

VII. AIR POLLUTION

A. Proposed Findings of Fact Regarding Air Pollution

551. Particulate matter pollution consists of very small liquid and solid particles floating in the air. Of greatest concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. These particles are less than 10 microns in diameter (about 1/7th thickness of a human hair). (Cross of Guldberg)
552. The term "PM 10" means coarse particulate matter measuring less than 10 microns in diameter. (Cross of Guldberg)
553. The term "PM 2.5", which is a subset of PM 10, means fine particulate matter measuring less than 2.5 microns in diameter. (Cross of Guldberg)
554. Rivers' air expert, Mr. Guldberg, estimated that of the PM 10 particles, 10% will be in the PM 2.5 subset.
555. A range of 10-20% is typically used for estimating the amount of PM 2.5 as a percentage of PM 10. (Cross of Guldberg). Conservative worst case modeling would require using the 20% factor.

556. Mr. Guldborg could not provide a rationale for using the 10% factor for estimating PM 2.5 instead of the more conservative 20% factor.
557. Rivers use of the 10% estimate puts the project just barely in compliance with the 24-hour National Ambient Air Quality Standard (NAAQS) for PM 2.5 at the rock wall.
558. If the more conservative estimate of 20% PM 2.5 is used, the project would be out of compliance with the 24-hour National Ambient Air Quality Standard (NAAQS) for PM 2.5 at the rock wall.
559. The quarry will be in the business of selling crushed rock.
560. Rivers proposes to have stockpiles of crushed rock at various locations.
561. Mr. Guldborg assumed that there will be no wind erosion emissions from the crushed rock stockpiles.
562. Mr. Guldborg based that assumption upon his understanding that the "storage piles will be located below grade in the quarry pit where they will be shielded from wind gusts and water spray will be applied as necessary to prevent wind erosion emissions." (R-87, p. "B-2").
563. Wind erosion emissions are air emissions.
564. The location of the crushed rock stockpiles has not been specified by Rivers.
565. When stone is crushed, there is a byproduct called filings.
566. Rivers has not addressed the storage or treatment of the filings.
567. If the piles were not of crushed rock, but were instead piles of fine dry particles, that would increase wind erosion air emissions.
568. Smaller particles are blown around by lower speed wind gusts than larger particles.
569. Increased wind erosion is a cause of increased air emissions.

570. The quarry will contain a number of sources of fugitive air emissions.
571. Rivers proposes to control these fugitive air emissions through wet suppression, i.e., by spraying water on the air emission sources. (R-87, p. "B-2")
572. Fugitive particulate matter emissions are a type of air emissions.
573. Wet suppression means spraying water on the dusty areas.
574. Rivers plans to store or dispose of sediment dredged from the pond's forebay in piles within the quarry pit.
575. The dredged sediment will be composed largely of sand, silt and rock flour.
576. When that dredged sediment dries out, it will be a pile of fine dry particles.
577. When the dredged sediment dries out, it will create dust.
578. Fugitive air emissions from the piles of dredged sediment were not considered by Rivers' air expert.
579. Mr. Guldborg did not study the climatology of the valley where the proposed quarry would be operating.
580. Mr. Guldborg was not aware of the frequency or duration of inversions or fog in the vicinity of the proposed quarry. Neighbor Ben Sanders testified from personal experience about the frequency and duration of air inversions in the vicinity of the proposed quarry.
581. Mr. Guldborg acknowledged that the data he obtained from the Underhill air monitoring station is not representative of the Mad River Valley topology or climatology.
582. Mr. Guldborg did not study the effects of dust from trucks leaving the haul road along Route 100B and how the dust would affect the neighbors.

583. There are no current sources of diesel exhaust and dust at the proposed quarry site. (Cross Exams of Roger Dickinson, Gunner McCain and Peter Guldberg. Direct testimony of Ben Sanders)
584. A dusty or polluted atmosphere around the neighborhood does not currently exist, except for the relatively little amount of dust and pollution generated by traffic on Route 100B and smaller area roads. There are no heavy industrial uses in this portion of the Mad River Valley. (Testimony of Arthur Hendrickson).
585. Each and every vehicle accessing the proposed quarry is new traffic as it relates to the impact on the neighborhood. Neighbors will hear quarry traffic (including customers' trucks) slowing down, turning into the site and grinding their way up the steep haul road producing substantial noise and diesel exhaust. (Ben Sanders Testimony and N-31)
586. Heavy trucks generate large amounts of smoke and fumes from their exhaust as they try to accelerate, substantially more than when they are cruising by at 50 mph. (Ben Sanders direct testimony & N.31)
587. The Applicant's expert did not study the impact of the prevalent weather conditions in the Valley which includes frequent air inversions that impact air quality. Instead, he relied on data from Underhill VT, which has different topography, climatology and experiences fewer and shorter duration inversions. (December 16, 2008 Cross exam of Peter Guldberg by Geoff Hand & Rivers Exhibit R87 Pg 10)
588. Air inversions, heavy fog, and low lying clouds are a frequent occurrence in the Mad River valley. During the spring, fall and winter the inversions can be seen and their effect smelt when Neighbors' chimney smoke moves sideways and down instead of up. When it's not heating season, inversions are apparent by the smell of exhaust from

vehicles on 100B that stays close to the ground. (Testimony of Ben Sanders January 14th 2009 & N.31)

589. Fog or low lying clouds occur more often than clear mornings in the valley. The Neighbors see it roll in during late afternoon/early evening and it often does not burn off until mid-morning. On inclement days it can stay around all day. (Testimony of Ben Sanders January 14th 2009, N.31 and photos of fog in N.10)
590. On these frequent inversion days, exhaust from 100B stays low to the ground. When we take into account all of the new traffic visiting the proposed quarry and that one of the expected peaks will be early morning as stated by the applicant's traffic expert as well as the 9-minute 50-second impact per truck it is clear that the diesel exhaust will stay close to the ground affecting the quality of the Sanders' air and that of the closest Neighbors (the Holdens, Byrne/Farley, McMullins, Hendricksons and Porters). (Roger Dickinson direct testimony, Traffic Report Exhibit R-5, Page 4 final paragraph, Ben Sanders Direct Testimony and Exhibit N.31)
591. The Neighbors' air quality will suffer from the diesel exhaust that the trucks and equipment on the proposed quarry would generate. Diesel exhaust is a known carcinogen and smells bad. The Moretown Zoning Regulations §§ 4.10 (A) and (B)(4) protect the Neighbors from this adverse impact. (Note- these 4.10 sections do not state the phrase 'undue' adverse – just adverse). (Ben Sanders Direct Testimony and Exhibit N.31)
592. The proposed quarry will have multiple off-road diesel and dust sources including a drill, crusher, screener, excavator, loader, and a water truck with a significant number of days where some if not all equipment will be running for 10 hours:

- a) the crusher that was specified for the project is rated at running about a thousand yards a day so at 75,000 yards annual production, there will be about 75-90 days out of the 35 week operating season that the crusher will be running.
- b) "5 to 6 days of drilling per blast. With 10 to 12 blasting events, 60 to 70 days of drilling over the 35 week operating season. The drilling and crushing, will be concurrent activity with some regularity, except when the drilling would need to take plus above the crusher.

(Rivers' Exhibit R-2 pg. 7 #5; direct Testimony and cross exam of Gunner McCain February 12, 2008)

593. The impact of truck traffic on air quality is as follows:

- a) Rivers does not dispute that there will be 54 trucks accessing the site to pick up stone on a maximum day. This does not include service or employee vehicles. (See Exhibit R-5 Pg. 4).
- b) Due to weight limitations on trucks there will either have to be more trucks per day or more maximum days per season than estimated by the Applicant in order to reach 75K cubic yards of material. (See Exhibit N-1 Pg.3 and Direct Testimony of Michael Oman February 22, 2008)
- c) Rivers does not dispute that the approximate time for a truck to decelerate, enter the haul road, ascend and descend the haul road, exit the haul road and attain 50 mph is 4 minutes 50 seconds. During this time, the trucks will be accelerating, decelerating, climbing or descending the haul road. ***It is during these operations that trucks produce the maximum of noise and air pollution including fine particulates due to higher revving engines, higher power output and fuel consumption, and "Jake braking" on the descent and deceleration.*** By contrast, a truck at steady highway speed, while far from free of impacts, has far less impact on its surroundings including properties and neighbors. (See Exhibit N-1 Pg 7)
- d) Rivers does not dispute that it takes generally about five minutes by the time the truck passes over the scales, gets loaded and gets back to the scales. (Roger Dickinson testified at the April 18, 2006 hearing and this fact was included in Exhibit N-1 Pg 7 and Michael Oman's testimony on February 22, 2008)

- e) Rivers does not dispute that during the period described in (d) above, the loader is working at its full capacity producing diesel exhaust. (Ben Sanders Testimony January 14, 2009)
- f) Rivers does not dispute that the impact time per truck is 9 minutes 50 seconds when you add Oman's and Dickinson's times together. (Ben Sanders Testimony January 14, 2009 & N10 Page 2)
- g) Rivers does not dispute that using the Applicant's 54 customer truck daily maximum, the total daily diesel air impact is 8.85 hours for just these trucks. Approximately half this time will include the maximization of pollution as described above in item c. The other half of the time the trucks are idling, the loader is running at full capacity, and other quarry equipment are operating. (Ben Sanders Testimony January 14, 2009 & N10 Page 2)

594. The proposed haul road as well as the staging area are approximately 225 feet from the Holden property line. (Applicant Site plans – all versions)

595. The Vermont Air Pollution Control Regulations state "*A person shall not discharge, cause, suffer, allow, or permit any emissions of objectionable odors beyond the property line of a premises.*" (Vermont Air Pollution Control Regulations § 5-241(b))

596. The Applicant has not provided any evidence that the diesel emissions from quarry equipment and the large number of trucks accessing the quarry site will not travel the 200 plus feet onto the Holden property or other neighboring properties. (Direct and Cross exam of Peter Guldberg December 16, 2008)

597. The Applicant's blast plans do not call for the use of blasting mats in normal quarry operations. Blast mats may be used in blasting for the Route 100B Site Line. (See R-84).

598. There is no provision in the blasting plan to control the dispersion of dust into the air. (See R-84).

B. Proposed Conclusions of Law Regarding Air Pollution

Neighbors' Question #1 of their Clarified Statement of Questions in Docket No. 68-3-07

Vtec asks: "Does the proposed quarry fail to comply with 10 V.S.A. § 6086(a)(1) (Air) due to undue air pollution caused by the various quarry activities including on-road and off-road diesel exhaust, crystalline silica, and other airborne contaminants such as dust?" Rivers bears both the initial burden of production and the ultimate burden of persuasion under Criterion 1. For the reasons below, we must conclude that Rivers has not met its burden of persuasion under Criterion 1.

Particulate matter pollution consists of very small liquid and solid particles floating in the air. Of greatest concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. These particles are less than 10 microns in diameter. The term "PM 10" means coarse particulate matter measuring less than 10 microns in diameter. The term "PM 2.5", which is a subset of PM 10, means fine particulate matter measuring less than 2.5 microns in diameter. Rivers air expert, Mr. Guldberg, estimated that of the PM 10 particles, 10% will be in the PM 2.5 subset. A range of 10-20% is typically used for estimating the amount of PM 2.5 as a percentage of PM 10. Conservative worst case modeling would require using the 20% factor. Mr. Guldberg could not provide a rationale for using the 10% factor for estimating PM 2.5 instead of the more conservative 20% factor.

Mr. Guldberg did not study the climatology of the valley where the proposed quarry would be operating. Mr. Guldberg was not aware of the frequency or duration of inversions or fog in the vicinity of the proposed quarry. Neighbor Ben Sanders provided credible testimony from personal experience about the frequent air inversions in the vicinity of the proposed quarry. Mr. Guldberg acknowledged that the data he obtained from the Underhill air monitoring station is not representative of the Mad River Valley topology or climatology.

The proposed haul road and staging area are approximately 225 feet from the Holden

property line. The Vermont Air Pollution Control Regulations state “*A person shall not discharge, cause, suffer, allow, or permit any emissions of objectionable odors beyond the property line of a premises.*” (Vermont Air Pollution Control Regulations § 5-241(b)). The proposed quarry will have multiple off-road diesel and dust sources including a drill, crusher, screener, excavator, loader, and a water truck with a significant number of days where some if not all equipment will be running for 10 hours. In addition, the quarry, if permitted will draw up to 54 heavy trucks per day up the access to road to the staging area. The Applicant has not provided any evidence that the diesel emissions from quarry equipment and the large number of trucks accessing the quarry site will not travel the 200 plus feet onto the Holden property or other neighboring properties.

Because Rivers failed to conservatively model the amount of PM 2.5 particulate matter, failed to model the climatology of the valley where the proposed quarry would be operating, and failed to provide any evidence that the diesel emissions from quarry equipment and the large number of trucks accessing the quarry site will not travel the 200 plus feet onto the Holden property or other neighboring properties, we must conclude that Rovers has failed to meet its burdens of production and persuasion under Criterion 1.

Neighbors’ Questions #6–7 of their Statement of Questions in Docket No. 7-1-05 Vtec ask, in general, whether the proposed quarry complies with the requirements of MZR § 3.5 governing the extraction of earth resources. Under MZR § 3.5(C), the proposed quarry cannot be permitted if it would cause a hazard to public health or safety, or have an undue adverse effect on neighboring properties and uses, § 3.5(C)(1), or aesthetic values, § 3.5(C)(4). Because of our conclusion above under Criterion 1 that Rivers failed to prove that its quarry would not cause undue, i.e., harmful, air pollution, we cannot conclude under MZR § 3.5(C) that the proposed

quarry will not cause a hazard to public health or safety. We further conclude under MZR §§ 3.5(C)(1) and 3.5(C)(4) that the foul-smelling diesel exhaust and fugitive particulate emissions from the proposed quarry would have an undue adverse effect on neighboring properties and uses and the aesthetic values of this rural residential community.

Neighbors' Question #12 of their Statement of Questions in Docket No. 7-1-05 Vtec asks: "Whether, under MZR Section 4.10(A), the land or structure(s) for the application and proposed quarry will be used or occupied in any manner so as to create dangerous, injurious or noxious conditions that adversely affect the reasonable use of adjoining or nearby properties?" We must conclude that the proposed quarry, with the diesel exhaust from up to 54 heavy trucks accessing it every day, would create a noxious condition that would adversely affect the neighboring residences and horse farms, in violation of MZR § 4.10(A).

Neighbors' Question #13 of their Statement of Questions in Docket No. 7-1-05 Vtec asks, in relevant part: "Whether, under MZR Section 4.10(B)(1)-(5), the application and proposed quarry meets the following standards: [...] (4) No smoke, dust, dirt or noxious gases which endanger or adversely affect the health, comfort, safety, or welfare of the public or neighboring property owners, or which causes damage to property, business, or vegetation shall be permitted."? As noted above, the proposed quarry and the customer trucks accessing it would generate substantial amounts of diesel exhaust, which is a carcinogen and smells bad. These noxious gases would adversely affect the comfort, if not the health, of neighboring property owners. Furthermore, the noxious fumes from the proposed quarry and the customer trucks accessing it would adversely affect the business of the McMullin horse farm (currently operated as Mad river Stables) and the Sainsbury horse farm, in violation of MZR § 4.10(B)(4).