**From:** Dodds, Jennifer <dodds.jennifer@epa.gov>
**Sent:** Wednesday, April 29, 2020 12:56 PM
**To:** Jeffrey Howard Danko
**Cc:** Carey, Angela J - DNR; Clarizio, Richard; Moore, Tammy; Sundar, Bhooma
**Subject:** EPA Review of Tyco 2-14-20 VI Work Plan Responses
**Attachments:** EPA 4-29-2020 Comment Letter - Tyco VI Workplan.pdf; NonResidential Indoor Air Eval Form.docx

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

Mr. Danko,

Please find attached an electronic copy of the EPA and WDNR review of Tyco's February 14, 2020 responses related to the Vapor Intrusion Assessment and Work Plan (VI Work Plan) for the Tyco Fire Products LP, Stanton Street Facility, located in Marinette, Wisconsin. Also attached is a non-residential building indoor air evaluation form which is further explained in the attached letter. Should you have any questions regarding this matter, please let me know.

Thank you,

Jennifer Dodds
U.S. Environmental Protection Agency, Region 5
Land, Chemicals and Redevelopment Division
77 West Jackson Blvd, LR-16J
Chicago, IL 60604-3590
Tel: (312) 886-1484
dodds.jennifer@epa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
LR-16J

April 29, 2020

**VIA ELECTRONIC MAIL**

Mr. Jeffrey Danko
EHS Manager – Environmental Remediation
Johnson Controls
5757 N. Green Bay Avenue
Milwaukee, Wisconsin 53209

RE: Review of the February 14, 2020 Tyco Fire Products LP response to the December 19, 2019 Agency comments on Vapor Intrusion Assessment and Work Plan
Tyco Fire Products LP, Stanton Street Facility, Marinette, Wisconsin
EPA ID: WID 006 125 215
EPA RCRA Administrative Order Docket No. RCRA-05-2009-0007

Dear Mr. Danko:

The United States Environmental Protection Agency (EPA) and the Wisconsin Department of Natural Resources (WDNR) have reviewed the Tyco Fire Products LP (Tyco) February 14, 2020 response to agency comments on the Vapor Intrusion Assessment and Work Plan (VI Work Plan) originally dated September 27, 2019 for the Tyco Fire Products LP, Stanton Street Facility, located in Marinette, Wisconsin. Comments are provided in this letter.

If you have any questions regarding these comments, please do not hesitate to contact me at 312-886-1484 or dodds.jennifer@epa.gov.

Sincerely,

Recoverable Signature

X Jennifer Dodds

Jennifer Dodds
EPA Project Manager
Signed by: dodds.jennifer@epa.gov

ecc: Tammy Moore, EPA
Rich Clarizio, EPA
Angela Carey, WDNR

**EPA and WDNR comments on 02/14/2020 Response to Agency Comments on VI Assessment and Work Plan originally submitted 09/27/2019**

**General Comments:**

1. Tyco has proposed a quantitative decision framework (QDF) approach to address the expanded assessment required to meet the regulatory requirements clarified in the agencies' 12/19/2019 response, and has indicated that the proposed QDF addresses comments 1, 3-6, 9-14, and 18. Comments 2, 7, 8, 15, 16, 17 and 19 were addressed separately.

**Comments 1, 3-6, 9-14, 18: Quantitative Decision Framework Approach:**

2. To perform a comprehensive assessment of vapor risk that prioritizes buildings with higher occupancy and less air exchange, a modification of a QDF process developed for naval facilities with industrial/commercial buildings is proposed. Vapor risk would be assessed based on building characteristics, occupancy, and subsurface information. An example decision framework is provided as an attachment however, it is difficult to assess the QDF process without a site-specific scoring and decision framework. Please note that the use of such a strategy cannot supplant state rules and guidance. A workplan should be submitted which presents the framework showing the specific elements and scoring that will be used at the Tyco facility. The framework should include the following elements for each building:

    a. Demographics: consider vulnerable populations.
    b. Duration of occupancy of buildings: Are buildings occupied continuously or intermittently?
    c. HVAC system: Is the building heated/cooled, negatively or positively pressured, and are there substantial exhaust fans that could create negative pressure zones?
    d. Building envelope: What is the slab thickness and condition, ceiling height, number of sumps, utility penetrations, etc.?
    e. History of contaminant use: historical use to provide info on likelihood of release, current use to inform viability of indoor air samples.
    f. Depth of building foundation compared to water table elevations.
    g. Range of water table elevation variability.
    h. Soil data: Given that available data is from investigations performed in 2000, how will soil contamination be addressed in the QDF?
    i. Condition of sewer lines: provide detailed information. For example, if the sewer lines into a building have been relined, discuss how it impacts the decision to sample the conduit in addition to indoor air.
    j. Discrete samples and analytical results must be used for groundwater and sub-slab concentrations, not averages as indicated in the QDF.
    k. Soil vapor samples: The score card for QDF includes soil gas data. The vadose zone may not be present in locations where building foundation may be in contact with water table. In those cases, how would the prioritization efforts and score card be adjusted?
    l. Due to the proximity of water table to building foundations, vertical distance separation criteria may not apply for petroleum VOCs. The QDF evaluation pathway should be identical for both cVOCs and petroleum VOCs in groundwater and soil source area.

**Indoor Air and Sub Slab Vapor Sampling:**

3. In the response to comment #1, on page 2, it states that higher scoring buildings would be assessed by first collecting indoor air samples. The strategy to quickly collect indoor air samples at buildings with higher occupancy and less air exchange allows assessment of current vapor intrusion however, indoor air sampling is not a substitute for sub-slab sampling when soil, soil gas and groundwater indicate a potential risk. All conditions that lead to vapor intrusion should be assessed and multiple lines of evidence should be used to prioritize assessment activities.

4. *Building 14:* Initially two sub slab vapor sampling locations were proposed for Building 14 however, in the response to comment 16, sub slab vapor sampling is only proposed if indoor air results indicate that vapor intrusion is occurring. Wis. Admin. Code NR716.11(5)(g) requires sub slab soil gas sampling when data indicate that vapors may migrate to the foundation of occupied buildings. The language of Figure 3a of RR800 that discusses using site specific factors in determining whether sub slab sampling would be necessary reflects the latter part of NR716.11(5)(g) which states "taking into account the biodegradability of vapors, preferential pathways of vapor movement, or other physical or chemical factors affecting vapor movement into buildings." For example, if it can be shown that the only pathway for vapor intrusion into a building is likely via a preferential pathway, then taking sub slab samples may not make sense. However, given the high concentrations of chlorinated solvents in groundwater adjacent to Building 14 (including TCE of 100 micrograms per liter), the shallow depth to groundwater, and that little attenuation of chlorinated solvents in the vadose zone is expected, the sub slab concentrations must be established. This is important to determine whether vapor concentrations pose a threat to occupants of the building now and in the future.

   As discussed in Section 7 of RR800, response actions for vapor intrusion are required primarily based on sub slab vapor concentrations. Also, when subsurface vapors are at or over vapor risk screening levels, Wis., Admin. Code Sections NR 722.09 and 726.05 require remedial actions to reduce the mass and concentration of the vapor source to the extent practicable. Therefore, it is important to establish sub slab vapor concentrations at this building by sampling vapor pins through the foundation.

5. *Other Buildings:* Similarly, if subsurface data indicates the likelihood that vapors may migrate to the foundation of occupied buildings, then sub slab sampling may be necessary. This decision can be made on a building by building basis however, this decision cannot be based primarily on indoor air sample results.

6. *Comment 16: Building 14:* Please provide a sketch which shows where the office and support areas occur within the larger building.

7. The non-residential building evaluation form that is included as an email attachment along with this letter, is to be completed and submitted along with Winter 2020 indoor air sampling analytical data.

# Instructions: Non-Residential Indoor Air Evaluation Form

## Introduction

This form was developed to aid in the evaluation of volatile organic compound (VOC) vapor intrusion into non-residential buildings. Portions of this form may also be applicable to radon intrusion. It is assumed that the user of this form has a basic knowledge of environmental sampling, building ventilation, and building construction. For building evaluations, it is important that the building maintenance staff be present. For more complicated buildings, the HVAC specialist or contractor may need to be present.

It is recommended that two staff be present to conduct evaluations. The staff should have appropriate health and safety training for the hazards that may be present in non-residential buildings. During the building evaluation, there are certain activities that should only be performed if the staff has the appropriate training and clearance. For example; viewing ventilation and other equipment on roofs, or entering building structures dedicated to mechanical equipment and HVAC systems that may require specific confined space and lockout tagout procedures and training for ladder safety. The staff activities should follow the guidelines from their health and safety specialist and those from the facility being evaluated.

## How to use this form

The form has been broken into four parts that should be completed to the best extent possible. Supplemental information, such as HVAC test and balance, commissioning, and sequence of operations, may also need to be provided by the building operator. For large buildings or campuses, it is recommended that a kick off meeting be conducted and documented. This meeting should be used to discuss the purpose of the evaluation, gather information and documentation, and to gain insight into building operations.

Evaluation of ventilation for large warehouse spaces and hangers is not covered here. In addition, if there are structures built inside these spaces, they should be evaluated as individual buildings using this form.

It is recommended that the staff evaluating the building be familiar with this form contents and document information when it is observed or is raised during conversation.

## Part 1

The intention of Part 1 is to document contact, building size, and building construction and occupant information.

## Part 2

Part 2 includes initial observations of conditions that could impact vapor intrusion and evaluations of potential indoor air sources. General ventilation observations, a pathway evaluation, and pressure and temperature evaluations should be documented in this part. Sampling should be focused in areas where there are pathways, driving forces, or stagnant conditions. Areas where there is greater outdoor air exchange and/or potential VOC sources should be a lower priority for sampling.

Where pathways are identified, they should be used to help target locations to collect indoor air samples. It is also recommended that VOC samples be collected in the identified pathways to help understand vapor intrusion potential.

**Part 3**

List items/products in the building or the adjacent structures that may contain site specific compounds of concern. These should be removed prior to sampling. List items/products/operations that give off significant volatiles as these may interfere with chemical analysis. The use of a portable instrument, such as a photo-ionization detector (PID), can help locate volatile chemicals.

Most businesses should have Safety Data Sheets (SDSs), these should be evaluated. A physical inventory should also be conducted, there may be products present that are not represented by SDSs.

Examples of products that may contain trichloroethene (TCE) are gun cleaner, rubber cement, solvent degreasers, spot removers, correction fluid, and electrical motor cleaner. Be aware that older products are more likely to contain TCE.

**Part 4**

Part 4 is a voluntary evaluation of building ventilation systems. Because most non-residential buildings are intended to be actively ventilated, the form focuses on active ventilation systems. Where there are non-residential buildings that are designed and constructed like residential buildings (or are converted residential buildings) the residential evaluation form should be used for ventilation evaluations.

If there is a building management system, it is critical to review the system operations, set points, and the sequence of operations for each ventilation zone. Information from the management system should also be verified during the walkthrough of the building.

For more information on this form please contact EPA’s Project Manager.

# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

## PART 1: General Information

**Business Name:** _____

**Address:** _____

**Contact Name:** _____

**Phone:** _____ **Email:** _____

**Facility Owner/Landlord Information** (If different from above)

**Name:** _____

**Phone:** _____ **Email:** _____

**Other Building Contacts** _____

**Building/Business Type and Uses** (Check appropriate boxes)

☐ Office Space ☐ Warehouse ☐ Manufacturing ☐ Multi-story ☐ Multi-tenant ☐ Warehouse

☐ Single level Office/Warehouse ☐ Other _____

**Building Occupancy**

Number of Occupants: _____ Adults: Gender M/F _____/_____ General Age ranges:_____

Days/Hours of occupancy _____ Duration of work shifts _____

Days/Hours of ventilation system operation _____

**Building Characteristics**

Year/Decade Built: _____ Number of Stories: _____

Approximate Building Area (square feet): Total _____ First Floor _____

Is there an attached warehouse/shop space? (Y/N) ____ describe its use: _____

Is there a basement or underground garage? (Y/N) ____ describe its use: _____

**Foundation Type** (Check appropriate boxes)

☐ Slab-on-Grade ☐ Slab-above-Grade (elevated/cap-slab on fill) ☐ Crawl Space ☐ Basement ☐ None

Describe _____

**Survey Preparation Information**

Preparer's Name: _____ Date Prepared: _____

Affiliation: _____ Phone: _____ Email: _____

# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

## PART 2: Factors Impacting Indoor Air Quality and Sampling

**Questions**

Describe renovation activities over the last 6 months (what was done, what area, and when):

_____

_____

_____

Describe any open combustion in the building. (smoking/incense/candles/cooking/burning)

_____

_____

_____

Have site-specific contaminants of concern been used or stored in the building or nearby? ☐ Yes ☐ No

Please list the general types of chemicals_____

Have any significant amounts of volatile chemicals been used recently? ☐ Yes ☐ No

Please list the chemicals_____

Describe any instance of water/groundwater present in the basement/crawlspace (including sumps):

_____

Are there conduits for sewer gases to enter the building (dry p-traps, open clean-outs, abandoned hook-ups, poorly installed/sealed/seated plumbing)? Describe:

_____

**Observations**

What is the temperature relative to outside? _____

**VI is promoted when the interior is warmer than the exterior.**

Were windows/doors/roll-up doors kept open? _____

**Increased ventilation from the outside will dilute vapors from the subsurface and may mitigate areas of negative pressure.**

Mechanical ventilation system status and condition? _____

Are intake or exhaust fans being used? _____

Are there ventilation hoods in use? _____

**Indicated by air moving from the outside in. Negative pressure is the main driving force that moves vapors into a building.**

Is there evidence of negative pressure? _____

Do parts of the indoor environment appear stagnant? _____

**Vapors may build up in areas with poor ventilation.**

Describe any strong odors. _____

**Strong odors may indicate poor ventilation or an indoor air source that may interfere with analysis.**

**Building Construction**

Building Construction Materials?

☐ Concrete ☐ Concrete Block ☐ Steel ☐ Wood ☐ Other _____

Does the building have an at-grade or below-grade garage? _____ How is it ventilated? _____

# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

Does the building have an attached mechanical room? _____

Does the building have footers distinct from the slab or integrated footers? _____

Is the building slab constructed with post-tension concrete? _____

What are the ceiling heights? _____

**Pathway Analysis**

Does the building have a basement or sub-surface structures that are/have:

☐ Unfinished ☐ Exposed soil ☐ Damp or flooded ☐ Unsealed utility lines ☐ Other _____

Are there utilities that penetrate the slab that may be conduits for soil vapor? ☐ Yes ☐ No

Are these:

Connected to subsurface vaults? ☐ Yes ☐ No

Connected to utilities closer to potential VI sources? ☐ Yes ☐ No

In areas where pressure differential would cause air to flow through them? ☐ Yes ☐ No

Is there non-ventilated spaces in the building (maintenance /electrical / server rooms)? ☐ Yes ☐ No

If Yes, describe: _____

Are these spaces occupied? ☐ Yes ☐ No

At what frequency/duration? _____

Are there potential pathways in these spaces? ☐ Yes ☐ No

If Yes, describe: _____

Are there heat sources in these spaces (servers, transformers, etc.? ☐ Yes ☐ No

If Yes, describe: _____

Are there heat sources or other systems that may generate a negative pressure near the floor/slab?

☐ Yes ☐ No

If Yes, Describe: _____

Are there elevators in the building? ☐ Yes ☐ No

If the elevators are hydraulic how deep do the pistons penetrate below the slab? _____

Are there utilities penetrating the floor/slab? ☐ Yes ☐ No

Are there sumps, either interior or outside and adjacent? ☐ Yes ☐ No

What is the condition of the foundation/slab? _____

# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

Was the building constructed with a subslab system or barrier? ☐ Yes ☐ No

If Yes, describe: _____

_____

_____

Are there floor drains? ☐ Yes ☐ No

If Yes, describe: _____

_____

_____

If the foundation design specifications and/or as-built drawings are available, please attach.

**Other Information (**that may be of importance in understanding the indoor air quality):

_____

_____

_____

**Potential Sampling Locations**

General notes on potential sample locations and type. Tentative sampling date(s) and preferred times.

_____

_____

_____

**On a separate page, draw/attach the general floor plan of the building and denote potential locations of sample collection. Indicate locations of doors, windows, ventilation system components, indoor air contaminant sources and field instrument readings**.

# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

## PART 3: Inventory of Potential Indoor Contaminant Sources:

List items/products in the building or the attached warehouse/shop that may contain site-specific contaminants of concern. Attach Safety Data Sheets (SDSs).

| Potential contaminant source | Location of Product Source | Photograph, ingredients, PID reading | Remove? Y/N |
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# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

## PART 4: Building Heating/Cooling/Ventilation Systems

*(Note: Complete this section as much as possible. Not all facility personnel or their contractors will readily have access to information in this section. Information from this section will help determine characteristics of some systems and it's impacts on vapor intrusion)*

**Systems Present**

What types of systems are used for heating, cooling and ventilation? Check all that apply.

☐ Air Handler(s) ☐ Package Units ☐ Window/Wall systems ☐ Split System

☐ Radiant heating (electric or water/steam) ☐ Evaporative Coolers ☐ Heat pump ☐ Built-up ☐ None

Comments _____

Do the systems present provide make-up/fresh air? ☐ Yes ☐ No

**Fresh air should be supplied in all commercial/industrial/institutional settings. ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*, has guidelines on how much air should be supplied. Meeting these requirements generally helps to mitigate VI impacts.**

Have the systems been evaluated for ASHRAE Standard 62 compliance? ☐ Yes ☐ No

Is a system commissioning report available? ☐ Yes ☐ No (attach)

When was the system last tested and balanced? _____ (attach report if available)

Is the ventilation system automated (building automation system)? ☐ Yes ☐ No

**Automation systems can be used to record settings during sampling and to verify HVAC operation where an HVAC remedy is required**

If yes is the data recorded or can it be recorded? ☐ Yes ☐ No

(*Note that the ventilation settings should be evaluated in the automation system and verified manually where possible.)*

**System operations**

For each of the ventilation systems describe how is outdoor air supplied?

- Economizers: _____
  - minimum and maximum settings cfm or %_____
- Manual adjustable outdoor air intakes _____
  - Settings _____
- Fixed outdoor air intakes? _____
- Unused outdoor air intake (blank panel)? _____
- Outdoor air intake not easily installed (e.g., split system, radiant heating) _____

How frequently are the ventilation systems serviced? _____

**Generally, systems should be serviced quarterly to verify performance.**

Days and hours of operation for each ventilation system _____

Do any of the ventilation systems operate during nights and weekends? ☐ Yes ☐ No

# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

If yes, are they operating on reduced settings? ☐ Yes ☐ No

Are the temperature / ventilation settings locked or routinely adjusted by the occupants? _____

What are the temperature settings? (note if seasonally variable) Days _____ Nights _____
Weekends _____

If there is an economizer, does the system control outdoor air supply using: (check all that apply)

☐ Outdoor air temperature/enthalpy ☐ $CO_2$ concentration ☐ Other _____

Is there power exhaust? ☐ Yes ☐ No

Is the power exhaust setting dependent on ☐ economizer damper position ☐ static pressure

Does the system use variable or constant air volume distribution (VAV/CAV)? _____

Is there a dedicated outdoor air system installed? ☐ Yes ☐ No

If Yes, describe: _____

**Other Ventilation Issues impacting vapor intrusion potential.**

Does the ventilation system have any underground components? _____

**Having air flow on or below the building floor can draw in vapors from the subsurface.**

Is ventilation being supplied or returned under a false floor above the building slab? _____

**This is common in server rooms**

Are ducting components routed through a basement, crawlspace, or utility vault area? _____

Is a boiler or heater present in a basement or crawlspace? _____ describe_____

Is the make-up air balanced with the exhaust fans in kitchens, laboratories and similar spaces? _____

Are there spaces of the building that are inherently at a negative pressure? _____

**Certain rooms such as kitchens are generally kept at negative pressure other rooms may be negative due to system design/use**

**Outdoor air intakes**

Where are the outdoor air intakes located? _____

Are any intakes near sources of contaminants / sewer vents? _____

Are there carbon filters present in the ventilation system? _____

What make and model of filters are present and how often are they changed? _____

# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

**Ventilation zones and settings**

| Zone/ Room | System Type | Supply Air Total cfm (range if VAV) | Supply Air % outdoor (range) | Ducted y/n | Return Air cfm | Ducted y/n |
|---|---|---|---|---|---|---|
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# Non-Residential Indoor Air Quality Evaluation Form

**Date: _____ Facility Name: _____ EPA ID No.: _____**

**Additional Notes:**