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VIA FAX: 514.849.0785 (9 pages)

Subject: Molson Stadium Noise Impact

Dear Michael,

In an effort to gauge the potential for increased noise impact from the expansion of the Molson Stadium located at McGill University in Montreal, we have studied the images provided by your office of the existing structure and its surroundings, along with the architectural concept drawings illustrating the proposed additions.

### **Scope of Renovation**

The stadium is located in what must be considered an urban area on the campus of McGill University. The renovation plan (shown on the attached figures) adds suites along the top of the existing north sideline structure. The south side line is extended by approximately 22 rows, above and beyond the existing seating riser structure. In addition, seating is added to the north east corner of the stadium with field level seating in the east end zone. The west end zone remains as is.

The current sound system configuration (composed of pole mounted speakers on the south side line and ground mounted speakers on the north sideline and end zones) is not expected to change. Minor adjustments are likely to accommodate the new seating sections.

### **Noise Considerations**

During events (typically football games) there are two primary sources of noise which may impact the community. These include crowd noise (ie; cheering, applause) and the stadium sound or public address (PA) system. Of these two, the PA system typically is the source of the greatest community impact. This is due to the fact that the sound system is used more regularly than robust crowd response, and the power level of the few sound system loudspeakers is much higher (louder) in comparison to the voices of individual fans. This difference means that, at a distance outside the stadium, PA sound levels are typically higher than those measured for crowd noise.

Another consideration is that announcements are typically made after every play, and music is often a feature of professional sports events, while the crowd noise is less frequent, tends to be short in duration, and does not contain an easily identifiable rhythmic or melodic character. In our experience with dozens of outdoor sports and entertainment facilities, it is rare to receive a neighborhood complaint solely in regards to crowd noise.

### **Anticipated Changes in Noise Impact**

Clearly, the potential exists for increased crowd noise levels, due to an increase in capacity. The additional seating represents about a 25% increase in capacity. In acoustical terms, a 100% increase in fans, assuming that all are cheering at the same time, would result in a 3 dB increase in crowd sound levels (in reality, crowd noise is highly variable). This means that the increase in crowd noise will be approximately 1 dB, which is below the level that most observers would

considered to be a significant change in community sound levels. We do not expect any adverse community impact from the increased sound levels.

Were the stadium sound system to be changed to produce much higher loudspeaker sound levels or if it were to be modified extensively, then community noise levels from the sound system could increase.

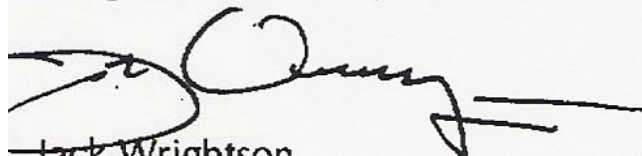
In this case, however with no changes in general geometry or speaker configuration the sound system, or changes in the sound system acoustical performance, such as loudness capability or low frequency output, it is expected that the increase in the barrier provided by the stadium north side additions (3 m total) and south side line additions (15 m total increase in height) can be expected to lower neighborhood sound levels to the north and south of the stadium in comparison with its current architectural configuration. This is particularly true of the south side line, as its height is nearly doubled by the new construction.

### **Mitigation Measures**

The most important mitigation measure concerns the sound system and is operational in nature. Care should be taken to ensure that sound levels from the existing sound system are not substantially increased as part of the game production effort in the renovated stadium. In the event that the system is substantially modified in response to consumer demand or to better service the new seating sections, community measurements should be made before and after any modifications to ensure that the orientation of the loudspeakers and their electronic set-up (ie; equalization, limiting) do not result in significant changes in neighborhood sound levels.

I trust that this review is of use in your planning, development and design process. Please don't hesitate to call should you have any questions or need additional information.

Best Regards,  
Wrightson, Johnson, Haddon & Williams, Inc.



Jack Wrightson  
Principal