
CRESTON FIRE DEPARTMENT INTERIM MEASURES REPORT



April 4, 2018

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RELIANCE

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CONTENTS

DISCLAIMER	2
RELIANCE	2
EXECUTIVE SUMMARY	4
<i>Town of Creston Occupational Health & Safety Policy</i>	6
RECOMMENDATIONS	7
<i>Risk Assessment Practices:</i>	7
<i>Procedural Documentation:</i>	8
Facilities:.....	8
Equipment:	9
BACKGROUND	11
CURRENT STATE ANALYSIS	11
<i>Cancer in the Fire Service</i>	20
<i>Exposure Routes</i>	22
Inhalation	22
Absorption	22
Effects of Heat:	23
Secondary Exposures:	23
<i>Exhaust Contamination of Fire Station</i>	23
<i>Personal Protective Equipment</i>	24
<i>Occupational Health and Safety Regulation Section 5.54 Exposure Control Plan</i>	25
<i>Exhibits:</i>	26
<i>Resources</i>	27

EXECUTIVE SUMMARY

The Town of Creston has identified the need to update their fire protection facilities to address operational and other shortfalls in the current fire hall. The Creston fire hall, a repurposed grocery store, has served the Town well since 1982, but has outlived its functional lifespan. The building, while providing an effective home for fire services for 35 years, is unable to support the requirements of a modern volunteer fire service due to a lack of space and an array of spatial and functional concerns. Plans are underway to develop updated fire station facilities for the Department.

The development of the business case for updated fire department facilities included identification of deficiencies in the current building. A consultation with the Town's firefighters identified several serious health and safety concerns regarding the existing fire station. The firefighter concerns included:

- Exhaust emissions from fire apparatus are not controlled, resulting in contamination of gear and sanitary areas including offices, breathing apparatus fill and storage areas as well as offices and other "clean" areas of the facility,
- Contamination from fire protective clothing and equipment is being introduced into the fire station following incidents. These contaminants include blood and body fluids, and a host of post fire chemicals and toxins, many of which are known or suspected carcinogens,
- General concerns regarding spatial restrictions in terms of operations, including vehicle movements, storage of firefighter protective clothing and overhead spatial restrictions.

There is general recognition that these deficiencies will need to be managed during the transition from the current facility through the process of construction and to the occupancy of the new facility. This report provides an analysis of the identified deficiencies and provides a road map to address WorkSafeBC Occupational Health and Safety Regulations that is anchored to fire protection standards including:

- National Fire Protection Association (NFPA) 1500 Standard on Occupational Health, Safety and Wellness Programs
- NFPA 1851 Standard for the Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting, and
- Industry best practices

It should be clearly understood that this report does not presuppose a specific solution. What is certain is that the status quo is not an option that can be considered. The identified deficiencies must be addressed in the short term and will require the collective wisdom and creativity of Council and the Community Fire Hall Advisory Select Committee to determine the permanent solution.

As presented, the Interim Measures Report follows a risk management approach that starts with the Town of Creston's commitment to a safe and healthy workplace followed with structured recommendations to achieve an appropriate level of safety for staff and residents while meeting legislated workplace health and safety objectives. All the report's recommendations are supported by a series of exhibits attached to the report that provides detailed contextual guidance to the Town administration.

TOWN OF CRESTON OCCUPATIONAL HEALTH & SAFETY POLICY

It is the policy of the Town of Creston to provide a safe work environment that is designed, operated and maintained in accordance with occupational health and safety standards.

It is the responsibility of the Town of Creston management to develop, implement and maintain programs designed to prevent injuries and occupational diseases throughout the Town of Creston workplaces by ensuring that health and safety hazards are controlled or eliminated, and by developing work procedures conducive to a healthy and safe workplace.

It is the responsibility of every supervisor to ensure that all workers are instructed in and follow all safe work procedures, regulatory requirements and collective agreement provisions.

It is the responsibility of all workers to follow proper safe work procedures and to monitor their workplace for unsafe conditions and hazards.

Through the active participation and cooperation of management, supervisors, workers and joint health and safety committees, the Town of Creston will promote healthy and safe working conditions and attitudes as integral parts of its operations.

Any worker or supervisor not complying with safe practices and procedures, including the provisions of the Occupational Health and Safety program may be subject to discipline, in accordance with the Town of Creston Progressive Discipline Policy.

The following report provides a practical application of both the intent and the letter of the Town of Creston's Occupational Health and Safety Policy.

RECOMMENDATIONS

All the recommendations in this report are supported by a combination of industry accepted practices, manufacturer's instructions, internationally accepted fire service standards and related WorkSafeBC regulations. Taken in their entirety, these recommendations provide a simplified risk management approach to address identified and potential exposure and safety risks. While some of the recommendations are specifically intended to bridge into an updated facility, many are the basis of effective hazard management processes that should continue subsequent to a move into updated facilities.

The recommendations are supported by several exhibits referenced at the rear of this report. These provide specific direction or examples of options that may be modified to meet the unique nature of the Creston Fire Department.

RISK ASSESSMENT PRACTICES:

1. A hygiene evaluation of the Creston fire station, equipment, and personal protective equipment should be conducted by a qualified third party to determine the levels of contamination that currently exist, effectiveness of current decontamination efforts and to identify specific issues. Results of the analysis should be used as the basis for development of the required exposure management plan. Ongoing monitoring should continue through the implementation of hazard control processes to ensure compliance with requirements and to evaluate the effectiveness of controls.
2. The addition of hazardous materials exposure risk should be included in risk management planning for all operations. Many of the exposure risks can be identified in an effective scene size up with appropriate strategies to manage potential contamination implemented at the scene and carried on back to the station. Application of defined processes in NFPA Standards and manufacturers guidelines should be implemented.
3. It is impossible to eliminate completely the potential exposure of fire fighters to work related carcinogens and toxins. Therefore, an aggressive detection and health monitoring program should be considered for all fire fighters. A guide for fire fighters physicians should be developed that details the considerations a physician need to be evaluating when performing a regular medical checkup for a firefighter. The Town should consider implementing a **mandatory** requirement for all firefighting personnel to obtain a physical at least once every 24 months and preferably annually. All firefighters coming into the Creston Fire Department should have a baseline examination using the same criteria prior to being placed on active duty.
4. The Fire Department workplace health and safety committee should be linked to the Town's Joint Health and Safety Committee. Regular meetings should be

scheduled, and the Town, Fire Department Management and Fire Fighters should commit to meeting as scheduled to meet the directives of the Town of Creston Occupational Health and Safety Policy.

PROCEDURAL DOCUMENTATION:

5. Specific decontamination, infection and exposure control standard operating guidelines (SOG's) should be developed and implemented. These SOG's should be anchored to recognized fire protection and infection control standards (i.e. NFPA) or other demonstrated leading practices and need to include WorkSafeBC exposure registry protocols.
6. A decontamination procedure should be developed following recommended practices identified in NFPA 1500 and manufacturer's specifications for all PPE and personnel. This should include prohibitions on bringing contaminated gear into enclosed spaces, including apparatus, cleaning and maintenance procedures and storage solutions that minimize secondary contamination risks from apparatus and exhaust.
7. A procedure for the cleaning and decontamination of fire department vehicles should be developed. This procedure should also consider proactive processes including a prohibition on the transport of grossly contaminated PPE inside passenger areas of apparatus.
8. Safe work practices around working in elevated places, low overhead spaces and alternative procedures where the work cannot be safely completed should be considered. The process for development of the work practices should include appropriate personal protective equipment beyond that issued for firefighting and rescue operations.
9. A safe movement policy on the movement of vehicles into and out of the fire station should be developed and implemented. The SOG should include reference to acceptable bystander behaviours, and instructions to spotters and drivers on how to identify and manage safe and unsafe practices. The SOG should include restrictions on activities in proximity of vehicles when moving vehicles and a two-spotter rule.
10. Operating procedures related to fire suppression should be developed that are based on a transitional fire attack methodology focused on cooling the fire prior to firefighter entry. A focus on reducing the exposure risk to firefighters should be a foundational planning principle for all operational Standard Operating Guidelines (SOG's).

Facilities:

11. Consideration should be given to making the current fire station an "operations only" facility. This would include:

- a. To minimize the negative health impacts of sustained exposures of career staff to potential contamination in the fire station, all fire department administrative personnel, including the Fire Chief should be relocated out of the fire station and into other facilities.
 - b. The spaces currently occupied for administration should then be repurposed for “clean” functions including breathing apparatus maintenance and clean equipment storage.
 - c. Classroom and other meeting spaces could, as an interim measure, be accommodated in the fire department training ground and other Town owned facilities.
 - d. Current work and servicing spaces should be evaluated for the development of temporary shower and hygiene facilities in a gender respectful manner.
12. The development of an interim vehicle exhaust mitigation strategy to ensure that maximum exposure threshold limits for diesel exhaust is not exceeded for staff operating in the fire station. This should include operational directives on starting and operating vehicles, rules on door openings and duration of engine operations inside the station.
13. The current exhaust and makeup air fans installed in the fire station apparatus bays do not appear to be providing an acceptable level of air exchange. An engineer should be considered to evaluate these fans and make recommendations on improvements to ensure effective air exchange on all areas of the floor spaces. An acceptable solution will depend on decisions made on how operations will be amended as per Recommendation 11.
14. Professional cleaning services should be considered for all areas of the fire station, except the fire apparatus bays. These services should include periodic cleaning of the office carpets and all wall surfaces and the application and maintenance of floor finishes to assist in improving overall facility hygiene. Fire department personnel should be able to provide daily cleaning between scheduled cleaning services.

Equipment:

15. All breathing apparatus masks should be stored in manufacturers supplied storage bags to ensure that they remain clean and sanitary between uses and cleaning.
16. Soiled and contaminated personal protective gear should be cleaned in accordance with manufacturer’s recommendations and in accordance with the requirements of NFPA 1500 and NFPA 1851.
17. The use of gear bags and protective covers for firefighting ensemble that can protect cleaned gear from accidental contamination by vehicle exhaust or other contaminants should be evaluated.

18. Spare gear in front line condition in a range of sizes appropriate to the department should be provided to ensure that contaminated gear can be taken immediately out of service and cleaned appropriately.
 - a. Spare equipment including gloves and hoods should be issued to all fire fighters to ensure that they have a spare so that these items can be laundered immediately after every use. Policies including a prohibition on carrying the spares in their pockets should be developed.
 - b. Firefighter bunker gear should be available in a range of sizes to accommodate fire fighters. There is no requirement to issue every fire fighter a dedicated set of spare gear.
19. All fire fighters should be required to maintain a set of clothing, including under garments, in which to change into prior to departure from the fire station. Mandatory decontamination procedures should apply to any firefighter who may have been exposed to the products of combustion or biological hazards.

BACKGROUND

This report is narrowly focussed on providing recommendations on the development of an exposure control plan. While this WorkSafeBC guideline does not speak directly to firefighting, the basis of the direction to follow a risk managed approach in identifying and mitigating potential exposures is a completely appropriate process. Standards such as the National Fire Protection Association (NFPA) 1500 and 1851 provide the industry specific technical requirements to create an effective program.

CURRENT STATE ANALYSIS

A site review of the Creston Fire Station was conducted on March 6-7, 2018. The review noted a range of concerns regarding the facility and its ability to adequately support safe and efficient operations of the fire department. It also revealed that measures that were adopted over the years to manage some of the concerns are not currently effective.

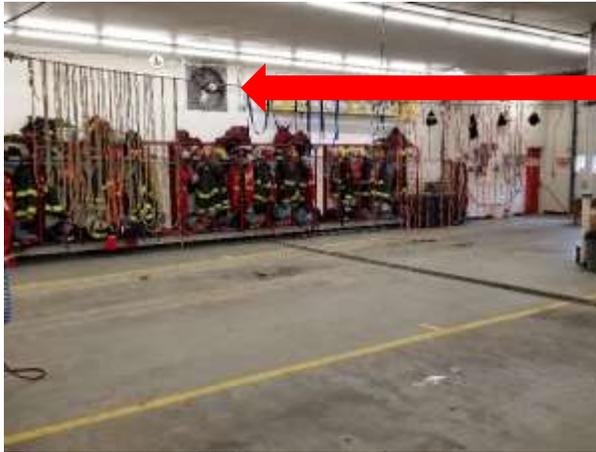
The fire station is a renovated grocery store. Interior partition walls were installed over the years to separate functional areas of the department, and to separate administrative areas from the apparatus floor housing fire department vehicles and equipment. The buildings heating and ventilation system is shared by both the administration areas and the equipment bay. There is no vapour separation between the administrative areas and the equipment bays.



FIGURE 1: CRESTON FIRE STATION 1

There is no specific vehicle exhaust management system installed in the building. At some point in the buildings history a pair of large capacity exhaust fans were installed to address concerns of vehicle exhaust contamination of the fire station. The fans can be triggered manually and are turned on automatically when the overhead doors are opened. The fans are located on either side of the bays close to the ceiling. These fans are supported by a makeup air fan that pushes makeup air into the building. This makeup air is not heated which does cause significant temperature changes depending upon the

weather. Initial evaluations indicate that the fans do move a large volume of air but are not effective in removing vehicle exhaust from large areas of the apparatus bays. Fire apparatus is much larger than when these fans were installed and cause significant interference in air flows. Prevailing winds from the west frequently pressurize the building and force contaminants into the administrative areas to the rear.



Exhaust fan. There are two of them on opposing walls with a makeup air fan on the north wall.

FIGURE 2: EXHAUST FAN



FIGURE 3: REDUCED CLEARANCE BETWEEN AERIAL TRUCK AND CEILING

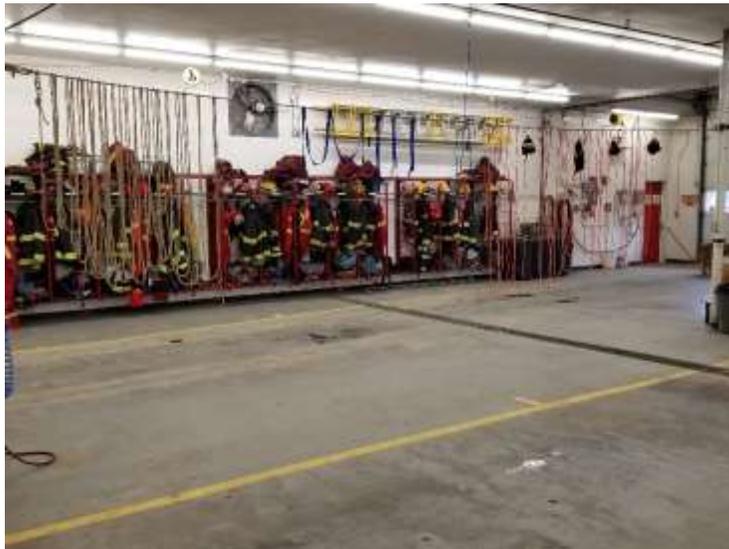
There is a gas detection system installed in the building to monitor vehicle exhaust emissions on the apparatus bays. A detector head inside the overhead doors provides the sole monitoring site. It is not clear that the detection system has received proper maintenance and there is a limited Departmental understanding for how it works. There is no other chemical or gas detection devices in the building. Positioning of the detection head near the front doors may not provide effective measurement and warning of contamination. The system was installed by local electricians with limited technical

support. It is not clear whether the sensors have been serviced in accordance with manufacturers requirements.



FIGURE 4: EXHAUST DETECTION SYSTEM

The firefighter personal protective equipment is stored in the fire station in open mesh cubicles along each wall and in an island between fire department vehicles. This installation is a relatively standard arrangement in fire stations across Canada. There is no protection for the gear from ultraviolet degradation and the gear is exposed to possible contamination from vehicle exhaust, fire station activities and post incident cleanup and decontamination.



General storage of items like rescue equipment, fire hose and other operational equipment and supplies are extremely limited. This results in storage of sensitive equipment on the apparatus floor between fire trucks. This contributes to several issues

including congestion, limited space for operational checks and maintenance, and secondary contamination from cleaning and vehicle operations. While not forming a recommendation in terms of this report, consideration might be given to moving the trailer to another storage area to free up some functional space on the apparatus floor.



FIGURE 5: STORAGE ISSUES IN THE FIRE STATION

The fire station is equipped with limited washrooms and shower facilities. These facilities, however, are located inside the administration section of the building. The washrooms are utilized by staff and anyone from the public who are visiting or working in the station. There is only one shower in the building located inside the men's washroom, which is inadequate for operational requirements. There are no provisions for shower facilities for female firefighters. There is no storage space to allow for lockers for firefighters to store personal hygiene materials and spare clothing. Neither washroom offers sufficient space or design amenities to be used for decontamination purposes.



FIGURE 6- MENS WASHROOM

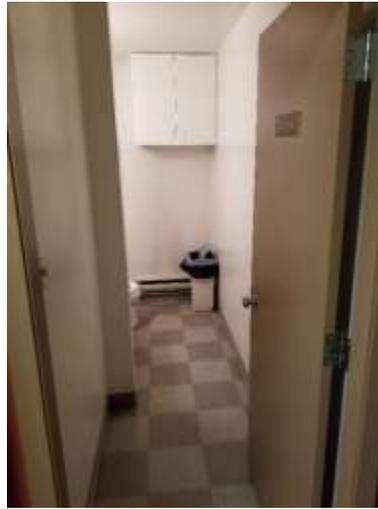


FIGURE 7: WOMENS WASHROOM

Administration areas of the fire hall are located immediately adjacent to the fire apparatus bays. There are doors, but they are not vapour protected and allow products of combustion to migrate through. The admin areas share heating equipment with the apparatus bays as well. When the large doors are open, prevailing west winds pressurize the spaces, forcing exhaust and other contaminants into the admin areas. There is no transition area between the administrative spaces, including a kitchen, and the outdoors and apparatus bays. As a result, dirt and contaminants walk directly into these areas.



FIGURE 8: FIRE ADMINISTRATION AREA

There is a heavily utilized training and meeting space at the rear of the fire station. While the overall space is adequate for most functions, it contains little storage and is open to the same contamination as the rest of the building. This room also serves extensively as

a place to conduct public education and training opportunities, potentially exposing children and members of the public to the same contaminants that firefighters are exposed to at fire scenes and in the apparatus bays.



FIGURE 9: TRAINNG ROOM

A heavy duty washing machine is provided for the cleaning of fire fighters personal protective equipment. The space is adequate and reasonably well appointed in terms of cleaning and post exposure decontamination. It is attached to a hallway that connects directly with administration areas, including public washrooms, and represents a significant secondary exposure risk to staff and visitors. There were no obvious indications that adequate PPE for those fire fighters assigned cleaning functions is being provided. Proper protection would include eye protection, chemical resistant gloves, disposable coveralls and proper respiratory protective gear. There were no posted cleaning or laundry instructions in the laundry room. There is no laundry equipment (separate washer and dryer) available that would permit fire fighters to clean contaminated personal clothing.



FIGURE 10: LAUNDRY FACILITY IN FIRE STATION

The fire department had an enclosed mezzanine area located above the administrative areas of the building. Access to the mezzanine is provided through the fire station apparatus bays. There is no other exit from this space. This area has a low ceiling and is fully open to contamination from the apparatus floor. Storage in this area includes obsolete equipment as well as new and cleaned personal protective equipment and tools. The local Air Cadet Squadron stores some materials in this space as well. The space also accommodates important information technology infrastructure for the Town.



FIGURE 11: MEZZANINE STORAGE AREA



FIGURE 12: AIR CADET STORAGE



FIGURE 13: MEZZANINE NEW AND CLEANED EQUIPMENT STORAGE



FIGURE 14: MEZZANINE- IT INFRASTRUCTURE

There are two rooms on the administration side of the building dedicated to maintenance of self-contained breathing apparatus and filling of the air cylinders. The refilling room is isolated from all other work spaces and is adequate for the function. The equipment repair area is adequate, although it is exposed in some fashion to potential contamination from the apparatus bays and through migration of contaminants into the area through other maintenance activities. This potential contamination is manageable through the development of effective decontamination and hygiene policies for the space, including decontamination of equipment and harnesses on the apparatus area and thorough cleaning of work spaces prior to mask cleaning or other operations.



FIGURE 15: SCBA REFILLING ROOM

A review of recent Occupational Health and Safety Committee minutes revealed that the Committee is not meeting regularly. Minutes show that historically there has been limited discussion or action on substantive matters regarding facility and operational health and safety matters.

CANCER IN THE FIRE SERVICE

Cancer related deaths and illnesses have been identified as the single most serious health threat to firefighters. The risk to firefighters of developing certain types of cancers is significantly elevated when compared to other groups of people. The BC Workers Compensation Act has recognized that the 13 cancers identified in Table 1 can be assumed to be occupational diseases caused by the elevated risks faced by firefighters over the course of their employment.

Table 1

Item	Column 1 Occupational Disease	Column 2 Minimum Cumulative Period
1	primary leukemia	5 years
2	primary non-Hodgkin's lymphoma	20 years
3	primary site bladder cancer	15 years
4	primary site brain cancer	10 years
5	primary site colorectal cancer	20 years
6	primary site kidney cancer	20 years
7	primary site lung cancer	15 years
8	primary site testicular cancer	20 years
9	primary site ureter cancer	15 years
10	primary site esophageal cancer	25 years
11	primary site breast cancer	10 years
12	primary site prostate cancer	15 years
13	multiple myeloma	15 years

These cancers are deemed to have been caused by the repeated exposures to toxins and related stresses over the course of a firefighter's career.

All fire events will result in the generation or release of a wide array of toxic materials and compounds. Modern building contents, be it a residence or a factory, have changed dramatically in terms of the types of materials that may be found. Heavy reliance of synthetics, plastics and other modern materials, and a move away from natural woods and fibres have increased the density and relative toxicity of smoke. While there are many chemicals and compounds produced, the following chart identifies some of the more

common carcinogens found in smoke. These are based on studies completed by the International Agency for Research on Cancer (IARC), an agency of the World Health Organization;

IARC Group 1 Agents (known to cause cancer in humans)	IARC Group 2A Agents (probable human carcinogens)
Arsenic	Creosote
Asbestos	Polychlorinated biphenyls
Benzene	
Benzo(a)pyrene	
1,3-butadiene	
Diesel engine exhaust	
Formaldehyde	
Soot	
Dioxin	

It is important to note that the exposure of firefighters to diesel exhaust is almost exclusively because of contamination of quarters from the exhaust emissions of their vehicles. Older fire stations lack effective controls on the management of their diesel engine exhausts. The development of mitigation strategies is essential in managing this cancer risk.

The cancer concern in fire fighters has been most effectively documented in career firefighters. All the major studies have focussed solely on career fire services. There are significant challenges in terms of physical and health monitoring of volunteer firefighters. Volunteer fire departments represent an extreme diversity of types and are frequently only loosely affiliated with a government body, making it difficult to study large groups over the necessary timelines to draw a complete understanding of the linkages between occupational exposures and cancer and other health outcomes.

What is clear, however, is that volunteer firefighters who are called upon to provide municipal structural firefighting services in their community are exposed to the same products of combustion as their career counterparts. Their exposure frequency can be similar to that of the career exposure frequency due to the volunteer attendance at a

higher percentage of serious calls than a career firefighter working a specific shift might attend. For this reason, most jurisdictions have included volunteers in their presumptive cancer legislation.

Medical monitoring of firefighters must form part of the exposure management plan for the department. Early identification of exposures, cumulative or acute, is essential to successful outcomes. NFPA 1500 provides guidance to medical practitioners on the criteria that should form part of a routine medical evaluation for firefighters. The Town should consider making mandatory medicals for firefighters, at least once every two years, part of their exposure management plan.

EXPOSURE ROUTES

Chemical and biological exposure routes include ingestions, inhalation and absorption. This is important in terms of planning for both PPE and decontamination procedures. While ingestion may be an exposure route, this is generally managed through a well applied infection and hygiene control plan. New trends in the fire service are Cancer Prevention strategies which include a holistic approach promoting healthy eating habits, exercise, adequate sleep and recovery time. Prevention methods include the use of saunas in fire halls so fire fighters can "sweat" toxins out of their pores as a cleansing method.

Of more concern to the fire service are inhalation, absorption and secondary exposures.

INHALATION:

Inhalation hazards are well understood by the Fire Service. Significant advances in respiratory protection devices, both supplied air and filtration systems have effectively managed inhalation injuries. Inhalation exposures are generally restricted to a failure to utilize the appropriate respiratory protection, frequently during the overhaul phases of an event or in outdoor areas where periodic contamination is present. It is essential that a rigorous respiratory protection policy is developed, implemented and enforced based on a risk assessment of all potential exposures.

ABSORPTION:

Firefighter protective clothing does little to protect against chemical infiltration of the protective ensemble. Many of the carcinogenic materials contained in smoke are easily absorbed through the skin. Recent studies indicate that a temperature increase of as little as 5 degrees will increase the absorption of toxic chemicals by 400%. This requires a reassessment of fire suppression tactics and development of effective decontamination procedures. Decontamination must start on scene and continue back at the fire station with careful cleaning of equipment, clothing and personnel.

Exposure reduction strategies should be considered that include tactical decisions to reduce exposures of firefighters to the hazards. Implementation of command considerations that includes the evaluation of potential contamination by products such as asbestos should be implemented. Buildings built before 1990 are likely to contain asbestos. If this is the case, decontamination practices should reflect that on site, with both the contaminated crew and the decontamination personnel being properly protected from contamination. Industry best practices dictate that cleaning and decontamination begins at the scene and that contaminated gear does not get transported inside apparatus.

EFFECTS OF HEAT:

Elevated heat exposure has been shown to increase the absorption of chemicals by as much as 400% for every 5 degrees increase in temperature inside the firefighter protective clothing. Strategies to reduce the combined exposure of firefighters to toxic smoke and chemicals and high heat need to be explored.

Transitional fire attack strategy is one that sees the controlled application of water prior to entry to lower the temperature of the fire compartment and begin fire control. Combined with effective ventilation procedures, including positive pressure ventilation, exposure to toxic chemicals and smoke is significantly reduced. This attack profile has been evaluated by Underwriters Laboratories (UL) in the United States and has been shown to provide a host of positive outcomes including reduction in flashover risk, faster management of the fire, significant cooling of the fire compartment for both potential victims and firefighters and a reduction in the overall time spent in overhaul and extinguishment.

SECONDARY EXPOSURES:

Secondary contamination is an ongoing and serious concern for all fire services. Contamination from fire and rescue sites are transported back to quarters and in some cases to home through contaminated clothing, equipment and vehicles. Transportation of contaminated gear and equipment inside the passenger compartments of firefighting vehicles, failure to clean gear and equipment properly and failure to effectively implement personal hygiene and decontamination protocols are leading causes of secondary contamination.

NFPA 1500 provides detailed guidance on processes that should be implemented in terms of managing secondary exposure risks.

EXHAUST CONTAMINATION OF FIRE STATION

The current fire station is not equipped with a vehicle exhaust management system. The BC OHS regulation 5.72 establishes a best practice for exhausting vehicle emissions to the outdoors, *wherever* possible. Where it is not possible to do so, the vehicle must be

properly maintained to minimize exhaust emissions and indoor air monitoring must be provided to ensure that worker exposures do not exceed maximum exposure thresholds.

The negative impacts of diesel exhaust contamination can be further managed by placing administrative and operational controls in place. Engines should only be operated for the minimum time required to pull out of the station. The engine should be run at the minimum throttle level required to move it and the overhead doors should be opened prior to engine start.

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) provides an important layer of protection from the effects of fire and its products. In terms of protection, research has demonstrated that personal protective gear in and of itself is not sufficient to fully protect firefighters from exposures to chemicals, including those entrained in smoke.

Section 7.1.3 of NFPA 1500 stipulates that “Structural fire-fighting and proximity fire-fighting protective ensembles and ensemble elements shall be cleaned as specified in NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles”.

NFPA 1851 provides detailed guidance on the safe storage, cleaning, maintenance and replacement of firefighter protective clothing. These requirements are also specified by manufacturers in their use and care instructions. Consideration of a separate space or enclosed, vented storage units that protect the gear from secondary contamination from station sources as well as protecting it from ultraviolet degradation should be implemented in the current and any future facility designs.

Specific PPE should be provided to protect those personnel assigned to cleanup and decontamination processes. This includes respiratory, eye and skin protection measures.

Contaminated protective clothing should not be permitted inside crew compartments of fire department apparatus. It should be given a preliminary cleaning on scene and bagged for transport to the station for proper cleaning and maintenance. Where this becomes unavoidable due to rehabilitation needs, the vehicle should be taken out of service and properly decontaminated before returning to active duty.

Civilian tours of the operational areas should be carefully considered, in terms of their potential exposure to toxic chemicals. If gear and helmets are to be placed on civilians, these should be non-operational gear that has been properly decontaminated.

OCCUPATIONAL HEALTH AND SAFETY REGULATION SECTION 5.54 EXPOSURE CONTROL PLAN

OHS Regulation, Part 5 Chemical Agents and Biological Agents, provides a detailed approach to managing exposures of workers to both biohazards such as blood and body fluids and exposures to chemicals. While the Part is principally developed to deal with a more traditional workplace, it clearly provides a supportable approach to managing firefighter exposure risks, both on the fire ground and in station. The technical aspects of firefighting are captured through application of a variety of industry standards and practices, including equipment and PPE manufacturers recommendations.

Section 5.54 discusses the elements of an exposure control plan meant to effectively address workplace exposures to chemicals. It lays out a seven-element plan that includes:

- a statement of purpose and responsibilities;
- risk identification, assessment and control;
- education and training;
- written work procedures, when required;
- hygiene facilities and decontamination procedures, when required;
- health monitoring, when required;
- Documentation, when required.

The plan should describe the roles and responsibilities of each member of the team including firefighters, officers and management.

If adopted, the recommendations contained in this report will outline the program needed to address these required elements of an exposure management plan for the Creston Fire Department.

Exhibits:

1. Exhibit 1: WorkSafeBC Part 31 Firefighting
2. Exhibit 2: WorkSafeBC Occupational Health and Safety Regulation G-5.54-3
Exposure Control Plan
3. Exhibit 3: WorkSafeBC Workplace Exposure Limits Table
4. Exhibit 4: Firefighter Gear Cleaning- PBI Performance Products
5. Exhibit 4b: Firefighter Gear Cleaning- Globe
6. Exhibit 5: Transitional Fire Attack Article (Underwriters Laboratory)
7. Exhibit 6: NIOSH Cancer Study
8. Exhibit 7: DRAFT Exhaust Management Standard Operating Guideline (Pasadena
Fire Department)
9. Exhibit 8: Fire Fighters Physicals Guide
10. Exhibit 9: Firefighter Turnout Gear SOG (Surrey Fire Department)
11. Exhibit 10: IARC Diesel Exhaust Finding Report
12. Exhibit 11: On Scene Decontamination SOG
13. Exhibit 12: Standard Firefighter Carcinogen Exposure Statement (International
Association of Fire Fighters)
14. Exhibit 13: Decontamination Skills Guide (Louisiana State University)

RESOURCES:

<https://firefightercancersupport.org/>

This is a resource for fire professionals and for those who are responsible for the operations of fire departments. It provides a wide range of leading practice information on fire fighting related cancers and connects them with information on how to reduce the issues.

<https://www.worksafebc.com>

WorkSafeBC provides a wide array of information on how to comply with provincial legislation and how to make all British Columbia worksites safe. Firefighting is covered under provincial OHS legislation.

<https://ulfirefightersafety.org/>

UL Firefighter Safety Research Institute (FSRI) advances fire research knowledge and develops cutting edge, practical fire service education aimed at helping firefighters stay safe while more effectively protecting people and property.

<https://www.nist.gov/el/fire-research-division-73300/firegov-fire-service>

Fire.gov is a collection of resources from the Engineering Laboratory's Fire Research Division at NIST. These Web pages provide links to fire related software, experimental fire data and mpeg/quick time movies of fire tests that can be downloaded and/or viewed with a Web browser.

<https://www.usfa.fema.gov/>

Contains recommended approaches to manage organizational, operational and community risk.

<https://www.nfpa.org/>

Internationally recognized leader in the provision of fire and safety related information and standards.

<https://www.iafc.org/>

The International Association of Fire Chiefs provides a forum to evaluate and share information with fire departments across the world. It is an excellent resource for shared learnings.

<https://www.ppe101.com/>

A website provided by FireRescue1 (manufacturer of Globe, MSA, etc.) that addresses training and information regarding personal protective equipment.



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