting services." "We have a rigorous process we follow to investigate any claims of property damage that homeowners believe have resulted from our controlled detonations, and we handle these claims accordingly," she added. "However, **it is company policy not to comment on claims**, active or closed." Capital Seniors Housing, the developer behind the Stonehill at Andover project, also declined to comment.

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https://www.yelp.com/biz/maine-drilling-and-blasting-hartford
Literally almost gave my life for this Horrible company. I worked there and was fired for a work accident explosion that was so bad it took out 5 people 12cars and 2 building while off on leave for the injury me and everyone else beIdes one person got fired without cause and denied workers comp and even unemployment absolutely disgusting...

If OSHA and MSHA were to go on site they would be shit down horrible outfit they run there they only care about themselves and do not care at all for employees.. From what wS said the explosion was done so that the company can claim on the insurance and throw all the good people u der the bus and destroy they lives and not give a dam about you

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https://www.osha.gov/ords/imis/establishment.violation_detail?id=312542079&citation_id=01010
Violation Detail
Standard Cited: 19260905 P Loading of explosives or blasting agents.

https://www.osha.gov/ords/imis/establishment.inspection_detail?id=312542079

Violations/Penalties	Serious	Willful	Repeat	Other	Unclass	Total
Initial Violations	10			1		11
Current Violations	8			3		11
Initial Penalty	$26,000	$0	$0	$0	$0	$26,000
Current Penalty	$15,200	$0	$0	$0	$0	$15,200
FTA Penalty	$0	$0	$0	$0	$0	$0

https://www.osha.gov/ords/imis/establishment.inspection_detail?id=1627293.015

Violations/Penalties	Serious	Willful	Repeat	Other	Unclass	Total
Initial Violations	1					1
Current Violations				1		1
Initial Penalty	$15,625	$0	$0	$0	$0	$15,625
Current Penalty	$0	$0	$0	$10,000	$0	$10,000
FTA Penalty	$0	$0	$0	$0	$0	$

https://www.osha.gov/ords/imis/establishment.inspection_detail?id=1545223.015

Violations/Penalties	Serious	Willful	Repeat	Other	Unclass	Total
Initial Violations	1			1		2
Current Violations	1			1		2
Initial Penalty	$3,316	$0	$0	$663	$0	$3,979
Current Penalty	$2,321	$0	$0	$464	$0	$2,785
FTA Penalty	$0	$0	$0	$0	$0	$0

https://www.osha.gov/ords/imis/establishment.inspection_detail?id=303450381

Violations/Penalties	Serious	Willful	Repeat	Other	Unclass	Total
Initial Violations	1			1		2
Current Violations				2		2
Initial Penalty	$825	$0	$0	$0	$0	$825
Current Penalty	$0	$0	$0	$0	$0	$0
FTA Penalty	$0	$0	$0	$0	$0	$0

https://www.osha.gov/ords/imis/establishment.inspection_detail?id=314960477

Violations/Penalties	Serious	Willful	Repeat	Other	Unclass	Total
Initial Violations	2					2

Current Violations	2					2
Initial Penalty	$14,000	$0	$0	$0	$0	$14,000
Current Penalty	$8,000	$0	$0	$0	$0	$8,000
FTA Penalty	$0	$0	$0	$0	$0	$0

https://www.osha.gov/ords/imis/establishment.inspection_detail?id=1098882.015

Violations/Penalties	Serious	Willful	Repeat	Other	Unclass	Total
Initial Violations	2					2
Current Violations	1					1
Initial Penalty	$14,000	$0	$0	$0	$0	$14,000
Current Penalty	$7,000	$0	$0	$0	$0	$7,000
FTA Penalty	$0	$0	$0	$0	$0	$0

https://www.osha.gov/ords/imis/establishment.inspection_detail?id=1478954.015

Violations/Penalties	Serious	Willful	Repeat	Other	Unclass	Total
Initial Violations	2			1		3
Current Violations	2			1		3
Initial Penalty	$9,793	$0	$0	$848	$0	$10,641
Current Penalty	$9,793	$0	$0	$848	$0	$10,641
FTA Penalty	$0	$0	$0	$0	$0	$0

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https://www.maine.gov/dep/bep/2023/12-21-23/Maine%20Drilling%20and%20Blasting%20Inc%20Board%20Memo.pdf

021

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

MELANIE LOYZIM
COMMISSIONER

MEMORANDUM

SUBJECT: ADMINISTRATIVE CONSENT AGREEMENT, MAINE DRILLING AND BLASTING, INC.
DATE: December 21, 2023
Statute and Rule Reference: By failing to use sufficient stemming, matting or natural protective cover to prevent **flyrock** from leaving property owned or under control of the owner or operator, Maine Drilling and Blasting, Inc. violated 38 M.R.S. § 490-Z(14)(A).
Location: S-Quarry, Hardy Road, Westbrook, Maine Violator: Maine Drilling and Blasting, Inc.
Description: On June 2, 2020, S.B. Enterprises, Inc. contacted the Department to report that Maine Drilling and Blasting, Inc. had conducted a blast event on that day which resulted in **flyrock leaving the S-Quarry property and landing on two residential properties that abut the quarry property**.
Environmental Issues: The issues associated with the violation are with public safety more than environmental impact. To address this concern, Maine Drilling & Blasting, Inc. immediately took measures to report the incident, meet at the abutter's residence, and submitted an incident report and **modified extraction plan for future blasting intended to prevent flyrock from again leaving the property**.

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https://www.denver7.com/news/national/multiple-people-injured-after-dynamite-accidentally-explodes-at-quarry#google_vignette

Multiple people injured after dynamite accidentally explodes at quarry

By: Douglas Jones

Posted 11:31 PM, Oct 10, 2022 and last updated 11:41 PM, Oct 11, 2022

Multiple people were seriously injured after an accidental explosion of dynamite at a quarry in Central Pennsylvania on Monday.

Authorities said the dynamite was apparently accidentally detonated, injuring five people. Their conditions were not immediately released, but authorities said that at least two were expected to survive, WFMZ reported.

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The explosion happened just before noon.

One person was flown from the scene to a hospital, and four others were taken by road vehicle to receive medical treatment for their injuries, the Associated Press reported.

The injured were **employees at Maine Drilling and Blasting**. Police said the explosion happened while the workers were throwing away boxes that had contained explosive boosters that are used in the dynamite blasting process.

Several vehicles in the area of the explosion were damaged, police said.

The investigation into the cause of the detonation was still ongoing by Wednesday.

Mine Data Retrieval System | Mine Safety and Health Administration (MSHA)

MSHA violations

Mine ID	Event No	Operator	Mine	Citation /Order No.	Case No.	Date Issued	Final Order Date	Date Terminated	Standard	Citation / Order Status	S & S	Proposed Penalty ($)
1800030	6928767	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9803102	601673	04/29/24	08/11/24	04/30/24	56.14100 (a)	Closed	N	147
3608803	6924647	Maine Drilling & Blasting - Mid-Atlantic	Birdsboro Quarry	9715765	575189	03/10/23	06/03/23	03/10/23	50.30(a)	Closed	N	143
3608803	6924647	Maine Drilling & Blasting - Mid-Atlantic	Birdsboro Quarry	9715766	575189	03/10/23	06/03/23	03/10/23	50.30(a)	Closed	N	143
1800030	6898335	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9669825	563453	08/04/22	10/23/22	08/04/22	50.30(a)	Closed	N	133
1800030	6898335	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9669826	563453	08/04/22	10/23/22	08/04/22	50.30(a)	Closed	N	133
3600276	6923211	Maine Drilling & Blasting - Mid-Atlantic	LINCOLN STONE	9668694	561425	07/19/22	09/28/22	07/19/22	56.4201(a)(2)	Closed	N	133
3608548	6899521	Maine Drilling & Blasting - Mid-Atlantic	Plumstead Materials	9667130	557488	05/04/22	08/04/22	05/04/22	56.4203	Closed	N	133
3608187	6893879	Maine Drilling & Blasting - Mid-Atlantic	Fiddlers North Quarry	9523776	535379	04/08/21	06/26/21	04/08/21	56.20011	Closed	N	125

1800030	6892471	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9527127	533620	02/24/21	05/29/21	02/24/21	58.62	Closed	N	125
1800030	6892471	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9527128	533620	02/24/21	05/29/21	02/24/21	56.14101 (a)(2)	Closed	Y	125
3607480	6820053	Maine Drilling & Blasting - Mid-Atlantic	MIDDLEPORT MATERIALS INC.	9521236	511494	02/12/20	05/02/20	02/13/20	56.14100 (b)	Closed	N	135
3608548	6815134	Maine Drilling & Blasting - Mid-Atlantic	Plumstead Materials	9419682	502463	09/13/19	04/14/20	10/31/19	56.6306(e)	Closed	Y	1,242
3600143	6817388	Maine Drilling & Blasting - Mid-Atlantic	Harleysville Materials	9463154	500371	08/14/19	10/30/19	08/14/19	50.30(a)	Closed	N	121
3600143	6817388	Maine Drilling & Blasting - Mid-Atlantic	Harleysville Materials	9463155	500371	08/14/19	10/30/19	08/14/19	50.30(a)	Closed	N	121
3600143	6817388	Maine Drilling & Blasting - Mid-Atlantic	Harleysville Materials	9463156	500371	08/14/19	10/30/19	08/14/19	50.30(a)	Closed	N	121
1800030	6759068	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9416213	480011	11/06/18	01/25/19	11/06/18	47.41(a)	Closed	N	118
1800030	6758647	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9367651	467333	05/02/18	08/20/18	05/02/18	50.30(a)	Closed	N	118
1800030	6758647	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9367652	467333	05/02/18	08/20/18	05/02/18	50.30(a)	Closed	N	118
1800030	6758647	Maine Drilling & Blasting - Mid-Atlantic	Elk Mills Quarry	9367653	467333	05/02/18	08/20/18	05/02/18	50.30(a)	Closed	N	118
3605666	6756994	Maine Drilling & Blasting - Mid-Atlantic	FULKROAD QUARRY	9317065	451285	09/05/17	11/27/17	09/05/17	50.30(a)	Closed	N	116

Electricity Transmission

ISO-NE PAC MEETING

05/18/2023

Adams #21 Substation Relocation

nationalgrid

Outline

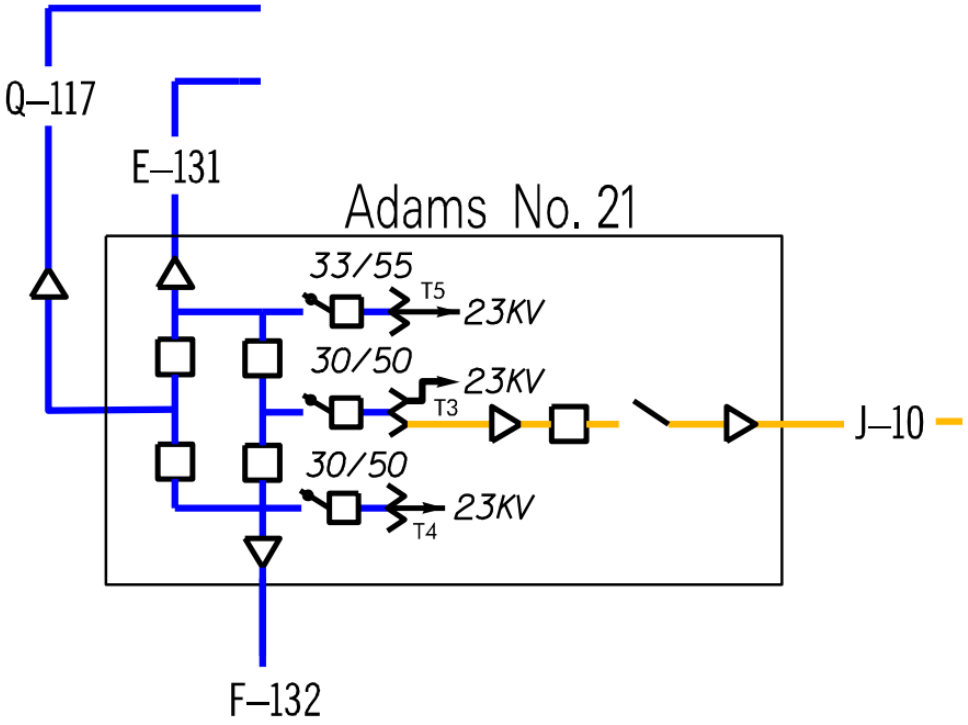
Purpose: Discuss the proposed solution for flood mitigation at Adams #21 in Adams, MA

- Aerial View
- Existing Substation One-Line Diagram
- Substation Asset Condition
- Substation Stone Dust & Flood Concerns
- Substation & Equipment Elevation
- Environmental Constraints
- Substation Concerns' Pictures
- Options Analysis
- Proposed Solution
- Proposed Substation One-Line Diagram
- Proposed Substation Layout
- Questions

Aerial View

This document has been reviewed and does not contain Critical Energy/Electric Infrastructure Information (CEII).

Existing Substation One-Line Diagram



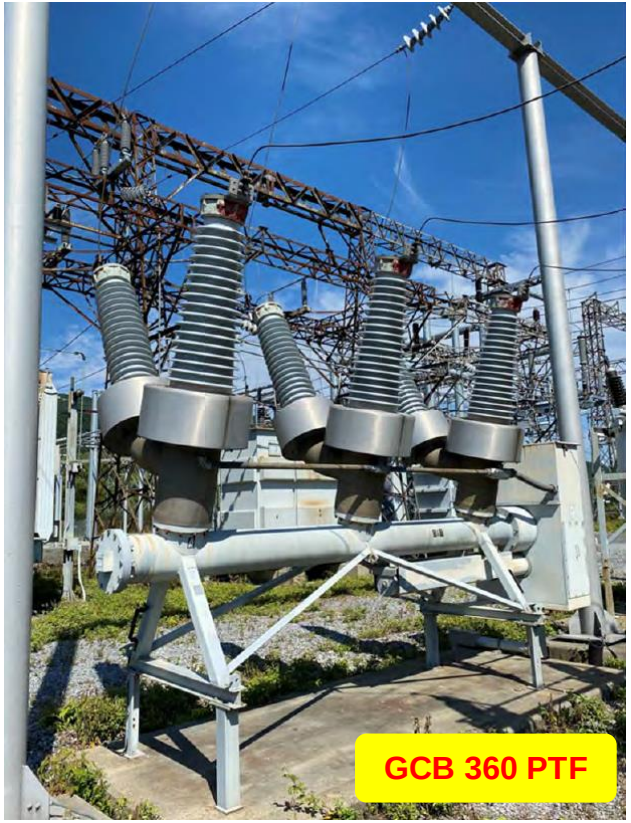
This document has been reviewed and does not contain Critical Energy/Electric Infrastructure Information (CEII).

Substation Asset Condition

- Adams substation was built in 1917 and in 1960's 115kV sources were added. It consists of 115kV, 69kV, 23kV, 13kV assets, and serves over 18,200 customers
- T3 115kV transformer was installed in 1963 with no secondary oil containment. Recent inspection showed nitrogen leak around the flange
- T4 115kV transformer was installed in 1991, vintage surge arresters need to be replaced

Substation Asset Condition, Cont'd

- 69kV gas circuit breaker was manufactured in 1998 and installed in 2002, recent inspection highlighted hydraulic and SF6 issues
- 69kV Switches 3T69, 361, 911 were installed in 1973 and difficult to maintain and operate
- 23kV equipment bus, breakers, cable trays and switches have had numerous asset concerns often operating in excess humidity and stone dust contamination
- Deteriorated control cables due to site condition, high ground water table combined with cycles of freezing and thawing damage control cables in Trenwa or cable trays
- Equipment operated under environmental conditions of excess humidity and stone dust beyond their recommended specifications



Substation Stone Dust & Flood Concerns

- The existing substation is in wetland area and adjacent to Hoosic River, within 100-year FEMA flood zone
- In close proximity to an active lime quarry exposing equipment to excess amounts of stone dust
- New study has shown river is encroaching the site boundaries due to a new meander formation
- Access limitation and operational concerns during a flooding event (i.e., 2007, 2014, 2015, 2018 floods)

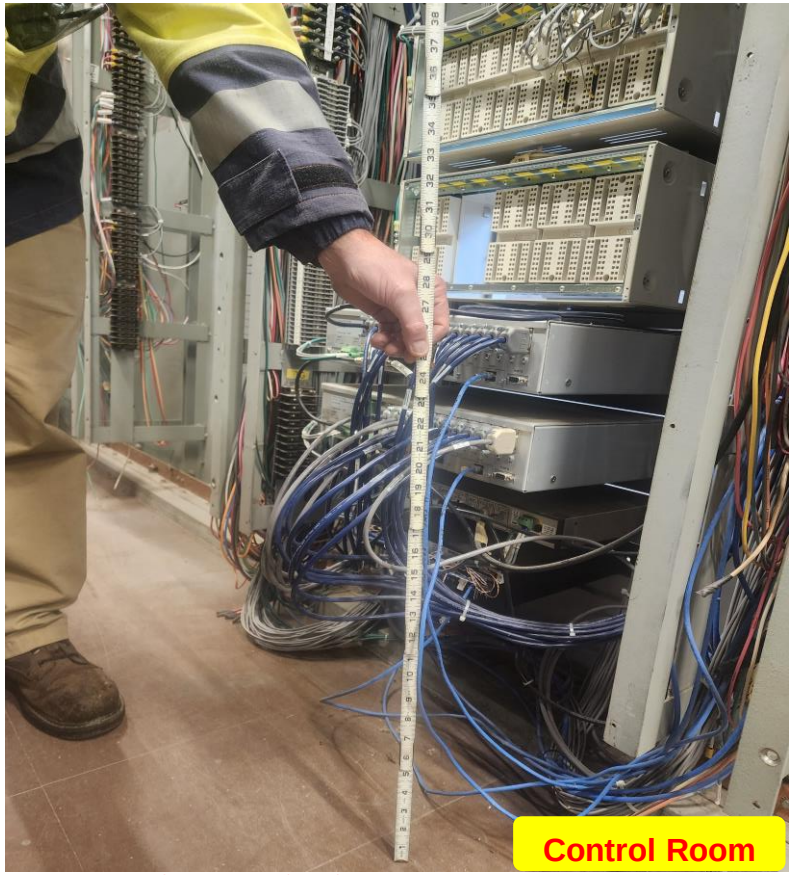
This document has been reviewed and does not contain Critical Energy/Electric Infrastructure Information (CEII).

Substation Stone Dust & Flood Concerns, Cont'd

- Substation has flooded several times and resulted in equipment failure (circuit breakers flashover) & loss of all 18,200 customers for durations ranging from 2-7.5 hours.
  - To date, only distribution equipment has failed due to flooding, and vacuum breakers seem to be the most impacted by humidity and dust

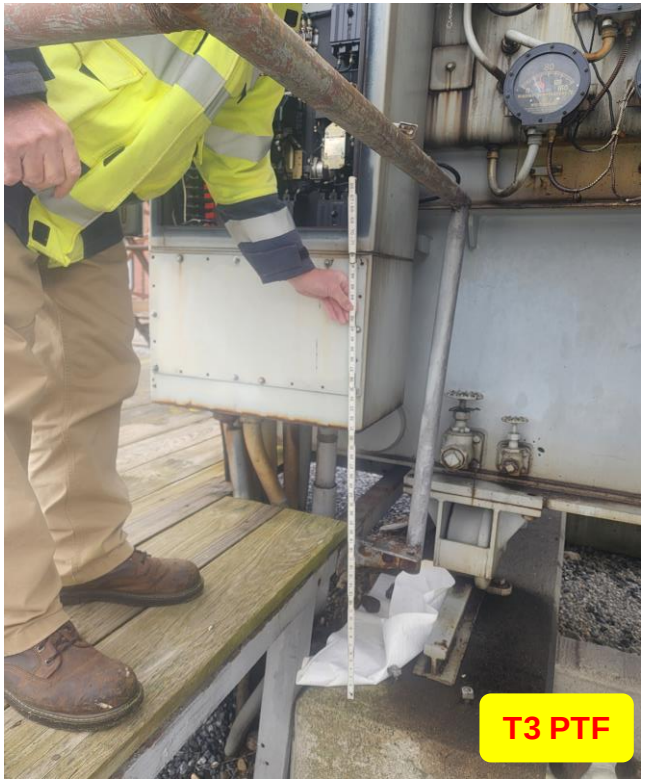
Substation & Equipment Elevation

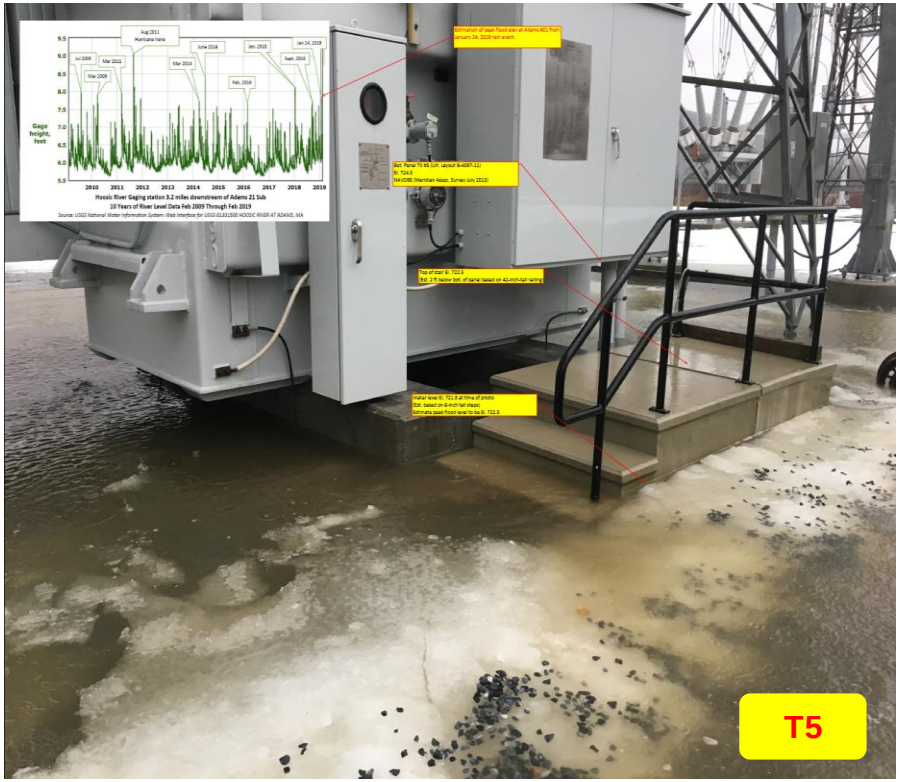
- Substation elevation: 718’ – 721’ above sea level
- FEMA 1983 100-year elevation: 722’ to 723’ , adjusted 100-year & 500-year peak flood after hydrologic study by GeoEnvironmental Inc (GZA): 723’3” & 725’
- Control room floors are at 722’11” and 721’10” elevations. A 100-year flood here would result in ~ 4” and 18” water, a 500-year flood would be at ~ 28” and 42”
  - Most of the control panels have been installed on the floor, so flooding the control room would short-circuit multiple pieces of equipment, including relays, resulting in the loss of protection on major equipment



Substation & Equipment Elevation, Cont'd

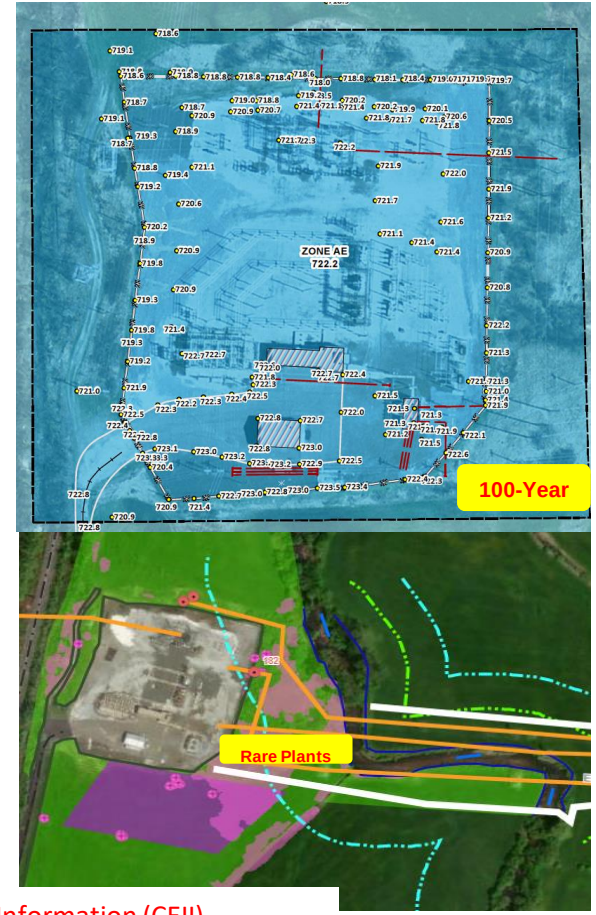
- Sensitive transmission equipment panel elevations in the yard range from 723'8" – 726'; however, over 75% of them are installed under 725'





Environmental Constraints

- Substation is within 100-year flood zone, surrounded by wetlands, rare plants and wetland mitigation areas on all sides (except access).
- Substation site considered at High Risk for extreme participation and riverine flooding events by the Resilient MA Action Team's Climate Resilience Design Standard Tool (EOEEA).
- Maintenance projects are heavily scrutinized by regulatory agencies given these constraints.
- Any modifications to "future-proof" the substation to increase resilience from more frequent flooding/climate impacts would undergo significant agency scrutiny and require detailed alternatives analysis, including the evaluation of alternate sites.



This document has been reviewed and does not contain Critical Energy/Electric Infrastructure Information (CEII).

Substation Concerns' Pictures

This document has been reviewed and does not contain Critical Energy/Electric Infrastructure Information (CEII).

Substation Concerns' Pictures, Cont'd

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Substation Concerns' Pictures, Cont'd

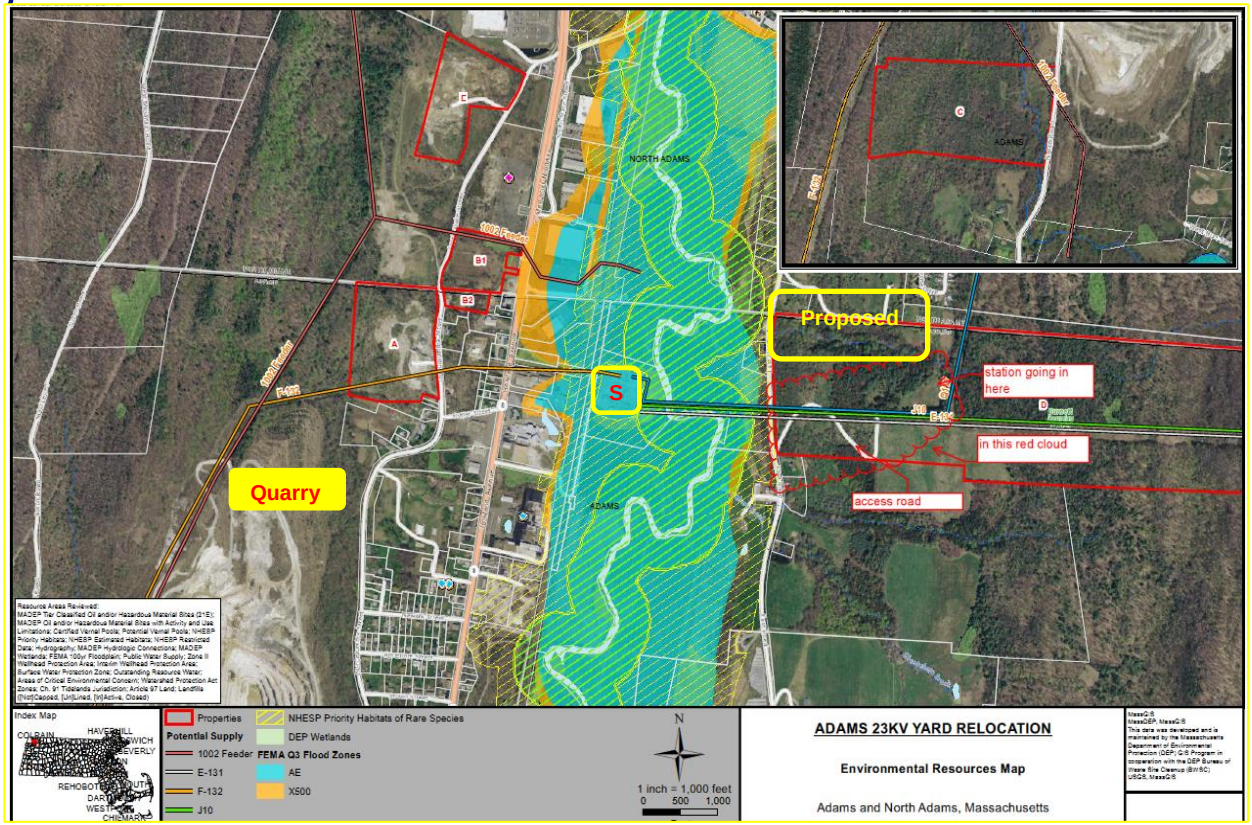
This document has been reviewed and does not contain Critical Energy/Electric Infrastructure Information (CEII).

Options Analysis

- Raise/rebuild of impacted equipment at the existing location was ruled out due to flood plain constraints (as noted in slide 11)
- Perimeter barriers were ruled out due to environmental constraints.
  - The agencies, MassDEP and the Natural Heritage & Endangered Species Program in particular, are highly sensitive to the repetitive impacts that have occurred in this area. A detailed alternative analysis would be required and scrutinized.
  - Given the high groundwater table adjacent to and within the substation, it's likely that groundwater will still inundate the substation during storm events given the permeable nature of the ground conditions

Options Analysis, Cont'd

- Alternative site analysis was completed. Over a dozen parcel locations were considered, but ruled out due to the following criteria:
  - Engineering constraints
  - Real-estate availability
  - Environmental constraints
  - Proximity to a quarry and its adverse pollution impact on the equipment
  - New ROW requirements
  - Costs
- The proposed site satisfied all the above-mentioned criteria



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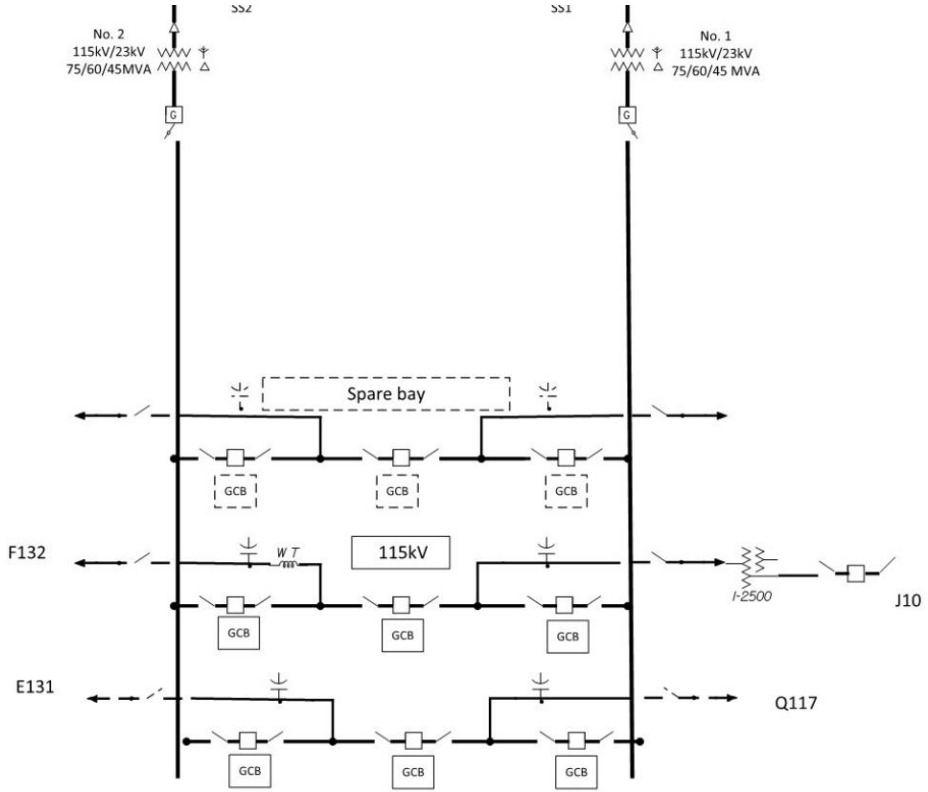
Proposed Solution

Relocate substation to a higher elevation and install new assets:

- Preferred location: 1640 Church St, North Adams, elevation between 2,585’ - 3,155’
- Install new assets for each yard and reroute the overhead line in and out of the new location
- Major new assets include:
  - Two 115kV bays of 115kV 3000 Amp tubular aluminum bus
  - Six 123kV 3000 Amp gas circuit breakers, one 69kV vacuum circuit breaker
  - One 115kV/69kV/14kV Auto with tertiary 30/40/50 MVA transformer, two 115kV/23kV 45/60/75 MVA delta/grounded Y power transformers
- Expected in service date will be the first quarter of 2030
- Existing substation will be removed, stabilized and allowed to revegetate
- 115kV T5 and breakers will be kept as spares, a few line structures will be reused for F-132 or D-Lines to the new location and the rest will be removed
- Total T&D Project Cost $133.5M (+50/-25%), $55.1M PTF

Proposed Substation One-Line Diagram



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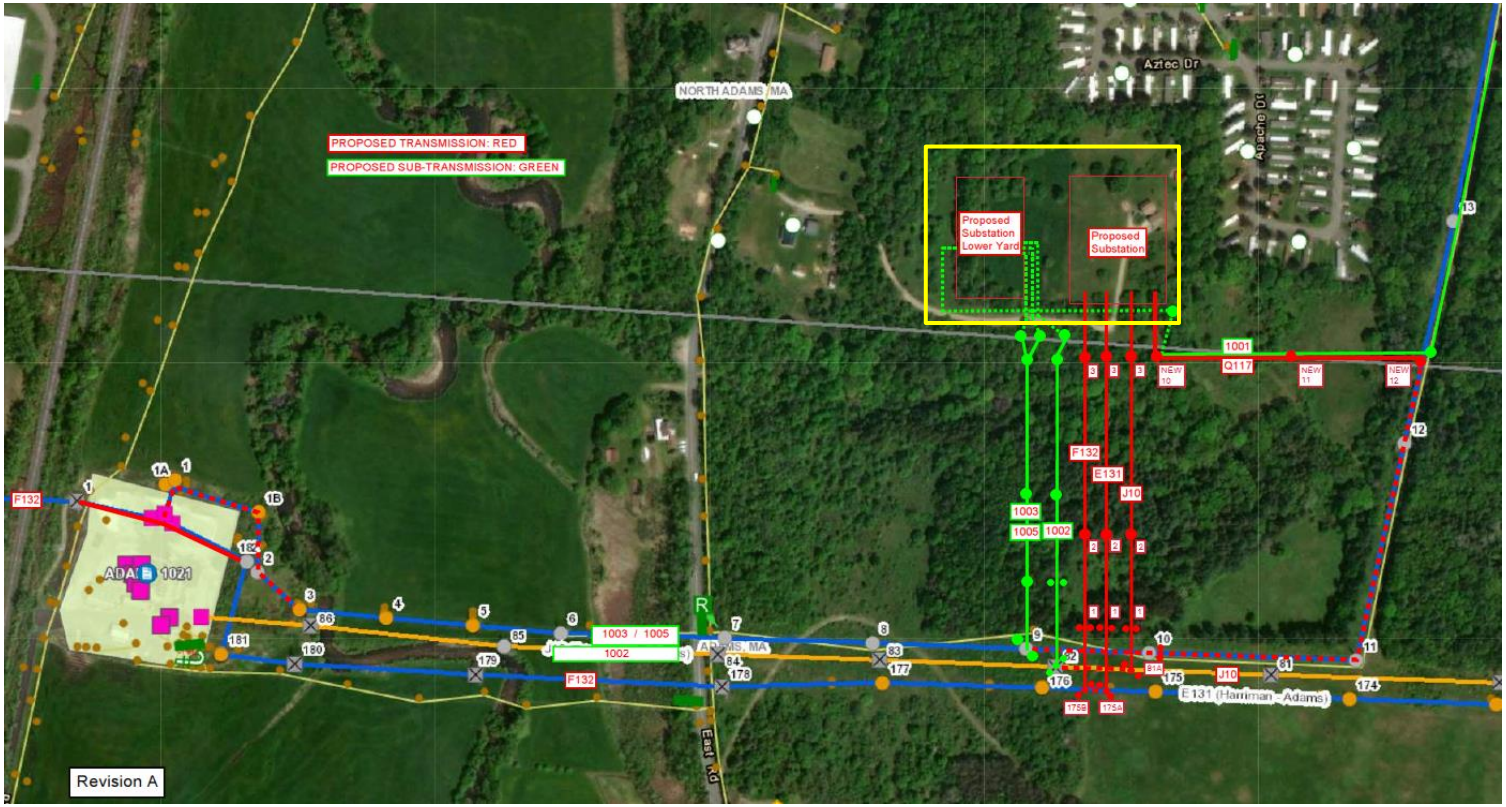
Proposed Substation Layout



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DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

TO ACCOMPANY MAP I-1524

BEDROCK GEOLOGIC MAP OF THE OLD MYSTIC AND PART OF THE MYSTIC QUADRANGLES, CONNECTICUT, NEW YORK AND RHODE ISLAND

By Richard Goldsmith

Prepared in cooperation with
THE STATE OF CONNECTICUT
GEOLOGICAL AND NATURAL HISTORY SURVEY

INTRODUCTION

Most of the bedrock of the Mystic and Old Mystic quadrangles is part of an upper Proterozoic gneissic, crystalline terrane extending from eastern Massachusetts through western Rhode Island to and across southeastern Connecticut north of Long Island Sound. This terrane, equated with the Avalonian terrane of Newfoundland (Rast and others, 1976; Skehan and Murray, 1980), is separated from a block of metamorphosed volcanic and sedimentary rocks of Ordovician or older age, the Quinebaug and Tatnic Hill Formations, by the ductile, north- and west-dipping Honey Hill–Lake Char fault system which crosses the northern part of the Old Mystic quadrangle (figs. 1 and 2). The crystalline terrane, in the lower plate, consists predominantly of granitoid gneisses, the Sterling Plutonic Group of Late Proterozoic age (Day and others, 1980; Goldsmith, 1980), that intrude and are interleaved with a layered sequence consisting of the predominantly metaclastic Plainfield Formation below and the primarily metavolcanic and metaplutonic Waterford Group above. Regional metamorphism probably took place in the early Paleozoic and possibly in the Proterozoic, but metamorphic events continued, at least in the upper plate, during the middle Paleozoic. In the Silurian, the laccolithic Preston Gabbro was intruded in the developing Honey Hill fault zone. During the middle and into the late Paleozoic, deformation continued both along the Honey Hill fault zone and in the gneissic terrane, where it produced a major foliation arch and a complex interference pattern.

Late in the Paleozoic, late- to post-tectonic granite and quartz monzonite, including the Westerly and Narragansett Pier Granites, were intruded in the coastal area of Rhode Island and Connecticut. During the Mesozoic, brittle faulting accompanied by hydrothermal activity occurred in a north-south zone from Mystic River through the Preston Gabbro area. The prominent silexite mass at Lantern Hill formed at this time.

The bedrock in the map area is partly covered by glacial deposits of Pleistocene age (Gaffney, 1966; Upson, 1971). Accordingly, bedrock exposures are discontinuous and irregularly distributed. South of the mainland, Fishers Island, Wicopesett Island (not shown on this map), Napatree Point, and Sandy Point are composed of thick unconsolidated glacial deposits, and no bedrock information could be obtained.

ROCKS OF THE LOWER PLATE

Stratified Rocks

Plainfield Formation

The Plainfield Formation in the New London area was divided into three parts (Goldsmith, 1976) on the basis of mapping in the Thames River area to the west: (1) an upper partly calcareous quartzitic-pelitic section, (2) a middle, largely quartzo-feldspathic and calcareous section, and (3) a lower quartzitic and pelitic section. In the Old Mystic and Mystic quadrangles, only the upper and middle parts are represented. Thick beds of quartzite and pelitic schist and gneiss and sillimanitic quartzite typical of what was called the lower Plainfield in the Uncasville and Montville quadrangles (to the west) are not observed in the Old Mystic and Mystic quadrangles. This is attributed to the general eastward plunge of the structure off the Montville dome (fig. 2). The boundary of the Plainfield Formation with the overlying Mamacoke Formation is drawn at the top of the uppermost thick section of quartzite. The section exposed in the northeast corner of the map near Wyassup Lake is continuous from primarily metavolcanic rocks (**Zh, Za**) into a transitional zone of mixed metavolcanic and metaclastic rocks (**Zmhq**) within which is gray biotite-plagioclase gneiss (**Zmb**). These rocks pass downward concordantly into a sequence of gray biotitic quartzite, slightly calcareous quartzite, and quartz-biotite pelite assigned to the Plainfield Formation (**Zp**). The latter rocks are typical of rocks mapped as the upper part of the Plainfield in the New London area. Quartzite adjacent to the Mamacoke Formation usually contains thin layers of quartz-bearing amphibolite. In the Mystic quadrangle, this can be seen in the undivided Plainfield Formation (**Zp**) in the Bindloss Brook area, and in the Old Mystic quadrangle, in the undivided Plainfield Formation (**Zp**) in the Bindloss Brook area and at North Stonington, and in quartzite (**Zpq**) on the north side of Wyassup Lake. The Plainfield Formation in the southern part of the area contains fewer metavolcanic rocks and more quartzitic rocks than to the north, and it is possible that the boundary of the Plainfield with the Mamacoke Formation has been drawn higher in the section in the south. Part of the Plainfield may be stratigraphically equivalent to the hornblende gneiss and quartzite (**Zmhq**) of the northern part of the area. Amphibolite in the Plainfield section south of Wyassup Lake and at Pitcher Mountain (**Zpa**) is interpreted as lenses of mafic volcanics in the section rather than tectonic slices or infolds of rock normally higher in the section.

Calc-silicate quartzite and gneiss (Zpc) form a distinctive unit that, in the Uncasville quadrangle, was considered to lie near the base of the middle part of the Plainfield. The calc-silicate quartzite could be interpreted as equivalent stratigraphically to less coarsely recrystallized calcareous quartzites in the upper part of the Plainfield in the northern belt. However, as mapped, it appears to be down in the section. It is noteworthy that this rock in most places lies adjacent to or in granite gneiss throughout most of the New London area. The significance of this is not apparent.

Waterford Group

The distinctive formations recognized in the quadrangles to the west that have been assigned to the Waterford Group (Goldsmith, 1980) are not recognized as such in the Old Mystic and Mystic quadrangles, except for the gray biotite-plagioclase gneiss of the Mamacoke Formation (Zmb). The more mafic parts of the Waterford Group in the Old Mystic quadrangle, as exposed east and west of the Preston Gabbro, are probably equivalent stratigraphically to parts of the New London Gneiss and Rope Ferry Gneiss (previously called Monson Gneiss) of the Niantic-New London areas (Goldsmith, 1967 c,d). The hornblende-biotite gneiss (Zh, sample 19 of table 1,) resembles Rope Ferry Gneiss in composition. In the northern Old Mystic quadrangle, volcanic and volcaniclastic rocks are more abundant and plutonic rocks are less abundant than in the New London-Mystic belt of metavolcanic and metaplutonic rocks. The partly quartzitic unit (Zmhq) could be equivalent to the upper part of the Mamacoke in the Niantic-New London area, but if so distinctive layers, such as a light-colored rock containing quartz-sillimanite ellipsoids, a blocky amphibolite, and a garnet-rich biotite sillimanite rock, seem to be missing. However, facies could have changed between the two areas, particularly if as expected in a palinspastic reconstruction, the two areas were originally far apart.

The bulk of the Mamacoke Formation in the Mystic and Old Mystic quadrangles is an indistinctly layered (hornblende)-biotite-quartz-plagioclase gneiss (tables 1 and 2) with a few dark layers of amphibolite and light-colored layers of alaskite and biotite granite gneiss. The interlayering with alaskite is suggestive of a sequence of layered intermediate and felsic volcanic rocks. Good exposures of this sort of layering can be seen in ledges northwest of Wyassup Lake, on the south slopes of Swantown Hill, and on Conn. Rte 184 west of Old Mystic.

Some biotite gneiss of the Mamacoke is difficult to distinguish in the field from phases of the Potter Hill Granite Gneiss (compare samples 17 and 13, of table 1, and sample 4 of table 2). The boundary between biotite gneiss (Zmb) of the Mamacoke Formation and the adjacent Potter Hill is indistinct in the Copps Brook area north of Pequot Trail and in the faulted area west of Whitford Pond. The biotite gneiss in the Lee Brook area was mapped as fine to medium-grained granite gneiss in the adjacent Uncasville quadrangle. Possibly the biotite gneiss is an earlier, potassium-poor phase of the Potter Hill, or conversely the Potter Hill is potash-feldspar enriched, mobilized biotite gneiss. Indeed, Foye (1949, p. 61) considered the Mamacoke a phase of the "Sterling orthogneiss" and derived from "Monson orthogneiss" by infiltration of "Sterling batholithic solutions." If the biotite gneiss of the Mamacoke is a metaplutonic rock rather than a metavolcanic rock, its stratigraphic position is not reliable, and its use in interpreting the structure of the area is limited.

The biotite gneiss of the Mamacoke (Zmb) becomes increasingly less layered, more coarsely crystalline and more granitoid southward in the Mystic quadrangle, giving the appearance of having been melted and homogenized. It passes into a relatively homogeneous hornblende-biotite gneiss of granodioritic composition (Zmhb, samples 5 and 6 of table 2). Because of its fairly uniform mineral composition, the granodioritic gneiss (Zmhb) may have been an intrusive phase in the volcanic pile before metamorphism. Both phases of the Mamacoke Formation were mapped by Moore (1967) in the Watch Hill quadrangle to the east as "metavolcanic rocks." I have mapped the Mamacoke Formation in the Old Mystic and Mystic quadrangles as a metavolcanic unit.

The hornblende gneiss and amphibolite (Zha) in the southeastern corner of the Old Mystic quadrangle and near North Stonington is considered to be a more highly recrystallized and deformed equivalent of the hornblende gneiss and the amphibolite (Zh and Za) in the Preston Gabbro area (north-central part of map). It does, however, contain some rock types, including a rusty semipelitic gneiss not recognized in the latter area. It also lacks the ubiquitous alaskitic layers of the northern units that serve to distinguish the rocks of the Waterford Group from those of the Quinebaug Formation.

Plutonic Rocks

Sterling Plutonic Group

The Hope Valley Alaskite Gneiss (Zhv) forms thick to thin sheets intercalated with the other rocks of the basement complex. Large sheets are clearly intrusive into the Plainfield Formation, but small layers are less clearly intrusive. In the northwest belt near the Honey Hill fault zone, the Hope Valley on the whole is finer grained than elsewhere and appears to be melded into the adjacent layers through cataclasis and recrystallization (ductile flow). The Hope Valley contains less biotite and is less calcic where it is adjacent to quartzite of the Plainfield (sample 9 of table 1) than where it forms layers in the more biotitic Mamacoke Formation (sample 8 of table 1). The white, fine-grained Hope Valley (Zhvf) is not greatly different mineralogically from normal Hope Valley, but has a more sugary aspect in outcrop and is slightly more plagioclase-rich. Slight differences in composition of the Hope Valley could be attributable to contamination by the different host rocks that it intrudes.

It is possible that the thin alaskitic layers in the Waterford Group are extrusive equivalents of the intrusive sheets in the Plainfield Formation. Possibly some or all of the Hope Valley represents extrusive sheets that have been remobilized. The Potter Hill Granite Gneiss (Feininger, 1965) is the most extensive single rock type in the quadrangle. The Potter Hill on Gallup Hill is the rock mapped in the Uncasville and Montville quadrangles to the west as biotite granite gneiss (Goldsmith, 1976a,b) The more coarsely-grained augen granite gneiss (Zpha) between Yawbucs Brook and Ryder Road (northeast part of map) was mapped as a unit separate from the Potter Hill. However, except for the porphyritic aspect, the rocks are not dissimilar in composition and texture, and phases similar to the augen gneiss crop out in a few small areas within the Potter Hill. A similar mass was mapped as inequigranular gneiss near Gales Ferry in the adjacent Uncasville quadrangle (Goldsmith, 1967a).

Permian Granites

The Permian granites are characterized by intrusive habit, igneous textures, lack of metamorphism, and chemically by the relative abundance of rare earth elements, modally expressed by allanite (table 1). The lenses of Narragansett Pier Granite (Pnp) in the Old Mystic quadrangle are west of a larger mass exposed in the type area of Westerly, Rhode Island. In the Old Mystic quadrangle, the Narragansett Pier tends to have been emplaced paraconcordantly to the trends of the folliation in the host rocks; however, in a few places, the granite is clearly discordant. The dikes of Westerly Granite are everywhere clearly discordant and are considered to be slightly younger than the Narragansett Pier Granite as it is in the type area (Quinn, 1971).

The porphyritic quartz monzonite (Pqm) is a unique rock that has not been previously reported in the region. Its consanguinity to the Narragansett Pier Granite is not only suggested by the chemistry and habit, but also because biotite-poor phases approach the Narragansett Pier in texture. This is most clearly seen in the small masses west of Long Pond.

ROCKS OF THE UPPER PLATE

Stratified rocks

Quinebaug and Tatnic Hill Formations

The Quinebaug Formation in the Old Mystic quadrangle is not divided into the subdivisions established by Dixon in the Plainfield and Danielson quadrangles to the north (Dixon, 1965, 1968) because the Quinebaug is disrupted by intrusion of gabbro and by faulting. Although the Quinebaug contains rock types similar to those in the upper Waterford Group, the two can be distinguished fairly readily by the common thinner layering, more diverse composition, and lack of alaskitic layers in the Quinebaug.

Only the lower part of the Tatnic Hill Formation (OZt) is present in the northwest corner of the map, and it appears to be conformable with the Quinebaug Formation here because the two appear to be intercalated in the contact zone. However, to the north in the Jewett City quadrangle, units of the Quinebaug are missing along the contact, and the contact is interpreted to be a fault (Dixon, 1983).

The Tatnic Hill and Quinebaug Formations are considered to be either Ordovician or Late Proterozoic in age on the basis of regional correlations and isotopic age determinations (Goldsmith and others, 1982). The possibility that they are no younger than Cambrian (Goldsmith, 1980, p. A100) is discounted.

Intrusive Rocks

Preston Gabbro

The Preston Gabbro and related phases in the Old Mystic quadrangle are satellitic to a much larger mass to the north in the Jewett City quadrangle. The poorly exposed diorite (Spd) at the quadrangle boundary west of Cossuduck Road is the southern tail of the main mass. The Preston Gabbro has been studied by Loughlin (1912), Sclar (1958), and more recently mapped by Dixon (written commun., 1976, 1968). Sclar considered the gabbro to be a west-dipping laccolith. Magnetic and gravity data support this interpretation. Griscom and Bromery, (1968, p. 426) indicate that the general form of the pluton is a nearly circular basin-like mass, now tilted down to the west. In the Old Mystic quadrangle, the gabbro masses most likely represent separate intrusions related to the upper part of the main mass althouth they may be, in part, faulted blocks of the upper part of the main mass. Sclar described the bulk of the gabbro as an ophitic to subophitic clinopyroxene gabbro and quartz clinopyroxene gabbro. Dixon (1978) describes the interior of the gabbro as olivine - two-pyroxene gabbro and the upper part as a quartz-hornblende diorite. Most of the rock in the Old Mystic quadrangle however, is hornblende gabbro containing only relic pyroxene (table 1). The igneous texture is well preserved where not transformed by shearing. Chemically, the phases of the gabbro form a consanguinous series (Goldsmith, unpublished data). The late granodioritic phase, in places trondhjemitic, is at the top of the main mass in the Jewett City quadrangle to the north (Dixon, 1978) and dikes of trondhjemite are numerous near the east edge. A trondhjemite dike cutting diorite in the Jewett City quadrangle has been dated by R. E. Zartman, measuring Pb-U isotopes in zircon, at about 423 m.y. (R. E. Zartman, written commun., 1979). The gabbro is clearly intrusive into the previously metamorphosed Quinebaug Formation. Where gabbro becomes sheared in the Honey Hill fault zone, coarse-grained hornblende is recrystallized to fine-grained hornblende forming amphibolite that is not readily distinguishable from amphibolite of the Waterford Group or Quinebaug Formation.

METAMORPHISM

The entire map area is within the sillimanite-muscovite zone of metamorphism except in the northwest corner of the Old Mystic quadrangle where the Tatnic Hill Formation and part of the Quinebaug Formation are in the sillimanite-potassium feldspar zone of metamorphism. Diagnostic minerals for grade of metamorphism in the rocks of the lower plate are mainly in the Plainfield Formation. Sillimanite is the principle index mineral. Calc-silicate quartz schist contains diopside and bytownite near Burnetts Corner, and some calc-quartzites contain clino-pyroxene and labradorite in several places. All the rocks older than the Preston Gabbro have undergone pervasive regional dynamothermal metamorphism. Pervasive deformation of the rocks below the Honey Hill fault has occurred at elevated temperatures, and two main phases of deformation and recrystallization are indicated: one forming the primary foliation and the other folding this foliation and, in places, forming a second foliation which seems to have obliterated the first in zones of strong shear.

Retrogressive metamorphism has occurred only along the fault systems. Deformation along the Honey Hill fault zone was essentially at dry amphibolite-facies conditions. The primary effect of this deformation was in reducing the grain size of the rocks by comminution of the consistuent minerals. Only where the Lantern Hill fault system is superimposed on the Honey Hill zone is there extensive and pervasive development of chlorite, epidote, and secondary muscovite. Mica from a slickensided fault surface at Lantern Hill was shown by x-ray analysis to be a mixed layer illite-muscovite.

STRUCTURE

The distribution of units in the map area indicates a complex fold and fault interference pattern. Major structural features are a central, doubly-plunging foliation arch, the Potter Hill dome; a paraquaquaversal basin, the Mystic basin; a complexly folded and sheared zone on the south limb of the antiform, the Mystic node; a refolded secondary antiform, the Mystic antiform, the Honey Hill ductile fault zone; and the Lantern Hill brittle fault system. Relation of the structures in the Mystic and Old Mystic quadrangles to the surrounding region is indicated in figure 2.

The gneisses, schists, and quartzites of the basement complex have a primary foliation (S_1) which is metamorphic in the stratified rocks and a metamorphic foliation or syntectonic flow-foliation in the plutonic rocks. This foliation is apparently related to regionally developed isoclinal folds now with inclined to recumbent axial surfaces (F_1). The foliation has been refolded pervasively by flexural flow-folds (F_2) forming a foliation arch with moderately to steeply inclined axial surfaces (S_2). Continued or later folding (F_{3+}) with upright axial surfaces produced the present configuration. Mesoscopic isoclinal folds (F_1) in which primary foliation is axial planar to folded layering are rare, and these, indicated by combined isoclinal fold symbol and foliation symbol, were seen primarily in the northern belts of the Waterford Group and Plainfield Formation, as in the quartzite along Yawbucs Brook southwest of Wyassup Lake. The predominant folding in the quadrangle (F_2) involves both foliation and layering in the stratified rocks and gneissosity in the older plutonic rocks, and is related to development of the major foliation arch. In many places, particularly in the southern part of the area, two generations of foliation (S_1 and S_2) can be discerned in an outcrop.

The presence of early recumbent isoclinal folds (F_1) is based on an interpretation of the regional stratigraphy and minor structures and on map pattern (Dixon and Lundgren, 1968). The Potter Hill dome is apparently superposed on an early anticline which is the eastward extension of the Montville dome (Goldsmith, 1967b) and Selden Neck dome (Lundgren, 1963). The width of the outcrop area of the Mamacoke Formation in the Mystic quadrangle is interpreted as resulting from a thickening on the crest of an early recumbent fold, an extension of the refolded Hunts Brook syncline (Goldsmith, 1961). Mesoscopic tight isoclinal folding of the Plainfield seen in many exposures suggests that this formation is isoclinally folded. Megascopically, the pattern of mapped quartzite across Cossaduck Hill to North Stonington also suggests this if the sills of Hope Valley Alaskite Gneiss are disregarded. However, such folds are speculative and are not shown on map or cross sections.

The dominant F_2 folds are readily apparent. The south-verging Potter Hill foliation arch brings up in its core the Potter Hill Granite Gneiss. On its northern flank is an antiform - synform set that is also anticlinal and synclinal. The configuration of folds on the steep south flank of the arch is more complex. The arch is best illustrated in section *D–D"* and *E–E'*. The complication of the Mystic basin and the complicated folds of the Mystic node are illustrated in sections *A–A"*, *B–B'*, *C–C'*.

Development of the Potter Hill foliation arch occurred at a time when temperatures were high and the rocks responded plastically. The plastic behavior is more evident to the south than to the north where the arrangement of formations is planar rather than disharmonic. Flexural flow-folds (F_2) on the northern limb of the foliation arch show a rotation sense mostly north over south, but locally in the opposite sense. Minor folds plunge to northwest to the west and northerly to the east although plunges of recognizable first generation folds (F_1) are variable. Minor folds (F_2) on the crest and southern limb plunge in a more pronounced east-west direction. In the southern limb, the axial surfaces of minor folds are inclined steeply both to north and south. Drag sense is predominantly up from the south. This is well illustrated in the zone from Wheeler Brook and Merritt Hill south into the Mystic quadrangle. The steeply-dipping south flank of the arch is characterized by tight folding west of the Mystic River and in the Taugwank synform. Plunges of folds in this area are quite variable and locally steep. Folded fold axes are common.

The Mystic node is a complex zone of tight folding and shearing. It would appear that the Mamacoke Formation south of the Mystic basin is backfolded and that the Plainfield Formation in the Bindloss Brook area is inverted. The Plainfield here is interpreted as occupying an F_1 anticlinal hinge as is the narrow belt of Plainfield Formation in the Pequot Trail area. The zone in the Bindloss Brook area appears to terminate southward along an annealed northeast to east-west trending shear.

The Mystic antiform is south-verging like the Potter Hill antiform and bears a similar pattern of minor drag folds. Axial surfaces of small folds in foliation and layering dip predominantly to the north, but flatten toward the crest of the antiform and dip more gently than the overall dip of the long limbs of the folds south of the crest. This is most clearly seen in the area around Silvias Pond. In places, a second foliation marked by orientation of biotite flakes has developed parallel to the axial surfaces of the minor drag folds.

The Mystic antiform has been folded near Stonington by a northeast-trending fold which as folded the crest and steep limb of the older antiform. The fold at Stonington may reflect drag along a major northeast-trending fault or shear zone, having right lateral offset that lies in the adjacent Ashaway and Watch Hill quadrangles to the east (Feininger, 1965; Moore, 1967; Smith and Barosh, 1980).

A fold with similar style, but with opposite sense is located in the Noank area. This fold may actually be superimposed on a tightly appressed synform complementary to the Mystic antiform. An antiformal area between the Stonington and Noank folds may be present in the Mason Island-Quiambog Cove sector. Minor folds related to this phase of folding are evident primarily in the coastal area. The abrupt spooning of the Noank fold suggests a later northwest-trending antiform offshore to the southeast. The Mystic basin is an obvious product of superimposed folding.

Zones of shear are prominent in the map area. Overturned limbs of minor folds of the F_2 generation have been sheared off, but it is not clear that this is true for the major folds. These zones of shear show no cataclasis and such shears are recognized by abrupt changes in trend of foliation along a narrow zone, usually with some evidence of drag, and in places by abrupt juxtaposition of rock units across the zone. The shear in the Bindloss Brook area and the shear in the Copps Brook area east of Quoketaug Hill and north of the Pequot Trail are good examples of such features. This shear may curve southward to become the north side of the Mamacoke-Plainfield contact along Pequot Trail as interpreted, or it may somehow pass southwestward to join the shear south of Bindloss Brook in the northwest Mystic quadrangle. The Copps Brook shear projects eastward in a zone of vertical foliation in the south limb of the Potter Hill antiform. It or another shear concealed in the foliation to the south may project eastward south of Merrit Hill into the Ashaway quadrangle to become the discordance shown by Feininger (1965) extending from Ashaway east-southeastward along the Pawcatuck River. However, the Copps Brook shear is interpreted as connecting near Harvey Road with a inferred shear southeast of Long Pond, clearly expressed in the foliation pattern in the Potter Hill Granite Gneiss. A shear is interpreted between the Mamacoke and Plainfield Formations south of the Haleys Brook; to the east it swings northerly an undetermined distance around the east side of the Mystic basin. A shear could be interpreted along the north side of the Mamacoke Formation in the Long Pond belt to accommodate discordancies and missing section east and west of the quadrangles (fig. 2). For lack of conclusive evidence, however, a shear at this locality has not been shown on this map.

Plunges of minor folds and trends of foliation indicate that both horizontal and vertical components of movement have been involved in and along the zones of shear. Steep plunges are abundant in the east-plunging Taugwank synform north of Pequot Trail. The pattern of deformation southeast and south of the Mystic basin clearly involves folding of a disharmonic nature coupled with plastic deformation and movement of folded semi-coherent blocks against one another along fairly discrete movement planes. As no cataclasis is evident, deformation apparently took place at high temperature as a flowage phenomenon.

Places in which the gneissic foliation has been folded by drag along the locus of non-foliated seams of granite several millimeters in width and as much as several meters long are relatively abundant in the gneisses of the coastal area. The seams have a predominant northwest trend, but neither horizontal nor vertical displacement seems to be consistent over the area. The seams are observed only in outcrop and in places form conjugate sets bounding edges of blocks of rock that have moved slightly with respect to each other. The seams must have formed at a time when the rocks were at or near temperatures at which partial melting could take place. They deform folded foliation but are cut sharply by aplite and pegmatite dikes related to the Narragansett Pier and Westerly Granites.

Honey Hill Fault

Minor structural features on either side of the Honey Hill fault are clearly discordant as is most clearly seen on the northwest corner of the map. Rock units above the fault zone are broken into slices and blocks whereas units below the fault zone have a marked parallelism. Within the fault zone, units are lenticular and truncated at low angles. Major foliation trends south of the fault roughly parallel the fault and are continuous northward into the fault zone. Also, the grain size of the rocks becomes finer towards the fault zone although not everywhere consistently, until eventually layers of laminated blasto-mylonite and mylonite are reached. This is a strong indication that the deformation along the Honey Hill fault was distributive and produced by the same stress field that controlled the foliation pattern in the rocks of the lower plate. Presumably in this case, the deformation would coincide with the development of the foliation arch (F_2). However, foliation is variably folded in partly cataclastic rock units near the Honey Hill fault zone and the inference is that this foliation is F_1 and that the folding and movement along the fault was F_2 and was in part metamorphic and continued after or late in the development of the foliation arch (F_2) to the south. Several investigators have observed that the Honey Hill fault has had a long history (Lundgren and Ebblin, 1972; Sclar, 1958; Wintsch, 1979; Dixon, 1978).

Axial planes of minor folds in the area of the northeast-trending segment of the Honey Hill fault zone, as northeast of Ashwillet Brook, tend to be oriented in a northwesterly direction. Here axial planes are fairly gently-dipping and axes plunging northward. Movement sense is northeast over southwest. Further southeast toward Wyassup Lake, normal northeast orientation is prevalent. Two sets of folds of foliation are evident in places, the northwest set later than

the northeast set. This northwest orientation is approximately axial planar to the great right-angled bend in the regional trend around the Preston Gabbro and may be related to this flexure. In many places, and east-over-west rotation is indicated in minor folds in the mylonite zone. This led Lundgren and Ebblin (1972) to postulate that the Honey Hill fault represented a zone along which the cover rocks (Quinebaug and Tatnic Hill Formations) slid westward off the rising basement complex to the east and south. This may indeed have occurred, but is considered to be a late stage of movement. Vergence in the foliation arch is to the south and east.

Lantern Hill Fault

The Lantern Hill fault system is a zone of north-south trending brittle fracture accompanied by silicification and hydrothermal alteration. Branches of the fault cut through the Preston Gabbro, but the main trace is shifted to the northeast following the Honey Hill Fault zone so that the fault becomes the north-trending normal fault east of the gabbro shown by Dixon (1965, written commun., 1979) paralleling the north-trending ductile Lake Char fault. The Preston Gabbro presumably acted as a resistant knot and the Honey Hill-Lake Char system offered an easier locus for fracture. Mylonitic rocks are clearly cut by and altered along the Lantern Hill fault system. The faults in Phelps Brook west of Cossaduck Hill are based on apparent offsets of units and by the presence of outcrops of brecciated rock along the valley walls, most noticeably in ledges of Hope Valley Alaskite Gneiss. The faults cutting the Indiantown Road ridge north of Iron Street were similarly determined. Vein quartz and slickensides flank the Lantern Hill fault in the Mystic River, along Whitford Brook, and along the fault in the Mystic Reservoir.

Displacement along the fault system increases from south to north. Control for the amount of movement is poor in the Mystic River area, but appears to be about 100 m of stratigraphic throw. Stratigraphic throw using the top of the Wintechog Hill belt of alaskite gneiss across Lantern Hill is about 420 m, but measured from the east of the eastermost fault cutting Wintechog Hill is only about 250 m. The sense of movement on the fault system east of Lantern Hill suggests that a partial graben having blocks dropping down towards Lantern Hill, but having marked uplift east of Lantern Hill. The quartz mass appears to have been deposited in a strain shadow or zone of tension south of the resistant gabbro. A complex down-dropped block athwart the main trend of the Lantern Hill fault is evident south and southwest of Prentice Mountain (north-central). The silicified rock north of Ayer Hill is probably part of the Lantern Hill system where it is dispersed through the gabbro.

The Lantern Hill fault is post-Permian in age as it is younger than the Narragansett Pier and Westerly Granites. It is probably Triassic or Jurassic in age based on analogy to other silicified north-trending faults in New England (Rodgers, 1970, p. 107, 111). Aleinikoff (1978) has dated a lamprophyre dike cutting a silicified zone in southern New Hampshire as Jurassic in age.

Joints

The predominant trend of joints is north-south, but joints to northeast and northwest trend strike are present locally. The main joint trend and the variations in the trend can be readily determined by looking at the topography as expressed on the map.

GEOLOGIC HISTORY

Regional metamorphism of the gneissic basement and the allochthonous cover rocks north of the Honey Hill fault probably occurred in the early Paleozoic (Zartman and others, 1965; Pignolet and others, 1980). However, there is considerable evidence, both inferential and from isotopic dating, that an episode or episodes of middle Paleozoic metamorphisms affected the rocks of the upper plate at least (Pignolet and others, 1980) and involved the Honey Hill fault zone and perforce the Preston Gabbro. The Preston Gabbro has been deformed and partly recrystallized in the zone of ductile deformation along the Honey Hill fault zone, but is clearly younger than the regional metamorphism of the surrounding rocks. According to Dixon (1978), the gabbro contains inclusions of mylonite.

The plastic deformation during development of the foliation arch calls for temperatures near minimum melting conditions. Regional heating during the late Paleozoic (see Lundgren, 1966) prior to and during emplacement of the Narragansett Pier Granite could approach these conditions. The plastic nature of the deformation (F_2) is increasingly obvious to the south, which is apparently the direction of increased temperatures. The coastal area of Rhode Island and Connecticut is also the zone of emplacement of the Permian granites. Cooling must have been rapid, however, for dikes of Westerly Granite cut all earlier metamorphic fabrics.

The development of the foliation arch (F_2) occurred prior to the emplacement of the Permian-Westerly Granite. The emplacement of the Narragansett Pier Granite may not have been much later than the development of the foliation arch. The semi-concordant nature of masses of this rock suggest structural control for their emplacement at the time when temperatures were somewhat elevated. In the Uncasville quadrangle to the west, undeformed pegmatite of a type related to the Narragansett Pier Granite cuts blastomylonitic alaskite gneiss giving a minimum age for ductile faulting along the Honey Hill fault.

Using the above observations, the following history can be reconstructed:

1) Late Proterozoic—Deposition of the Plainfield Formation and the overlying Waterford Group in a developing volcanic environment. Intrusion of associated hypabyssal and plutonic rocks. Possible deposition elsewhere of Quinebaug and Tatnic Hill Formations.

2) Ordovician—Deposition of the Quineburg and Tatnic Hill Formations in a developing trench west of the map area followed by regional metamorphism including deformation of the trench and margins leading to development of nappe structures and movement of Putnam block into juxtaposition with the Waterford–Sterling block along the Honey Hill fault zone.

3) Silurian throuth Carboniferous—Emplacement of Preston Gabbro as a sheet into the Honey Hill fault zone. Continued movement of the Honey Hill fault zone and deformation of the Preston Gabbro, and development of foliation arch at at time when isotherms were higher to the south than to the north.

4) Permian—Late to post-tectonic emplacement of the Narragansett Pier and Westerly Granites near the end of a period of high heat flow.

5) Triassic and Jurassic—Regional cooling and uplift. Tensional, brittle faulting and hydrothermal activity producing the Lantern Hill fault zone.

6) Cretaceous to present—Gradual uplift and erosion.

ECONOMIC RESOURCES

The Westerly Granite has been used for dimension stone, particularly monumental granite, but none of the dikes of Westerly in the Mystic and Old Mystic quadrangles are large enough to be of economic value at present. The Narragansett Pier Granite has also been used for dimension stone, primarily in buildings, but is doubtful if any of the masses in the Old Mystic quadrangle are of sufficient size for economical quarrying. The Potter Hill Granite Gneiss, the Hope Valley Alaskite Gneiss, and phases of the Mamacoke Formation are a source of stone for foundations and for rip-rap. Rock from the large abandoned quarry of Mamacoke hornblende biotite gneiss at the northwest end of Mason Island was used as rip-rap for breakwaters in the Stonington area. Fine-grained phases of the Hope Valley Alaskite Gneiss, particularly near the Honey Hill fault, and some mylonitic rocks such as the felsic mylonite might be suitable for crushed stone. Where not too greatly folded, thin-bedded quartzite might be used for flagstone, facing stone, and in garden walls.

Silica is being mined at Lantern Hill for use in bottle glass because of its purity, primarily its low iron content. The soft, porous, vein quartz is the rock principally mined because of its ready crushability.

The Narragansett Pier and Westerly Granites have a noticeably higher radioactivity than other granites and granite gneisses of the region (Goldsmith and others, 1977). This is probably attributable to higher thorium content than the other rocks. The Permian granites in these quadrangles are too small in size, however, to be considered a source of radioactive materials.

REFERENCES CITED

Aleinikoff, J. N., 1978, Structure, petrology, and U-Th-Pb geochronology in the Milford (15') quadrangle, New Hampshire: Hanover, N. H., Dartmouth College, Ph. D. thesis.

Day, H. W., Brown, V. M., and Abraham, Kurt, 1980, Precambrian(?) crystallization and Permian(?) metamorphism of hypersolvus granite in the Avalonian terrane of Rhode Island: Geological Society of America Bulletin, Part II, v. 91, p. 1669–1741.

Dixon, H. R., 1965, Bedrock geologic map of the Plainfield quadrangle, Windham and New London Counties, Connecticut: U.S. Geological Survey Geologic Quadrangle Map GQ–481, scale 1:24,000.

_____ 1968, Bedrock geology of the Danielson quadrangle, Windham County, Connecticut: U.S. Geological Survey Geologic Quadrangle Map GQ–696, scale 1:24 000.

_____ 1978, Polystage deformation in eastern Connecticut: Geological Society of America Abstracts with Programs, v. 10, p. 40.

Dixon, H. R., and Lundgren, L. W., Jr., 1968, Structure of eastern Connecticut, *in* Zen, E-an, White, W. S., and Hadley, J. B., eds., Studies of Appalachian geology—northern and maritime: New York, Wiley Interscience, p. 219–230.

Dixon, H. R., and Felmlee, J. K., 1983, Bedrock geologic map of the Jewett City quadrangle, London County, Connecticut: U.S. Geological Survey Geologic Quadrangle Map GQ–1575, scale 1:24,000.

Feininger, Tomas, 1965a, Bedrock Geologic Map of the Ashaway quadrangle, Connecticut–Rhode Island: U.S. Geological Survey Geologic Quadrangle Map GQ–403, scale 1:24,000.

_____ 1965b, Bedrock geologic map of the Voluntown quadrangle, New London County, Connecticut, and Kent and Washington Counties, Rhode Island: U.S. Geological Survey Geologic Quadrangle Map GQ–436, scale 1:24,000.

Foye, W. G., 1949, The geology of eastern Connecticut: Connecticut Geological and Natural History Survey Bulletin 74, 100 p.

Gaffney, J. W., 1966, Glacial geology of the Old Mystic quadrangle, New London County, Connecticut: Amherst, Mass., University of Massachusetts, M.S. thesis.

Goldsmith, Richard, 1961, Axial-plane folding in southeastern Connecticut: U.S. Geological Survey Professional Paper 424–C, p. 54–57.

_____ 1967a, Bedrock geologic map of the Uncasville quadrangle, New London County, Connecticut: U.S. Geological Survey Geologic Quadrangle Map GQ–576, scale 1:24,000.

_____ 1967b, Bedrock geologic map of the Montville quadrangle, New London County, Connecticut: U.S. Geological Survey Geological Quadrangle Map GQ–609, scale 1:24,000.

_____ 1967c, Bedrock geologic map of the Niantic quadrangle, New London County, Connecticut: U.S. Geological Survey Geologic Quadrangle Map GQ–575, scale 1:24,000.

_____ 1967d, Bedrock geologic map of the New London quadrangle in Connecticut: U.S. Geological Survey Geologic Quadrangle Map GQ–574, scale 1:24,000.

_____ 1976, Pre-Silurian stratigraphy of the New London area, southeastern Connecticut, *in* Page, L. R., ed., Contributions to the stratigraphy of New England: Geological Society of America Memoir 148, p. 271–276.

_____ 1980, Stratigraphic names in the New London area, southeastern Connecticut.—A revision: *in* Sohl, N. F. and Wright, W. B., Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1979: U.S. Geological Survey Bulletin 1502–A, p. 91–103.

Goldsmith, Richard, Wones, D. R., and Shride, A. F., 1982, Stratigraphic names in eastern Massachusetts: U.S. Geological Survey Bulletin 1529H, p. 57–72.

Goldsmith, Richard, Zietz, Isidore, and Dixon, H. R., 1977, Correlation of aeroradioactivity and geology in southeastern Connecticut and adjacent New York and Rhode Island: Geological Society of America Bulletin, v. 88, p. 925–934.

Griscom, Andrew, and Bromery, R. W., 1968, Geologic interpretation of aeromagnetic data for New England, *in* Zen, E-an, White, W. S., and Hadley, J. B., eds., Studies of Appalachian geology—northern and maritime: New York, Wiley Interscience, p. 425–436.

IUGS Subcommission on the Systematics of Igneous Rocks, 1973, Plutonic rocks —Classification and nomenclature recommended by IUGS Subcommission on the Systematics of Igneous Rocks: Geotimes, v. 18, no. 10, p. 26–30.

Loughlin, G. F., 1912, The gabbros and associated rocks at Preston, Connecticut: U.S. Geological Survey Bulletin 492, 158 p.

Lundgren, L. W., Jr., 1963, The bedrock geology of the Deep River quadrangle: Connecticut Geological and Natural History Survey Quadrangle Report 13, 39 p.

_____ 1966, Muscovite reactions and partial melting in southeastern Connecticut: Journal of Petrology, v. 7, p. 421–453.

Lundgren, L. W., Jr., and Ebblin, Claude, 1972, Honey Hill fault in eastern Connecticut.—Regional relations: Geological Society of America Bulletin, v. 83, p. 2773–2794.

Moore, G. E., Jr., 1967, Bedrock geologic map of the Watch Hill quadrangle, Washington County, Rhode Island and New London County, Connecticut: U.S. Geological Survey Quadrangle Map GQ–655.

Pignolet, Susanne, Grant, N. K., and Hickman, M. H., 1980, Rb/Sr geochronology of the Honey Hill Fault area, eastern Connecticut: Geological Society of America Abstracts with Programs, v. 12, p. 77.

Quinn, A. W., 1971, Bedrock geology of Rhode Island: U.S. Geological Survey Bulletin 1295, 68 p.

Rast, Nicholas, O'Brien, B. H., and Wardle, R. J., 1976, Relationship between Precambrian and lower Paleozoic rocks of the Avalon Platform in New Brunswick, the northeast Appalachians and the British Isles: Tectonophysics, v. 30, p. 315–338.

Rodgers, John, 1970, The tectonics of the Appalachians: New York, Wiley Interscience, 271 p.

Sclar, C. B., 1958, the Preston Gabbro and the associated gneisses, New London County, Connecticut: Connecticut State Geological and Natural History Survey Bulletin 88, 136 p.

Skehan, J. W., and Murray, D. P., 1980, A model for the evolution of the eastern margin of the Appalachians, *in* Wones, D. R., ed., Proceedings, The Caledonides in the USA, International Caledonides Project 27: Dept. of Geological Sciences, Virginia Polytechnic Institute and State University Memoir 2, p. 67–72.

Smith, P. V., and Barosh, P. J., 1980, Fracture and intrusive tectonics along the Watch Hill fault zone in southwest Rhode Island: Geological Society of America Abstracts with Programs, v. 12, p. 84.

Snyder, G. L., 1961, Geologic map of the Norwich quadrangle, Connecticut: U.S. Geological Survey Geologic Quadrangle Map GQ–144, scale 1:24,000.

_____ 1962, Petrochemistry and bedrock geology of the Fitchville quadrangle, Connecticut: U.S. Geological Survey Bulletin 1161–I, p. I1–I63.

Upson, J. E., 1971, Surficial geologic map of the Mystic quadrangle, Connecticut, New York, and Rhode Island: U.S. Geological Survey Geological Quadrangle Map GQ–940, scale 1:24,000.

Wintsch, R. P., 1979, Recent mapping in the Chester area, Connecticut, and its bearing on the Chester syncline: Geological Society of America Abstracts with Programs, v. 11, p. 60.

Zartman, R. E., Snyder, G. L., Stern, T. W., Marvin, R. F., and Buckman, R. C., 1965, Implications of new radiometric ages in eastern Connecticut and Massachusetts: U.S. Geological Survey Professional Paper 525–D, p. D1–D10.

TABLE 1.—Selected modal analyses[1] of rocks from the Old Mystic quadrangle, Connecticut

			Preston Gabbro					Sterling Plutonic Group								Waterford Group				
Rock unit	Pnp	Pqm	Spg	Spg	Spd	Spqd	Spgd	Zhv	Zhv	Zhvf	Zhv	Zhvf	Zph	Zph	Zpha	Zmb	Zmb	Zmb	Zh	Za
Field number	(1203)	(1422)	(1139)	(1106)	(1042)	(1084)	(1051)	(1063)	(1301)	(1488)	(1418)	(1266)	(1299)	(1365)	(1400)	(907b)	(907c)	(1062)	(1473)	(927b)
Sample number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17[4]	18	19[5]	20[6]
Quartz	26	16	—	0.2	<5	8	32	36	38	30	36	35	38	34	37	28	32	35	23	0.2
Plagioclase	35	39	31	40	43	59	41	35	32	42	31	33	32	32	32	55	48	48	50	43
Microcline	30	40	—	—	—	—	12	25	38	25	27	27	25	25	24	4	15	7	0.5	—
Biotite	6	3	—	—	5	3	10	2	+	1	4	5	4	8	6	9	4	8	13	12
Hornblende	—	1	65	56	32	19	—	—	—	—	—	—	—	—	—	2	—	—	11	43
Magnetite/ilmenite	1	0.3	4	0.3	9	3	0.7	0.5	1	1	0.7	0.4	—	0.5	0.5	0.8	0.8	0.8	0.2	1
Sphene	—	0.3	+	0.1	—	0.9	0.9	—	—	0.6	—	—	—	—	—	0.3	—	0.1	0.2	1
Apatite	0.3	0.1	—	0.1	5	0.4	0.2	+	—	+	+	+	0.1	0.1	0.2	0.4	0.2	0.2	0.2	0.3
Allanite	0.4	0.4	—	—	—	—	0.2	—	—	0.1	—	—	—	—	—	0.1	—	—	—	—
Zircon	0.1	—	—	—	—	—	—	0.1	0.7	+	—	—	—	—	—	+	0.1	+	—	—
Muscovite	0.8	—	—	—	—	—	0.3	1	+	—	1	0.1	0.2	0.4	0.1	—	0.1	0.4	—	—
Chlorite	0.1	—	0.1	2.6	—	4	—	+	—	—	—	—	0.3	0.3	—	—	0.3	0.3	—	—
Epidote	—	—	—	0.7	0.5	2	2	—	—	—	—	—	—	—	—	—	—	—	2.2	—
Other[2]	0.2[c]	—	—	—	+[r]	—	—	+[g]	—	+[r]	—	—	—	0.1[m]	—	+[r]	+[r]	0.4[c]	—	—
Approximate anorthite component of plagioclase[3]	22	14	53	55	38	38	43	12	5	7	15	23	22	1	25	n.d.	15	1	40	40

[1] Each mode is based on one thin section. Over 1,100 points counted per thin section; —, not present; + present but not among points counted.
[2] Other: c, calcite; g, garnet; m, monazite; r, rutile.
[3] ol, oligoclase; n.d., not determined.
Anorthite content determined by extinction angles measured in grains oriented perpendicular to a.
[4] Light-gray gneiss layer.
[5] Cataclastically deformed.
[6] Amphibolite with scattered light-colored feldspathic spots.

TABLE 2.—Selected modal analyses [1] of rocks from the Mystic quadrangle, Connecticut

Rock unit	Zmb	Zmb	Zmg	Zmb[2]	Zmhb	Zmhb	Zmhb[3]	Zma	Zhv	Zhv	Pw	Zp[4]
Field number	(800b)	(815a)	(847)	(762)	(843d)	(837a)	(896)	(852)	(853)	(845)	(841)	(823)
Sample number	1	2	3	4	5	6	7	8	9	10	11	12
Quartz	35	29	29	35	23	32	27	5	40	44	20	45
Plagioclase	50	48	65	35	54	45	37	38	32	29	48	28
Microcline	1	8	2	23	8	12	30	—	25	26	22	2
Biotite	13	10	3	6	8	7	5	—	2	0.8	8	24
Hornblende	—	3	—	—	5	2	—	53	—	—	—	—
Pyroxene	—	—	—	—	—	—	—	2	—	—	—	—
Magnetite/ ilmenite	0.3	0.9	0.7	0.1	1.0	1	0.1	0.4	0.1	0.1	0.4	0.4
Sphene	T	0.2	0.2	—	0.3	0.2	0.5	0.6	—	—	0.4	—
Apatite	—	0.4	0.2	0.1	0.2	0.4	0.2	0.5	T	—	0.3	0.2
Allanite	0.2	0.1	—	—	—	0.1	0.2	—	—	—	0.1	—
Zircon	T	0.1	T	T	—	T	—	T	—	T	0.1	T
Muscovite	—	0.1	0.1	—	—	—	—	—	—	0.2	0.1	—
Calcite	—	0.5	—	—	—	—	—	T	—	—	0.1	—
Garnet	—	—	—	—	—	—	—	—	T	—	—	T
Rutile	—	—	—	—	—	—	—	—	—	—	—	0.2
Approximate anorthite component of plagioclase	28	26	15	23	28	24	24	39	12	10	25–16[5]	26

[1] Each mode is based on one thin section. Over 1,100 points counted per thin section; —, not present; T, trace.
[2] Granitoid layer.
[3] Granitoid layer.
[4] Biotite-plagioclase-quarta gneiss layer in Plainfield Formation; a fairly abundant rock type in the Plainfield Formation.
[5] Plagioclase has oscillatory zoning, but overall has a more calcic core and less calcic shell.