September 5, 2019

HAZARDOUS MATERIALS ANALYSIS
Harcros Chemicals
St. Paul, Minnesota

HAZARDOUS MATERIALS ANALYSIS

1.0 INTRODUCTION

Harcros Chemicals is an existing storage facility located in St. Paul, Minnesota. Currently the facility warehouses a variety of hazardous materials. Summit Fire National Consulting (SFNC) performed a hazardous materials analysis, presented here, to identify the applicable code requirements for the storage of these materials. This report addresses what building protection features are needed to comply with the code.

2.0 REFERENCES

The following code references were used in this analysis:

- 2015 Minnesota State Building Code (MSBC)[1]
- 2015 Minnesota State Fire Code (MSFC)[2]
- NFPA 13 – *Standard for the Installation of Sprinkler Systems* (2010 ed.)
- NFPA 30 – *Flammable and Combustible Liquids Code* (2012 ed.)
- FM 7-29 Ignitable Liquid Storage in Portable Containers

The Authority Having Jurisdiction (AHJ) includes the City of St. Paul, Minnesota.

3.0 BUILDING USE & OCCUPANCY CLASSIFICATION

The Harcros Chemicals facility is used for storing hazardous materials, along with offices located in the building. Chapter 3 of the Building Code requires that all structures be classified with respect to occupancy in one or more of the use groups listed in MSBC Section 302.1. Summit contacted the City of St. Paul and per their records the facility is currently listed in their system as the following:

[1] The 2015 MSBC includes the 2012 International Building Code (IBC) with Minnesota amendments
[2] The 2015 MSFC includes the 2012 International Fire Code (IFC) with Minnesota amendments

- Warehouse High Hazard (H-3 Occupancy)
- Warehouse Ordinary Hazard (S-1 Occupancy)
- Office (B Occupancy)

Although documents or additional information was not provided or available, the figure below is what Summit believes the existing layout to be based on the above city records.

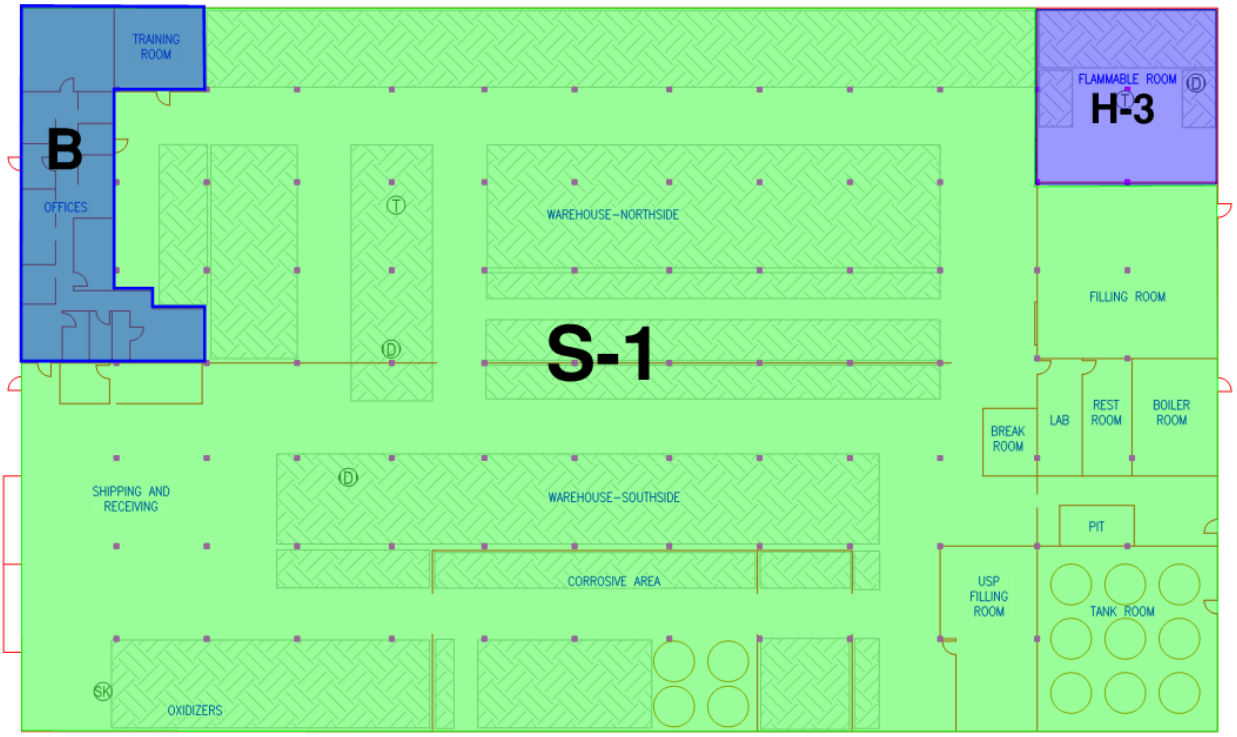

Figure 1: Existing Facility Layout

Based on our survey and information gathered, the main warehouse is used for storage of hazardous materials and the small room adjacent to the flammable storage room was utilized for Oxidizer storage. Both of these areas have the potential for requiring classification as a Group H occupancy. The next sections of this report are intended to review and confirm the occupancy classifications based on the storage of hazardous materials, and review the required and existing protection features based on these classifications.

4.0 HAZARDOUS MATERIALS ANALYSIS

4.1 Maximum Allowable Quantities (MAQ) per Control Area

The MSBC and MSFC impose MAQs for hazardous materials, in order to reduce the risk to property loss and life. When a the MAQ in any control exceeds the MAQ, the codes require the area/space to be classified as a Group H Occupancy. MSFC Section 5003.1.1 requires that the MAQ per control area be in accordance with MSFC Tables 5003.1.1(1) and 5003.1.1(2). The codes list a separate MAQ for each hazard classification, along with varying MAQs depending on whether the chemicals are in storage, open-use, or closed-use. To determine appropriate building and fire protection requirements, the codes require that all hazardous materials within a building be reviewed and classified into the appropriate hazard categories. As part of this analysis, SFNC reviewed safety data sheets and proposed hazardous material quantities provided by Harcros Chemicals. In order to review the storage versus the MAQ, the building was divided into 2 areas: the Flammable Room, which is believed to be already classified as an H Occupancy, and the Warehouse (or remainder of the building), which is currently believed to be classified as a control area and not permitted for hazardous materials above the MAQ.

Below is a summary of the hazardous materials per area based on our understadnign of current storage practices. This includes oxidizers within the “Filling Room”, products classified as flammable liquids (i.e. Class I-C) in the Flammable Room, and all other products stored within the general warehouse.

Table 1: Warehouse HazMat Storage

Hazard Classification	*Avg. Stored Quantity*	*MAQ*	*MAQ w/ Sprinklers*	*MAQ w/ Sprinklers & Cabinets*	*Units*
Corrosives Liquid	**47,555**	500	1,000	2,000	gal
Corrosives Solid	**185,879**	5,000	10,000	20,000	lbs
Class II Combustible Liquid	**419**	120	240	480	gal
Class IIIA Combustible Liquid	**4,884**	330	660	1,320	gal
Class IIIB Combustible Liquid	**15,304**	13,200	UNLIMITED	UNLIMITED	gal
Toxic Liquid	**33**	50	100	200	gal
Class II Liquid Oxidizer	**1,881**	25	50	100	gal

Table 2: Flammable Room HazMat Storage

Hazard Classification	*Avg. Stored Quantity*	*MAQ*	*MAQ w/ Sprinklers*	*MAQ w/ Sprinklers & Cabinets*	*Units*
Class IC Flammable Liquid	**551**	120	240	480	gal

The base maximum allowable quantity per control area is given by MSFC Table 5003.1.1(1 & 2). Footnotes of these tables permits the MAQ per control area to be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system. Additionally, another footnote of these tables permits the MAQ per control area to be increased 100 percent when stored in approved storage cabinets, gas cabinets, or exhausted enclosures – and also states that when both notes apply, the increases shall be applied accumulatively.

Currently, the warehouse does not have an approved sprinkler system installed and cabinets are not used to store the materials. Therefore, the base MAQ from Table 1 must be used. Harcros is over the MAQ (seen in red) for Corrosives, Class II Combustible Liquids, Class IIIA Combustible Liquid, Class IIIB Combustible Liquid, and Class II Liquid Oxidizer. The Flammable Room does have sprinklers but no cabinets are used. Therefore, the MAQ w/ Sprinklers from Table 2 can be used. Harcros is over the MAQ for Class IC Flammable Liquids even when considering the increase allowed for sprinkler protection.

Per MSBC section 307.1:

> *High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 414, based on the maximum allowable quantity limits for control areas set forth in Tables 307.1(1) and 307.1(2).*

Based on this code, in areas where the stored quantity exceeds the MAQ for that material we must classify it as a Group H occupancy.

Table 3: MAQ Exceeded Occupancy Groups

Hazard Classification	*Group When MAQ Exceeded*
Corrosives	**H-4**
Class II Combustible Liquid	**H-3**
Class IIIA Combustible Liquid	**H-3**
Class IIIB Combustible Liquid	**N/A**
Toxic Liquid	**H-4**
Class II Liquid Oxidizer	**H-3**
Class IC Flammable Liquid	**H-3**

5.0 RECOMMENDATIONS FOR COMPLIANCE

As discussed in Section 4 of this report, an analysis was conducted to determine quantities of the materials on site. Per the hazardous material classifications and quantities provided, SFNC recommends classifying the warehouse as an H-4 occupancy and the Flammable Room and "Filling Room" as H-3 occupancy room to comply with the MSBC and MSFC requirements. The proposed layout of the building is shown below.

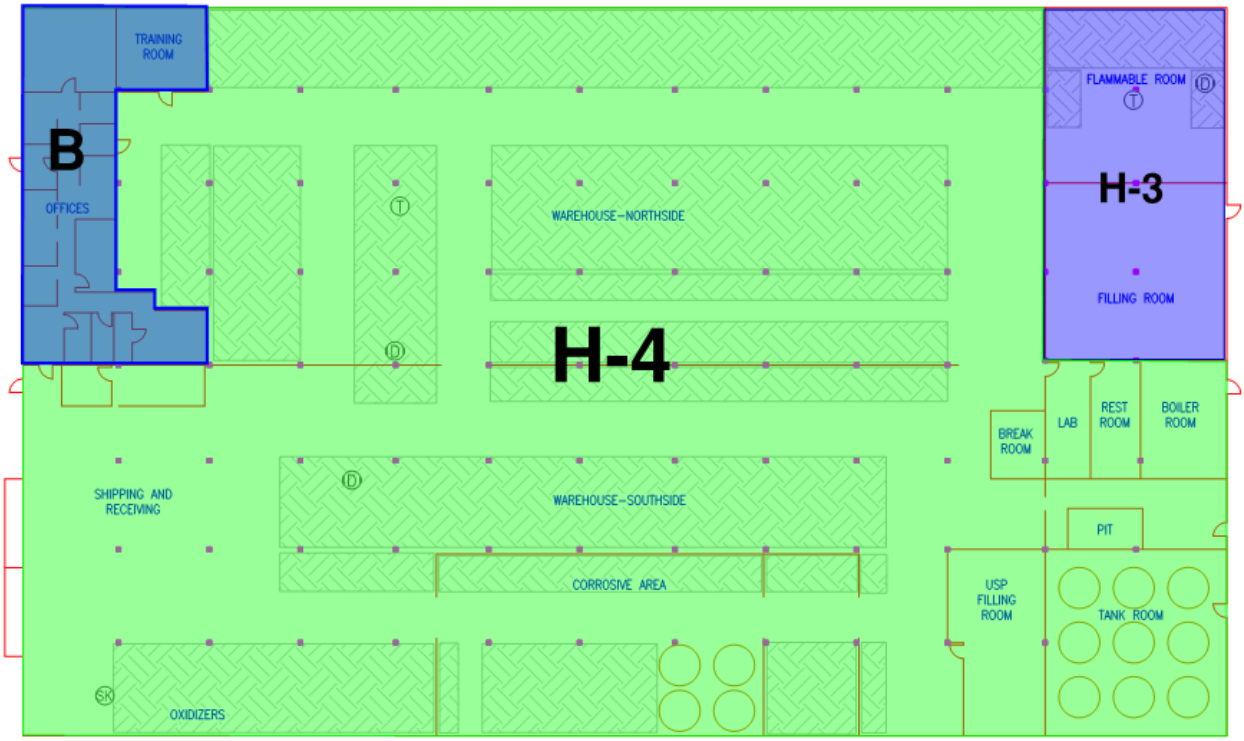

Figure 2: Proposed Occupancy Classification Layout

To meet this recommendation, all flammable and combustible liquids (Class I, Class II, and Class III-A liquids) need to be kept within the Flammable Room and all Oxidizers should be stored within the "Filling Room". The remainder can be stored within the warehouse. Class III-B combustible liquids may be stored in either area and still comply with the proposed occupancy classifications, however it may be beneficial due to sprinkler protection requirements to store some Class III-B liquids within the flammable room, specifically items stored within plastic or non-metallic containers or totes.

5.1 Group H-4 Occupancy

An H-4 occupancy was chosen for the entire warehouse to help with the excess amount of Corrosives. With an H-4 occupancy, the amount of corrosives becomes unlimited and allows for storage anywhere in the warehouse. Per the MSBC section 307.6, health hazards like corrosives must be classified as H-4.

Requirements for H-4 occupancies are as follows:

- Automatic Sprinkler Protection
- Spill Control & Secondary Containment
- Ventilation
- Separation of incompatible materials
- Standby or Emergency Power
- Emergency Alarm & Supervision
- Non-combustible floors

Because an automatic sprinkler system is required in an H-4 occupancy, the MAQ for Class IIIB's becomes unlimited.

5.2 Group H-3

An H-3 occupancy would be required for the storage of the Class II & IIA Combustible Liquids, the Class II Liquid Oxidizers, and the Class IC Flammable Liquids. Both the flammables room and the filling room will house these chemicals. With an H-3 occupancy, the quantity of Class II & IIA Combustibles, Class II oxidizers, and Class IC flammables are allowed to exceed the MAQ and are essentially unlimited (additional requirements apply when amounts start to exceed 15,000 gallons).

Group H-3 occupancy requirements are generally the same as H-4 occupancies. In addition, per the MSBC, 25 percent of the H-3 room perimeter shall be an exterior wall.

5.3 Construction & Allowable Area

The Harcros facility is assumed to be Type II-B construction (unprotected, non-combustible) per the MSBC, all wall construction and concealed areas were not confirmed but all main structural elements, exterior walls etc. were noted as non-combustible. The building has an approximate footprint of 42,400 ft^2 and is 1 story with a deck of 20 ft. or less (this exact height should be confirmed prior to performing sprinkler upgrades or similar).

For a Group H-4 occupancy in a Type II-B building with an automatic sprinkler system (required for all H occupancies), Table 503 gives a maximum allowable area of 70,000 ft^2. For a Group H-3 occupancy, Table 503 lists a maximum allowable area of

14,000 ft^2. For a Group B occupancy, Table 503 gives a maximum allowable area of 92,000 ft^2. Based on the proposed layout, the Office Group B space would be ~2,000 ft^2 , the H-3 room (flammables room & filling room) would be ~3,000 ft^2, and the H-4 space (rest of building) would be ~37,400 ft^2.

Based on the above and classifying the building as a mixed use with separated occupancies, the building will comply with minimum construction requirements as a Type II-B construction type.

All occupancies are required to be separated from other occupancies with fire barriers complying with MSBC Section 707. MSBC Table 508.4 requires that B, H-3, and H-4 rooms all have a 1-hour separation from each other (assumed a sprinklered building). Openings in 1-hour fire barriers must have a minimum fire-resistance rating of 3/4 hour. Based on our survey the Flammable Room appeared to have a minim of 1-hour construction with protected openings and the Filling Room also appeared that it was intended to have at least 1-hour rated construction. A detailed review and minor upgrades are likely required to ensure that these separation s are maintained and compliant. The office space did not appear to current meet 1-hour construction and would need to be upgraded in order to comply with the 1 hour separation requirement.

6.0 REQUIREMENTS FOR H-3 & H-4 OCCUPANCIES

6.1 Automatic Sprinkler Protection [MSFC – 5004.5]

An automatic sprinkler system is required for both Group H-3 & H-4 rooms. The protection is based on the criteria set in NFPA 13 *Installations of Sprinkler Systems* and NFPA 30 *Flammable and Combustible liquids.* Where different classes of liquids, container types, and storage configurations are stored in the same area, requirements for the most severe fire hazard shall be met. See section 7.0 for criteria and further discussion.

6.2 Spill Control & Secondary Containment [MSFC – 5004.2]

The Group H-3 & H-4 Rooms will contain an aggregate quantity of hazardous materials exceeding 1,000 gallons. Therefore, MSFC Section 5004.2 states that it must be provided with spill control and secondary containment in accordance with MSFC Section 5704.3.7.3.

Spill control and secondary containment may be achieved by providing liquid-tight sloped or recessed floors, or automatic spill barriers – sized to contain the spill from the largest container plus 20 minutes of sprinkler water flow. The room or containment area used and the design of the sprinkler system significantly affect the height of the curb or barrier. At a minimum it is recommended that three (3) containment areas be formed/used based on the layout, different occupancies, and different hazard classes

involved. The Flammable Room should be its own containment area, the "Filling Room" with oxidizer storage would be a second containment area, and either the entire Warehouse or portion of the Warehouse (where hazardous materials are stored) would be a third containment area.

Estimated curb height for each is as follows:

- Flammable Room – 24 inches
- Filling Room/Oxidizers – 12 inches
- Warehouse – 3 inches *(assumes 35,000 ft^2 containment area)*

6.3 Continuous Ventilation [MSFC 5004.3]

The Group H-3 & H-4 Rooms are required to have continuous ventilation in accordance with the following requirements of MSFC Section 5004.3:

- Installed in accordance with the 2015 Minnesota Mechanical and Fuel Gas Code
- Minimum 1 cubic foot per minute (CFM) per square foot of floor area
- Shall operate continuously
- Manual shut-off (break-glass or other approved type) provided outside the room in an approved location adjacent to the access door to the room. Labeled: "VENTILATION SYSTEM EMERGENCY SHUTOFF".
- Ventilation shall be design to consider the potential fumes of vapors released. For fumes or vapors that are heavier than air, exhaust shall be taken from a point within 12 inches of the floor. For fumes or vapors that are lighter than air, exhaust shall be taken from a point within 12 inches of the highest point of the room
- Exhaust air shall not be recirculated to occupied areas

6.4 Separation of Incompatible Materials [MSFC – 5004.4]

Storage of hazardous materials are required to be separated from incompatible materials in accordance with MSFC Section 5003.9.8. Separation may be accomplished using one of the following methods:

- Segregate incompatible materials in storage by at least 20 feet.
- Isolate incompatible materials in storage by a noncombustible partition that extends at least 18 inches above and to the side of the stored material
- Store liquid and solid materials in material storage cabinets.

Note that oxidizers are typically assumed to be incompatible with all other materials and need ot meet the above requirements and sometimes additional requirements. By

storing these in their own dedicated room will comply. Codes and standards also recommend storing oxidizers a minimum of 2 ft. away from walls.

6.5 Standby/Emergency Power [MSFC - 5004.7]

The Group H-3 & H-4 Rooms are required to be provided with Standby/Emergency Power. Mechanical ventilation, alarm detection, and other electrically operated systems are required to be provided with emergency or standby power in accordance with NFPA 70 and MSFC Section 604. Alarm systems are normally are provided with battery back-up that would meet this requirement, so the only system that will likely require emergency/standby power would be the required ventilation system(s).

6.6 Emergency Alarm [MSFC - 5004.9]

The Group H-3 & H-4 Rooms are required to be provided with an emergency alarm system in accordance with MSFC Section 5004.9.

- Provide a manual pull station outside each interior exit or exit access door to the Group H-3 & H-4 Rooms
- Activation of an emergency alarm initiating device shall sound a local alarm to alert occupants of an emergency situation (local alarm)
- Emergency alarm is separate from the fire alarm system, it is also recommended that alternate color and different audible signals from standard fire alarm equipment be used and signage as required be provided.
- Emergency alarm must be constantly monitored. It is recommended that activation of the emergency alarm activate a supervisory signal at the fire alarm control panel

6.7 Noncombustible Floor [MSFC - 5004.12]

The Group H-3 & H-4 Rooms are required to be provided with floors of noncombustible construction. H-4 occupancies containing corrosives also are required to be liquid tight construction, this is also required when areas are used for secondary containment.

6.8 Container Types [MSFC - 5704.3.1]

The code puts restriction on the type and size of portable containers that can be used for the storage of Class I, II, and III-A flammable/combustible liquids. Class III-B liquids are allowed in to any container type but sprinkler protection options are limited or do not exist for larger non-metallic (i.e. plastic or composite) containers, especially for portable tanks or totes. Containers for other hazard classes are not restricted in this same fashion.

MSFC Section 5704.3.1 states that containers for Class I, II, and III-A liquids must comply with requirements of this section and NFPA 30. The MSFC goes on to specifically state that rigid nonmetallic intermediate bulk containers stored indoors must shall be listed and labeled in accordance with UL 2368, *Standard for Fire Exposure Testing of Intermediate Bulk Containers for Flammable and Combustible Liquids*. This standard requires totes to be fire tested, there are very few products listed to this standard, and those that are typically require a cover or similar additional protection beyond the container itself.

NFPA 30 provides the following summary table that summarizes the allowed container types for Class I, II, and III-A liquids.

Table 4: Maximum Allowable Container Size

	Flammable Liquids			Combustible Liquids	
Container Type	**Class IA**	**Class IB**	**Class IC**	**Class II**	**Class IIIA**
Glass	1 pt (0.5 L)	1 qt (1 L)	1.3 gal (5 L)	1.3 gal (5 L)	5.3 gal (20 L)
Metal (other than drums) or approved plastic	1.3 gal (5 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)
Safety cans	2.6 gal (10 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)	5.3 gal (20 L)
Metal drum (e.g., UN 1A1/1A2)	119 gal (450 L)	119 gal (450 L)	119 gal (450 L)	119 gal (450 L)	119 gal (450 L)
Approved metal portable tanks and IBCs	793 gal (3000 L)	793 gal (3000 L)	793 gal (3000 L)	793 gal (3000 L)	793 gal (3000 L)
Rigid plastic IBCs (UN 31H1 or 31H2) and composite IBCs with rigid inner receptacle (UN31HZ1)†	NP	NP	NP	793 gal (3000 L)	793 gal (3000 L)
Composite IBCs with flexible inner receptacle (UN31HZ2), DOT/UN-approved flexible IBCs, and NMFC/ISTA-compliant IBCs†	NP	NP	NP	331 gal (1300 L)	331 gal (1300 L)
Non-bulk bag-in-box	NP	NP	NP	NP	NP
Polyethylene UN1H1 and UN1H2, or as authorized by DOT exemption	1.3 gal (5 L)	5.3 gal (20 L)*	5.3 gal (20 L)*	119 gal (450 L)	119 gal (450 L)
Fiber drum NMFC or UFC Type 2A; Types 3A, 3B-H, or 3B-L; or Type 4A	NP	NP	NP	119 gal (450 L)	119 gal (450 L)

NP: Not permitted for the container categories so classified unless a fire protection system is provided that is developed in accordance with 16.3.6 and is approved for the specific container and protection against static electricity is provided.
*See 9.4.3.1.
†See 9.4.3.2.

Based on the above information non-metallic totes are not allowed for flammable and combustible liquids except those classified as Class III-B liquids or listed under UL 2368. It is also recommended that Class III-B liquids be stored in metallic totes and drums to lessen the fire risk of these products. As noted in the table smaller plastic or non-metallic containers are acceptable but still can have significant consequences on the sprinkler design requirements.

6.9 Fire Detection [MSFC - 6304.1.6]

An approved supervised smoke detection system shall be provided in oxidizer storage area. Activation of the smoke detection system shall sound a local alarm.

Other areas are not specifically required by code to have fire detection based on the hazards present.

7.0 AUTOMATIC SPRINKLER PROTECTION CRITERIA

As stated in Section 6.1, automatic sprinkler protection is required in both H-3 & H-4 occupancies. Based on this and the proposed layout of the facility, it is therefore recommended that the entire building be provided with automatic sprinkler protection throughout. Sprinkler protection in any area is based on the highest fire hazard and is the basis for the criteria listed in the tables below. In addition, the sprinkler criteria noted below assumes that no non-metallic toes/IBCs are used for storage of Class I, II, or III-A liquids as it is not an acceptable container type for these materials (see Section 6.9 of this report for more info).

The tables below highlight some of the specific higher hazard protection criteria storage throughout the building.

Table 5: Class I-C Non-Miscible Liquids in Metal IBCs

Reference: NFPA 30 Table 16.5.2.2		
• Storage arrangement:	Palletized	
• Container:	Metal IBCs	
• Maximum ceiling height:	30 ft.	
• Maximum storage height:	2-high	1-high
• Ceiling design:	Density = 0.60 gpm/ft^2 Design Area = 3,000 ft^2 Sprinklers = high temperature, standard response, K ≥ 11.2 sprinklers	Density = 0.30 gpm/ft^2 Design Area = 3,000 ft^2 Sprinklers = high temperature, standard response, K ≥ 8.0 sprinklers.
• Hose stream allowance:	500 gpm	

Table 6: Class II & III-A Non-Miscible Liquids in Plastic Drums[3]

Reference: FM Data Sheet 7-29 (NFPA 30 criteria not available)	
• Storage arrangement:	Palletized
• Container:	≥ 1 gal. plastic containers
• Maximum ceiling height:	30 ft.
• Maximum storage height:	5 ft.
• Ceiling design:	Design Area = Entire Room Required Pressure = 75psi Sprinklers = high temperature, standard response, K ≥ 11.2 sprinklers. *(note other K-factor and pressure combinations are available)*
• Hose stream allowance:	500 gpm

Table 7: Class III-B Non-Miscible Liquids in Nonmetallic IBCs

Reference: NFPA 30 Table 16.5.2.9 ***Note that criteria is for UL 2368 listed containers only, criteria does not exist in NFPA 30 for non-listed IBCs but provides idea of required protection. Design would be subject to approval by the AHJ.***		
• Storage arrangement:	Palletized	
• Container:	Nonmetallic IBCs	
• Maximum ceiling height:	30 ft.	
• Maximum storage height:	2-high	1-high
• Ceiling design:	Density = 0.60 gpm/ft^2 Design Area = 3,000 ft^2 Sprinklers = high temperature, standard response, K ≥ 11.2 sprinklers	Density = 0.45 gpm/ft^2 Design Area = 3,000 ft^2 Sprinklers = high temperature, standard response, K ≥ 11.2 sprinklers.
• Hose stream allowance:	500 gpm	

[3] Note Class I liquids are not allowed in plastic containers above 5.3 gallons

Table 8: Class III-B Non-Miscible Liquids in Metal IBCs

Reference: NFPA 30 Table 16.5.2.2		
• Storage arrangement:	Palletized	
• Container:	Metal IBCs	
• Maximum ceiling height:	30 ft.	
• Maximum storage height:	2-high	1-high
• Ceiling design:	Density = 0.50 gpm/ft^2 Design Area = 3,000 ft^2 Sprinklers = high temperature, standard response, K ≥ 11.2 sprinklers	Density = 0.25 gpm/ft^2 Design Area = 3,000 ft^2 Sprinklers = high temperature, standard response, K ≥ 8.0 sprinklers.
• Hose stream allowance:	500 gpm	

Table 9: Class 2 Liquid Oxidizers

Reference: NFPA 400	
• Storage arrangement:	Palletized or bulk
• Container:	Any
• Maximum ceiling height:	Any
• Maximum storage height:	8 ft.
• Ceiling design:	Density = 0.20 gpm/ft^2 Design Area = 3,750 ft^2 Sprinklers = high temperature
• Hose stream allowance:	500 gpm

It can be seen from all of the above criteria that the requirements for sprinkler protection are significantly demanding for the hazards and specifically when protecting plastic containers with flammable or combustible liquids. Therefore, it is recommended that plastic containers be limited and changed to metal to make the design and cost of installing a sprinkler system more manageable. The design of the existing system is not documented or specifically known but based on our review and analysis Summit is confident that the existing system is not adequate as installed.

A final point to make related to sprinkler protection for the facility, Summit obtained information on a recent hydrant flow test near site. The results of that test are summarized below.

Table 10: Flow Test Data

Static Pressure:	38 psi
Residual Pressure:	17 psi
Flow Rate:	938 gpm

Although it may not be obvious, the test data show extremely poor water supply to or near your facility. The test indicates that it does not even meet the minimum fire flow[4] requirements (1,500 gpm at 20 psi) for any building. Additionally, the water supply if accurate indicates that none of the sprinkler design criteria stated can be provided without both a fire pump and water storage tank. It is possible that the test is not accurate due to some short-term impairment when the test was taken or indicates an issue with the water distribution in the area, such as a closed valve. It is something that should be further investigated and potential discussed with the City or local water department immediately and for sure prior to under taking any sprinkler upgrades.

[4] water supply at site hydrant for firefighting purposes

8.0 SUMMARY

Harcros Chemicals is storing hazardous materials in a warehouse in St. Paul, Minnesota. The facility is currently over the MAQ's for the materials they have including flammable/combustible liquids, corrosives and oxidizers. Per the City of St. Paul's records the facility has a permit for High Hazard (H-3) storage but specifics on what that included was not known, but it is assumed to be for the flammable room.

The analysis indicates that the storage would require that the warehouse and "Filling Room" (Oxidizers) would ne dot be classified as H Occupancies as well. Summit summarized the requirements to bring the facility up to requirements for the current storage conditions.

Based on the current permits, Harcros would not be required to make upgrades by the City of St Paul, even though it does not meet current or recent requirements, if the storage above MAQ was limited to the flammable and combustible liquids and stored only in Flammable Room. This is because Summit believes that is what was previous permited and approved. However, given the current conditions and storage the facility should be brought up to current requirements as outlined in this report.

Additional, during research it was found that recent hydramt flow test indicate concern with the water supply to the building. It is recommended that this be investigated further to find possible issue and help future sprinkler design/install work.

Please contact our office with any questions concerning this analysis.