POLLUTION CONTROL FOR QUARRY OPERATIONS

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When the term "pollution" is used in connection with a limestone quarry, most people focus their thoughts only on the dust coming from the quarry. I wish it were that simple, although air pollution is far from a simple problem for quarries.

Air pollution has to stand in line along with several other forms of so-called pollution that "ecologists" talk about today. We are faced with inter-plant pollution of the workers environment, water pollution, soil pollution, noise pollution, and visual pollution. Undoubtedly, there will be other types that equally concern us in the future.

Over the long haul, visual pollution may well prove to be the most deadly form of pollution insofar as material suppliers, such as quarries and asphalt plants, are concerned. Zoning commissions literally hold the power of life and death for our industries. In one eastern state recently a plant was shut down (zoned out of business) because it didn't fit into the long-range aesthetic plan for the community.

Air pollution is the most immediate and serious problem facing the crushed stone industry today. No question about it, producing crushed stone is a dusty business. But, let's put dust from a limestone quarry into proper perspective as it relates to the total air pollution problem. It has been estimated that the total air pollution in the United States amounts to 133 million tons per year. The transportation industry (cars, buses, etc.) contributes 85 million tons (the automobile accounts for 4/5 of this total); the electric power industry - 15 million tons; space heating - 8 million tons; and all other forms of manufacturing - 22 million tons or only 15 percent of the total 133 million tons per year. Obviously, dust from the crushed stone industry and the construction industry as a whole makes up a very, very small proportion of the 15 percent of pollution contributed by manufacturing.

Dust from a limestone quarry is not toxic. Health considerations are not a factor with the emissions from a quarry. Also, dust released from material handling operations is generally large in particle size and settles within a short distance of the point of generation, thereby making this essentially a local problem. While it isn't a health problem, we must admit that quarry dust can certainly be a nuisance. It does cause local inconvenience. It settles on cars, porches and clothes hung out to dry. Therefore, the stone producer has a responsibility to his community to make a reasonable effort to significantly minimize the dust that crosses his property line that would affect residents of the community.

Basically, the crushed stone industry is faced with two distinct dust problems: first, the problem generated by dust from the crushing, screening and processing used to manufacture the product; second, the problem created by re-entrainment of previously settled dust on haul roads and stockpile areas. These represent large open areas that do not lend themselves to effective control.

How do we go about trying to solve our problems? We start by improving our housekeeping around our plant and office. This will go a long way in reducing many of the pollution problems, visual, dust, or noise. We eliminate as many areas as possible where dust might be re-entrained into the air. Wash-down walks and roadways where possible, sow grass, pave other areas where practical, plant trees and shrubs for screening purposes and to filter out dust and sound.

Haul roads are going to have to be treated. This may involve using an application of calcium chloride, continuously watering-down the roads, applying oil to the roads or possibly paving them. None of the methods are cure-alls, and each has some problem connected with its use. Therefore, each producer will have to decide which is the best and most effective method, or combination of methods, to fit his operation.

Trucks that haul fine lime or sand are going to have to be covered or watered-down before they leave the quarry. Truckers are going to have to assume the responsibility for assisting the quarry in this area.

Stockpiles of sand and ag-lime, where they are located near the property line, close to housing areas, are problems. In periods of dry, windy weather, fine lime can be blown a surprising distance and there's really no practical, effective way to control this problem. These stockpiles, if space is available, can be moved to out-of-the-way areas remote from the property line. It would be most difficult to spray stockpiles to keep them continuously wet, and, if we did, farmers wouldn't buy wet lime. There's really no economic solution.

Control of dust around the crushing and screening operations may consist of housing certain areas, such as the screening units and conveyors, use of wet-spray systems, and use of one or more of the various types of dust-collecting units. The type of system selected for each quarry will depend upon the characteristics of the particular operation, the characteristics of the stone being quarried, location of the quarry, land use around the quarry, and other factors.

The simplest means of controlling dust is through the use of fine water sprays, with wetting agents, at critical points in the operation. This may be a home-made or a commercially manufactured system. Those available commercially are not inexpensive, costing between $10,000 and $15,000. They are effective in controlling dust, but create other problems, such as increased equipment wear and, by causing fines to cling to the larger stone, make it very difficult to screen the stone to make certain gradation sizes. This is a serious problem.

As for dust collectors, there is a wide range of dust-collection equipment available, all of which is very expensive, such as:

(1) Wet collectors - similar to those used in asphalt plants;

(2) Dry cyclone collectors - also used by asphalt plants; and

(3) Fabric or bag-type collectors - in simplest terms, a large, sophisticated vacuum cleaner.

To give you some indication of the money involved in this type of equipment, the cost of installing a total dust-control system of bag-type collectors for a large quarry could cost as much as $200,000.

Obviously, we want a system that will control the dust to a reasonable level and meet the regulations of the Kentucky Air Pollution Control Commission, for the lowest possible cost. There is no one best system for all quarries. It could include one of the systems mentioned, a combination of them, or none of them.

There's no simple solution, each individual quarry is going to have to develop its own system, unique to its particular operation. There are going to be many problems associated with our control efforts: It may necessitate, from an industry standpoint, change in gradation specifications for aggregates. It may create worse water pollution problems than the air pollution problems we solve; it is going to require the development of new markets for the fine products collected by the dust collector; and, finally, it is going to be expensive. This has to bring about an increase in the price of aggregates, just as the installation of pollution control devices increases the price of automobiles, and the installation of pollution control equipment at power plants is going to increase our electrical rates. Don't misunderstand, I'm not using increased cost to the consumer as an argument against pollution control, but, it is going to increase the cost, and don't ever forget that the individual citizen is going to pay for cleaning up the environment.