

PROJECT PROFILE: **LABORATORY EXHAUST FANS**



PROJECT: MSU CHEMISTRY BUILDING
Bozeman, Montana

Since the Chemistry Building opened, the laboratory exhaust fans generated a steady stream of noise-related complaints, both on and off campus, and even from MSU's President! The many openings of the entrainment-type fans presented a unique challenge for noise analysis and control.

MSU selected Big Sky Acoustics to quantify the existing noise levels of the fans, design noise control measures and evaluate the effectiveness of each option.

BSA's SERVICES AND SOLUTIONS:

- Measured daytime and nighttime ambient noise levels at 16 locations around campus. The Chemistry Building fans dominated the noise levels at 11 locations.
- Developed a computer model to separate the individual noise sources associated with each fan, including the side motor access openings, the barrier openings, the top of the stack, and the bypass air opening. Verified the model's accuracy by comparing the measured and predicted noise levels.
- Ranked the contribution of each individual noise source to evaluate the effectiveness of various noise mitigation measures, such as installing attenuators in the discharge stacks, blocking the motor access openings, and adding sound-absorbing material inside the barrier.
- Recommended the appropriate combination of noise mitigation measures to make the fan noise half as loud as the existing conditions.



With the unbiased analysis and proper design information provided by Big Sky Acoustics, MSU made informed decisions to significantly reduce the fan noise within budget and meet the college's expectations.