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A case study in cooperation: A gravel pit and its community

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It is often the case in the permitting and operation of gravel extraction and crushed stone quarries that aggregate companies and the local community are pitted against one another. This paper presents a case study of an existing gravel pit that came together with the community to work through concerns about the existing operations and a proposed expansion. The topics of discussion include: the interesting dynamics involved in the consulting process, resulting mitigation to meet local standards and community concerns, conflicts of interests, and the local permitting process. The cooperative process used is presented in contrast to traditional permitting systems using case studies of projects that have undergone permitting using more adversarial process models.

1 INTRODUCTION

The permitting process for commercial projects in the State of Vermont is very robust. While performance standards are less defined and sometimes ambiguous, especially at the local level, the process of evaluation by governing bodies, review boards, and the general public is well established. Conducting the minimum which is required by law and permitting boards though, often leads to significant opposition, and a very costly and lengthy project timetable.

Vermont tends to be unique compared to many other states, in that it has very strong public involvement throughout the permitting process. From a developer's perspective, such public involvement in the process can have a negative impact in controversial projects when the developer and public are at odds. This usually results in a significantly long and adversarial hearing process. On the other hand, when developers choose to work with other parties to the proceeding, their projects can be improved and the process expedited.

J.P. Carrara & Sons (JPC) is an aggregate company located in Vermont and New York. They have operated a gravel pit in the village of East Middlebury, Vermont for many years and recently proposed an expansion of the gravel pit to the local Design Review Board. A map of the site is shown in Figure 1. In 2007, members of the East Middlebury community reached out to JPC and proposed that they try a different approach to permitting and impact analysis. Interested community members proposed that JPC and the community work together with hiring their experts. Since the experts' analyses were used for permitting, all expenses were paid by JPC.

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Interested community members however, were a part of interviewing experts for hire, and providing input and feedback on the various impact studies that were completed for the gravel pit. Together, interested community members and JPC worked with acoustics, hydrogeology, ecological, air quality, and traffic experts to prepare impact assessments that could be used for both local and state permitting. This paper discusses the process used by the group for the noise impact assessment and the results of the assessment.

2 THE CONSULTING PROCESS

Interested community members were directly involved in five parts of the consulting process: consultant interviews, pre-study group meeting, site visit, assessment review meeting, and public hearings. The only parts of the assessment that the community members were not involved in was the consultant's job of modeling, analysis, mitigation development, and reporting.

2.1 Consultant Interviews

To enable good communications and efficient planning, one person from the group of interested community members worked directly with JPC during several parts of the process. One responsibility of this group liaison was to interview all consultants and experts together prior to JPC retaining their services. It was important for the group liaison to be involved in the interviews in order for the community group to have confidence that the consultants would be working for the joint interests of JPC and the community.

2.2 Pre-study Group Meeting

All members of the community group were invited to a pre-study group meeting held at the local library. The purpose of the meeting was to gather community concerns about the project, develop a work plan, and to provide the community group and JPC with a general knowledge base on acoustics. For community members who were unable to attend the meeting, the consultant provided a direct line of communication via phone or email for their input. Some members of the group provided confidential input.

The pre-study meeting and the one-on-one communication between the consultant and the community group members resulted in a list of statements describing the group's concerns and their experiences with the existing operation. Some of the issues that were brought up were:

- The audibility of backup alarms in the community
- Noise from trucks driving through the village and specifically the noise from acceleration and deceleration up and down the hill to the gravel pit
- The effect of foliage on sound propagation
- Banging noise from the bucket loader and truck tailgates
- The frequency of truck trips through town with regards to noise
- How quickly trucks accelerate or decelerate at intersections in town
- How the widening of a road for the project would affect sound propagation towards a local playground area

- Perceived vibration in a house from trucks driving passing by
- Noise from "loud grinding earth moving equipment"

One interesting concern that was raised at the pre-study group meeting was the possibility of the pit being sold to another company which may be less community-minded in their management. Needless to say, this information is invaluable to a consultant or a developer, especially prior to conducting a noise impact assessment. It is significantly useful in developing successful and acceptable mitigation strategies.

2.3 Site Visit

The group liaison took part in the site visit with the noise consultant. Background sound monitors were set up at five locations around the village. One monitor was placed in the existing gravel pit and four other monitors were placed at group members' homes which conveniently represented different noise environments throughout the community. The group liaison assisted with getting permission to place monitors at the homes. This was clearly an advantage of working with the community as getting permission to monitor at residences that are good representative locations is often very difficult in noise impact assessments. The group liaison also accompanied the consultant and JPC staff into the existing gravel pit and other locations to monitor sound levels of trucks, loaders, and dozers used in existing operation.

2.4 Noise Standard

The Town of Middlebury has a noise ordinance, but it is not a quantitative standard. The ordinance states:

> "No person or persons shall make or continue, or cause to be made or continued, any excessive, unnecessary, or unreasonably loud noise or disturbance which disturbs, destroys, or endangers the comfort, quiet, repose, health, peace or safety of others within the immediate vicinity of the noise or disturbance."

The State of Vermont does not have a quantitative noise standard, either, but the Environmental Board, the state's former appeal board for regional environmental permits, has set precedents for similar projects with a limit of 55 dB $LAeq_{(1\text{-}sec)}$ at homes and areas of frequent human use. In some cases where the town plan has clear language limiting noise from quarries, the Environmental Board has used a 50 dB $LAeq_{(1\text{-}sec)}$ limit at homes and areas of frequent human use. In addition to the limit at homes, in selected cases the Board has applied a 70 dBA limit at the property line.

For the JPC gravel pit, the project was evaluated against a limit of 55 dB $LAeq_{(1\text{-}sec)}$ at neighboring homes and areas of frequent human use. Above and beyond this standard, additional consideration was taken when developing mitigation strategies to address specific concerns that were stated during the pre-study community group meeting and communications.

2.5 Modeling and Analysis

The first phase of the assessment involved analyzing the monitored data from the gravel pit and the surrounding residences to determine if sound events within the existing pit were causing sound levels in excess of 55 dBA. It was found that none of the events of 55 dBA or greater at residences were due to gravel pit sources. This was confirmed with audio recordings taken at most of the monitors. Higher levels monitored within the village were typically due to traffic or dogs barking.

To assess whether or not sound levels from the gravel pit would be 55 dBA or less at each home and areas of frequent human use, the maximum sound pressure level at each receiver was modeled in accordance with ISO 9613-2 assuming that all regular operational sources were operating at their maximum sound pressure levels simultaneously. This was completed for an initial phase and final phase of the proposed extraction areas. Noise during reclamation was not evaluated since it is considered a temporary construction activity. The highest modeled level at nearby residences was 50 dBA. This was achieved by recommending a realignment of the access road and ensuring that the site remains as vegetated as possible.

In addition to the recommendations needed to meet state precedent standards, seven other recommendations were made to address concerns of neighboring residences, which were not taken into account in the propagation modeling. Some of the recommendations included:

- Paving a portion of the access road to prevent unnecessary noise from trucks driving over grooves and holes in the road
- Laying out truck routes in such a manner to limit the use of backup alarms during loading
- Implement a good-neighbor driving program which includes training to not use engine brakes unless necessary for safety reasons, to accelerate and decelerate at all intersections slowly, and reporting any unordinary noises from their vehicles to management (i.e. squeaky brakes)
- Using only trucks with equal or lesser sound power levels than their existing Freightliners
- Switching from standard pure-tone backup alarms to broadband, variable loudness, or radar-type alarms to the extent permissible by the Mine Safety and Health Administration
- Providing to any neighbor that requests it, the name and phone number of the site supervisor to report any complaints

2.6 Assessment Review Meeting

After modeling, analysis, and mitigation development were complete, the community group was invited to meet again at the local library to review the draft report. The purpose of this meeting was to discuss the proposed mitigation and how the community concerns were being addressed, to gather feedback on the draft report, and to determine if additional analysis or mitigation needed to be considered. The draft report was received well at the assessment review meeting. At the meeting there was additional discussion about truck noise through the village, but modifications to the analysis, mitigation, or report were not necessary.

2.7 A Note on Conflicts of Interest

There was considerable consideration at the start of this project regarding the issue of conflicting interest. It was decided and deemed acceptable by the community group, that while the consultant's work was funded by the developer, JPC, the consultant was bound to a code of ethics through INCE which involved objective evaluation of the project impacts in accordance with applicable standards. While addressing community concerns is not a part of the applicable standards, JPC had the ability to reject any mitigation recommendations that were above and beyond those necessary to meeting the applicable standards. Based on the agreed upon work plan, the consultant would still publish all of their mitigation recommendations in their final noise impact assessment whether they were accepted by JPC or not.

3 CONCLUSION

This was a special case where members of the community were interested in working with the developer to avoid as one member put it, a "battle of the experts." And while for this project the community group approached the developer about this special type of process, this should serve as a lesson for other developers about the opportunity to develop a genuine relationship with the community in which it intends to operate and the influence that can have on the permitting process. To avoid being naïve, there will usually be some members of the community who have NIMBY (Not-In-My-Backyard) stance, but by at least working with the community members who are willing to provide constructive criticism, developers can do their best to provide a responsible design while building support and minimizing future issues with their project.

The JPC application was well-received by the local design review board. Many members of the community spoke highly of the company and in favor of the project at the public hearing.

5 ACKNOWLEDGEMENTS

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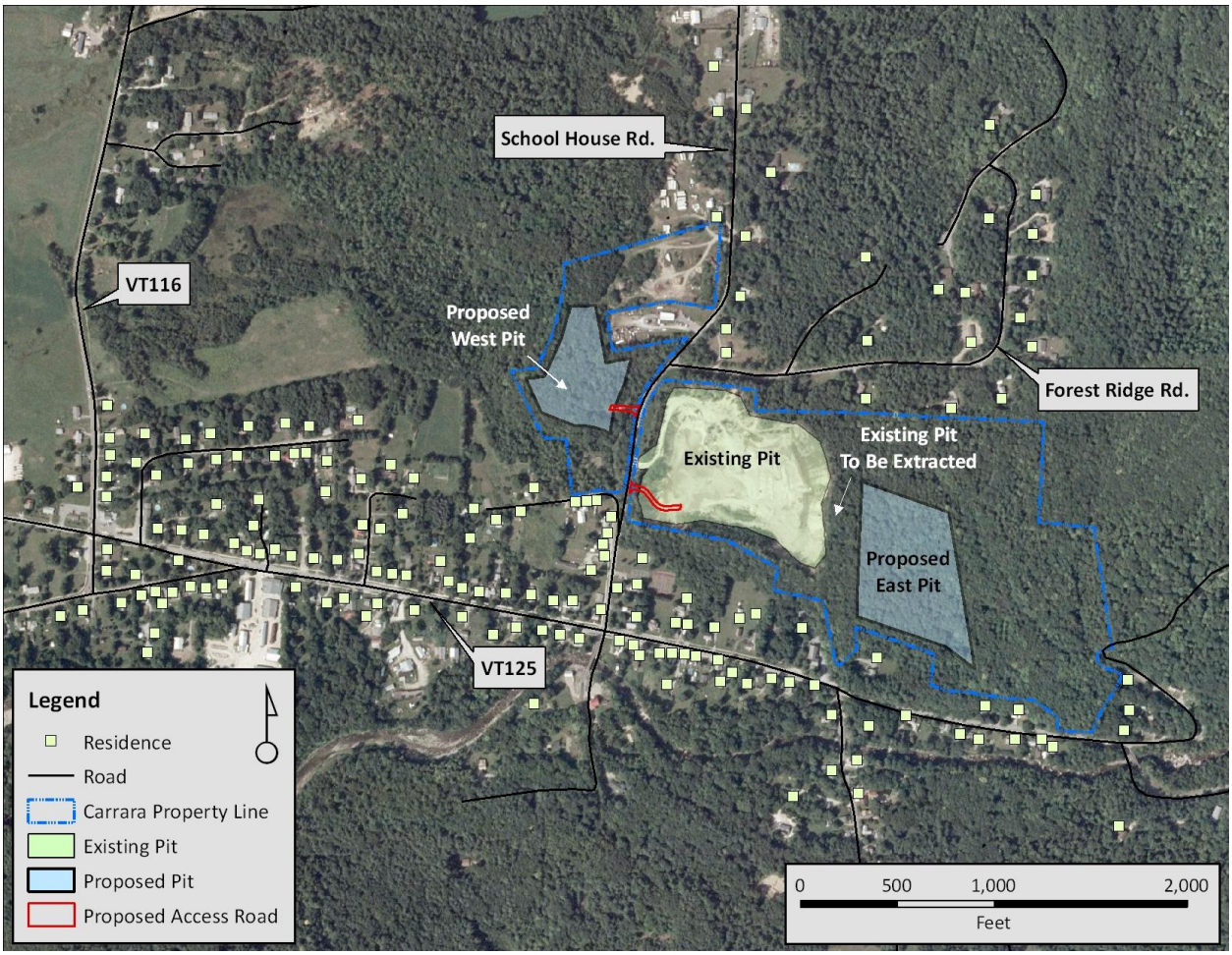

Fig. 1 - JPC project site in East Middlebury, Vermont. The west pit was initially considered as part of the expansion, but was not pursued.