

Owner / Applicant Information

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Submitter Information

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Designer Information

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Project Information

Phosphorus Removal Improvements
2455 Millersburg Road

Boonville IL 47601

County WARRICK

Project Type New Addition Alteration Existing Change of Occupancy

Project Status U F=Filed U or Null=Unfiled

IDHS Issued Correction order? No Has Violation been Issued? No

Violation Issued by: NA

Local Building Official

Phone: Email:

Local Fire Official

Phone: Email:

Variance Details

Code Name: Other Code (Not in the list provided)

NFPA 820 Table 5.2.2, Row 9c

Conditions: Our firm is working with the City of Boonville to make upgrades at their wastewater treatment plant. The plant has an aerobic treatment system, which is not preceded by primary sedimentation. Air is delivered to the treatment system via rotary disk aerators, which agitate and entrain air into the liquid. The aerator motor is centered approximately 19.5' above the top of the tank wall, but the bottom of the motor is only 14" above the top of the tank making it, and the conduit that feeds it, within the 18" envelope described by the code. The original design, installed in 2001, included unclassified motors, conduit, and conduit fittings that turn the shafts with the aerators. With the upgrades we are adding variable frequency drives (VFDs) to the motors to allow better aeration control.

Per a strict interpretation of NFPA 820 (Table 5.2.2, Row 9c), this location requires Class 1 Division 2 motors, conduit, and conduit fittings since there is no upstream primary sedimentation and a portion of the motor is within the 18" requirement.

DEMONSTRATION THAT PUBLIC HEALTH, SAFETY, AND WELFARE ARE PROTECTED:

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1=Non-compliance with the rule will not be adverse to the public health, safety or welfare

2= Applicant will undertake alternative actions in lieu of compliance with the rule to ensure that granting of the variance will not be adverse to public health, safety, or welfare. Explain why alternative actions would be adequate (be specific).

Facts: The theoretical explosion risk is a buildup of methane gas from the breakdown of organic waste by anaerobic bacteria. On behalf of the City of Boonville, we would like to request a waiver of the requirements of NFPA 820 for these particular motors for the following reasons:

1. The existing unclassified motors have operated without incident for almost 20 years
2. A portion of the motors are outside of the 18" requirement
3. Aerobic treatment within these tanks precludes the formation of anaerobic methane-generating bacteria
4. Evoqua, the manufacturer of the treatment system, says that they know of no locations where this equipment is installed with classified motors
5. The layout of the tank is elevated which allows for significant amount of air flow across the tanks and makes buildup of any methane, should it be present at all, unlikely
6. The cost for upgrading to electrically classified motors, conduit, and conduit fittings is \$ 40,815, which is significant for the City.

Given the very low risk of explosion hazard at this location, the successful operation of unclassified motors, and the cost of converting to six Class 1 Division 2 motors at this location we hope that you can grant this community a variance to NFPA 820 Table 5.2.2, Row 9c and allow unclassified TEFC motors for the six motors in question.

DEMONSTRATION OF UNDUE HARDSHIP OR HISTORICALLY SIGNIFICANT STRUCTURE:

Imposition of the rule would result in an undue hardship (unusual difficulty) because of physical limitations of the construction site or its utility services.

Imposition of the rule would result in an undue hardship (unusual difficulty) because of major operational problems in the use of the building or structure.

Y Imposition of the rule would result in an undue hardship (unusual difficulty) because of excessive costs of additional or altered construction elements.

Imposition of the rule would prevent the preservation of an architecturally or a historically significant part of the building or structure.

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