Presented To:	Emergency Services Committee
Presented:	Monday, Feb 06, 2017
Report Date	Friday, Jan 20, 2017
Type:	Correspondence for Information Only

For Information Only

Fire Services: Fire Response, Medical Tiered, Hazardous Materials, and Technical Rescue Response

Resolution

For Information Only

Finance Implications

This report has no financial implications.

Purpose

The attached report provides an overview of the services provided by the Greater Sudbury Fire Service and to describe how those services align with the risks that exist in the community. As part of the Fire and Paramedic Optimization Project, Fire Services has been analyzing the effectiveness of its current service in alignment with risks that exist in the community. In alliance with the legislative framework of the Province, Paramedic Services has been engaging in a continuous improvement plan since 2000; and thus, their services are not included in this report.

Signed By

Report Prepared By
Darrel McAloney
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Digitally Signed Jan 20, 17

Recommended by the Department
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Fire & Paramedic Services Optimization Project Update

RE: Greater Sudbury Fire Services Current Service Levels Report —February, 2017

Prepared by: Darrel McAloney, Deputy Fire Chief

Background

As staff continue their analysis for the Fire and Paramedic Services Optimization Project, they have assessed the performance of our current delivery model and firefighter skills against several key fire industry benchmarks which are also used to determine an optimized model. One of the most crucial is a Community Risk Analysis and an assessment of the effectiveness of Greater Sudbury Fire Services (GSFS) in responding to these identified risks, based on several 'industry best practice' parameters and related legislation and regulations. This report focuses on the Fire Service Risk Analysis, for the four major response service types provided by the Greater Sudbury Fire Services: Fire Protection, Technical Rescue, Hazardous Material Response (HAZMat), and Medical Tiered Response (MTR).

It is understood that Fire Services offers protection to the community in the forms of Fire Education, Fire Prevention, and Fire Incident Response. What is less well known is that Fire Services offers additional protection in the community as directed by Council, in the form of Technical Rescue (such as auto extrication, water and ice rescue, rope rescue, confined space rescue, and trench rescue), Hazardous Material Response (HAZMat), and Medical Tiered Response (MTR). For all of the services offered except Medical Tiered Response, the Greater Sudbury Fire Service is the 'service of last resort' in that there is no other agency capable of offering these services, and there is no adjacent community capable to assist in the response. The Optimization Project has, as one of it guiding principles, the need to align the community risk profile with the services required to protect them. The community risk profile, in conjunction with the City of Greater Sudbury's Hazard Identification and Risk Assessment (HIRA) Report (Appendix A) and the Fire Underwriter's Survey (FUS) Report (Appendix B), has identified the residential, commercial and industrial areas of the City with the highest risk of potential emergency incidents. It has also identified that the services currently provided are not in place to mitigate these identified risks; and further, that they are not provided in a consistent manner across the City.

Fire Suppression Response

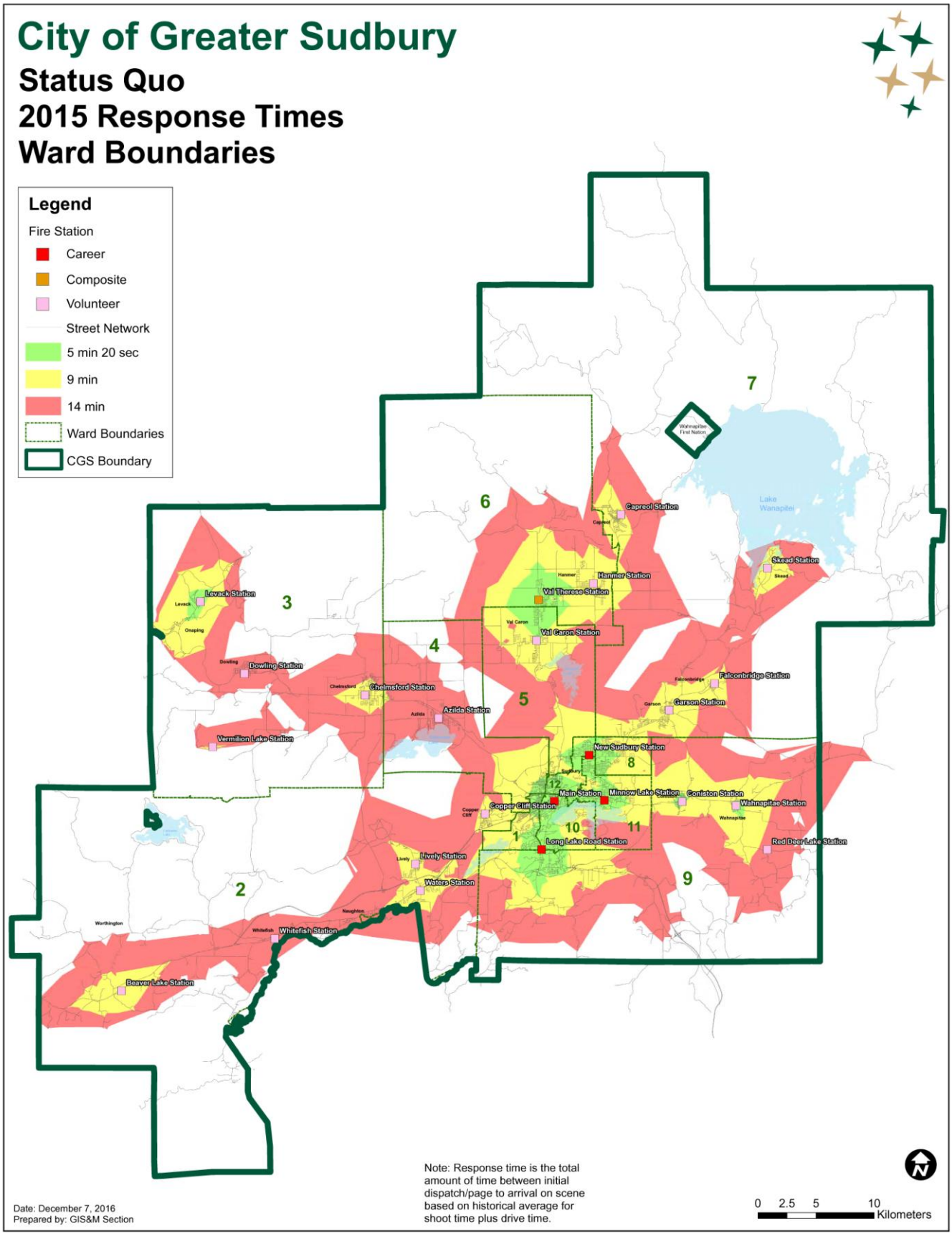
As per the Establishing and Regulating By-law 2014-84, the GSFS currently attempts to deliver fire suppression services across the City in a consistent fashion, in that the entire City is provided both offensive and defensive fire response. Offensive fire response includes interior fire rescue and attack, while defensive fire response is exterior only, with additional consideration for exposure protection (adjacent buildings and vegetation). In 2016, GSFS responded to 4,508 incidents of which 501 were fire calls, and of those 254 were considered structure fires; therefore, these incidents are frequent and the consequences, if not mitigated quickly, are significant.

While GSFS commits to offering this service consistently throughout the City, the actual delivery of the service is heavily dependent upon fire ground staffing levels, and effective response time to establish an initial firefighting complement of four firefighters and an effective firefighting complement of 14 firefighters. Interior fire attack and rescue for incidents with no risk of collapse or entrapment can begin with four firefighters, with a confirmed knowledge of additional resources en route. In the event that a fire

is more advanced, and where there is a risk of collapse or entrapment, interior fire rescue and suppression cannot occur until 14 firefighters are on scene. These requirements are enforced by the Ministry of Labour as governed by the Occupational Health and Safety Act requiring the fire service by way of the Section 21 Guidance Notes, and are based on the National Fire Protection Association (NFPA) 1710 and 1720 Response Standards. While these standards are not adopted by GSFS and are not enforceable in the Province, they are considered 'best practice' and are considered as so by the Ministry of Labour, the Fire Underwriter's Survey (FUS) and thus the insurance industry. The recommended response criteria in the NFPA Standards are; five minutes and twenty seconds (5:20) for urban areas, nine minutes (9:00) for suburban areas, and 14 minutes (14:00) for rural areas. All of these times include a 'chute' or assembly time, which is the time from notification (dispatch for career and pager notification for volunteer) until the fire truck leaves the station. In career response areas, this time is recommended to be one minute and 20 seconds (1:20). There is no defined time in a volunteer area. The average assembly time for GSFS is one minute and 34 seconds (1:34) in the career response area, and five minutes and 48 seconds (5:48) in the volunteer response area. The map below demonstrates the real-time response data for the initial truck arrival, based on the assembly times as noted above using 2015 data plus the required drive time. The green colouration identifies areas where trucks arrive within 5:20 minutes from dispatch time; yellow indicates a response time between 5:21 and 9:00 minutes; and red indicates a response time between 9:01 and 14:00. Areas outside of these colourations indicate response times longer than 14:00 minutes.

The former City of Sudbury is serviced by four career stations which operate five trucks with four responders per truck at all times. This guarantees that all responses have initial staffing of four firefighters, and that when necessary all incidents can have twenty firefighters on scene within the limitations of the response times. The Val Therese Station in the former City of Valley East is a composite station staffed by both career and volunteer firefighters. As a minimum, two firefighters on a single truck are posted at this station at all times ensuring that the first arriving vehicle will respond with that minimum number of firefighters. This response area is dependent upon volunteer firefighter response to augment the guaranteed response for both the initial response (minimum of four firefighters) and the effective response (minimum of 14 firefighters). This volunteer response is not guaranteed and response times of volunteer fire fighters vary and can result in a delay of the assembly time and overall fire ground staffing. As well, it can affect the ability for firefighters on scene from being able to respond as a minimum of four firefighters are required in order to perform rescue and attack activities. The remainder of the City relies entirely on volunteer firefighters for initial truck response. When a call is placed, volunteer firefighters are paged to report to the fire station for assembly and deployment with a fire truck. There is currently no minimum number of volunteers identified to respond to incidents of any type; and therefore, the initial truck may arrive with a single firefighter, or a full complement of four, to any given incident. This can result in a significantly delayed response of the initial four firefighter response and the effective 14 firefighter large incident response.

Map 1


City of Greater Sudbury
Status Quo
2015 Response Times
Ward Boundaries
Legend
Fire Station
Career
Composite
Volunteer
Street Network
5 min 20 sec
9 min
14 min
Ward Boundaries
CGS Boundary
Capreol Station
Hanmer Station
Val Therese Station
Val Caron Station
Levack Station
Dowling Station
Chelmsford Station
Azilda Station
Vermilion Lake Station
Skead Station
Falconbridge Station
Garson Station
New Sudbury Station
Main Station
Minnow Lake Station
Copper Cliff Station
Confederation Station
Wahnapitae Station
Long Lake Road Station
Red Deer Lake Station
Lively Station
Waters Station
Whitefish Station
Beaver Lake Station
Lake Wanapitei
Wahnapitae First Nation
1
2
3
4
5
6
7
8
9
10
11
12
Note: Response time is the total amount of time between initial dispatch/page to arrival on scene based on historical average for shoot time plus drive time.
Date: December 7, 2016
Prepared by: GIS&M Section
0 2.5 5 10
Kilometers

Protecting our Properties, Investments and Employment

The Municipal Property Assessment Corporation (MPAC) annually determines the assessed value of all properties in the City of Greater Sudbury as a base value for the establishment of the municipal taxation. The mission of the GSFS is to protect these properties and the investment they represent. Therefore, an analysis of the MPAC value protected by the GSFS within the time criteria recommended by the NFPA is a direct measure of the efficiency of the service level provided to residents, businesses and industry in the city. An analysis of the data used to create Map 1 above has been used to generate Table 1 below, which identifies the MPAC valuation of properties currently protected by the career, composite and volunteer levels of response by the GSFS. In total, the City of Greater Sudbury has an MPAC valuation of nearly $18.5 billion. The GSFS is able to respond within 5:20 minutes to about 42% of the MPAC valuation (approximately $8.4 billion). An additional 27% (approximately $5 billion) can be responded to within the 5:21 – 9:00 minute and a further 25% (approximately $4 million) in the 9:01 – 14:00 minute response time. Combined with the map, this demonstrates that fire protection meets industry best practices within the City core (former City of Sudbury); however, the response in the outlying areas requires improvement.

Table 1 – Service Coverage

Fire Response Times	< 5:20 NFPA 1710		5:21 - 9:00 NFPA 1720		9:01 - 14:00 NFPA 1720		Coverage beyond 14 minutes		Total Coverage	
	% properties covered	$ Assessed Value	% properties covered	$ Assessed Value	% properties covered	$ Assessed Value	% properties covered	$ Assessed Value	% properties covered	$ Assessed Value
Status Quo										
Career	35%	$ 7,487,885,102	48%	$ 10,428,084,362	61%	$ 12,711,406,862	61%	$ 12,711,406,862	61%	$ 12,711,406,862
Composite	5%	$ 849,823,700	12%	$ 1,902,127,367	15%	$ 2,287,603,567	15%	$ 2,287,603,567	15%	$ 2,287,603,567
Volunteer	1%	$ 85,491,900	9%	$ 1,165,800,400	18%	$ 2,487,824,800	18%	$ 2,487,824,800	18%	$ 2,487,824,800
Beyond 14 minutes	0%	$ -	0%	$ -	0%	$ -	6%	$ 936,422,600	6%	$ 936,422,600
Total	**42%**	**$ 8,423,200,702**	**69%**	**$ 13,496,012,129**	**94%**	**$ 17,486,835,229**	**100%**	**$ 18,423,257,829**	**100%**	**$ 18,423,257,829**

Note: Service level expectations are based on NFPA Standard 1720 – *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments,* which is applied for both composite and volunteer departments.

Fire Prevention and Education

The GSFS currently has six Fire Prevention Officers, who perform request inspections, complaint inspections, and annual inspections on Vulnerable Occupancies such as retirement and long-term care facilities. In 2016, Fire Prevention Officers conducted 1,085 inspections and reviewed 537 building permits along with 27 site plans specific to Ontario Fire Code compliance. The Fire Underwriter's Survey (FUS) in 2016 reviewed the operation of the GSFS and identified Fire Code enforcement as an area that has significant opportunity for improvement. FUS ratings are provided to insurance companies who use these ratings to set insurance premiums for residential and commercial properties. FUS recommends scheduled inspection of high risk occupancies should include regular visits to theatres, clubs, churches, hotels, restaurants, schools, jails, apartment buildings, gas stations,

warehouses, paint booths, and a variety of retail occupancies. Currently, the GSFS does not schedule or perform any annual inspections on these types of commercial, industrial, or high occupancy residential properties. The GSFS has one Public Safety Officer who is tasked with providing targeted fire safety education programs to the most vulnerable members of the population: school-aged children and the elderly. In Greater Sudbury, there are 84 schools and 190 registered Vulnerable Occupancies (i.e. retirement/long-term care facilities, and care and treatment occupancies). The table below shows the current ability to respond to these facilities within five and nine minutes.

Table 2 – Vulnerable Occupants

# of vulnerable properties by Medical Tiered Response (MTR)

		MTR			
Category	**Area**	**5 min**	**9 min**		**Total**
# of Schools	Core	36	10	0	**46**
	Levack	1	0	0	**1**
	Val Therese	3	12	0	**15**
	Capreol	0	1	0	**1**
	Outside	0	0	21	**21**
	Total	**40**	**23**	**21**	**84**
# of Senior Homes	Core	28	2	0	**30**
	Levack	1	0	0	**1**
	Val Therese	0	5	0	**5**
	Capreol	0	2	0	**2**
	Outside	0	0	13	**13**
	Total	**29**	**9**	**13**	**51**
# of Hospitals	Core	1	0	0	**1**
# of Daycares	Core	41	6	0	**47**
	Levack	1	0	0	**1**
	Val Therese	3	8	0	**11**
	Capreol	0	1	0	**1**
	Outside	0	0	19	**19**
	Total	**45**	**15**	**19**	**79**
# of Correctional Institutions	Core	1	1	0	**2**
	Total	**1**	**1**	**1**	**2**
# of Care and Treatment Occupancies and Retirement Homes	Core	37	8	0	**45**
	Val Therese	2	3	0	**5**
	Outside	0	0	7	**7**
	Total	**39**	**11**	**7**	**57**

NOTE: This is data utilized and maintained by the City's GIS Section. Though every effort is made to keep the data current, accurate and complete, we cannot guarantee its reliability.

Prepared by the GIS&M Section, City of Greater Sudbury, January 17, 2017

The 2011 Census shows that Greater Sudbury has 72,418 dwellings and a population of 160,269. Table 3 shows the current ability GSFS has to respond within five and nine minutes.

Table 3 – Dwellings and Population

Dwellings #	MTR			
Area	5 min	9 min		Total
Core	30,339	11,535	-	41,874
Levack	487	430	-	917
Val Therese	2,888	4,883	-	7,771
Capreol	-	1,418	-	1,418
Outside	-	-	20,438	20,438
Total	**33,714**	**18,266**	**20,438**	**72,418**

Population #	MTR			
Area	5 min	9 min		Total
Core	58,942	26,419	-	85,361
Levack	1,036	1,006	-	2,042
Val Therese	8,218	12,380	-	20,598
Capreol	-	3,276	-	3,276
Outside	-	-	48,992	48,992
Total	**68,196**	**43,081**	**48,992**	**160,269**

SOURCE: 2011 Census of Canada, Statistics Canada

Prepared by the Community and Strategic Planning Section, City of Greater Sudbury, January 17, 2017

Technical Rescue

As per the Establishing and Regulating By-law 2014-84, the GSFS currently offers technical rescue services of auto extrication, water and ice rescue, and low-angle rope rescue. The frequency of these type incidents varies from frequent (auto extrication) to somewhat infrequent (ice rescue), but the consequence of these incidents when serious, is high as these incidents are almost always life threatening if not responded to quickly with strategically located staff and equipment.

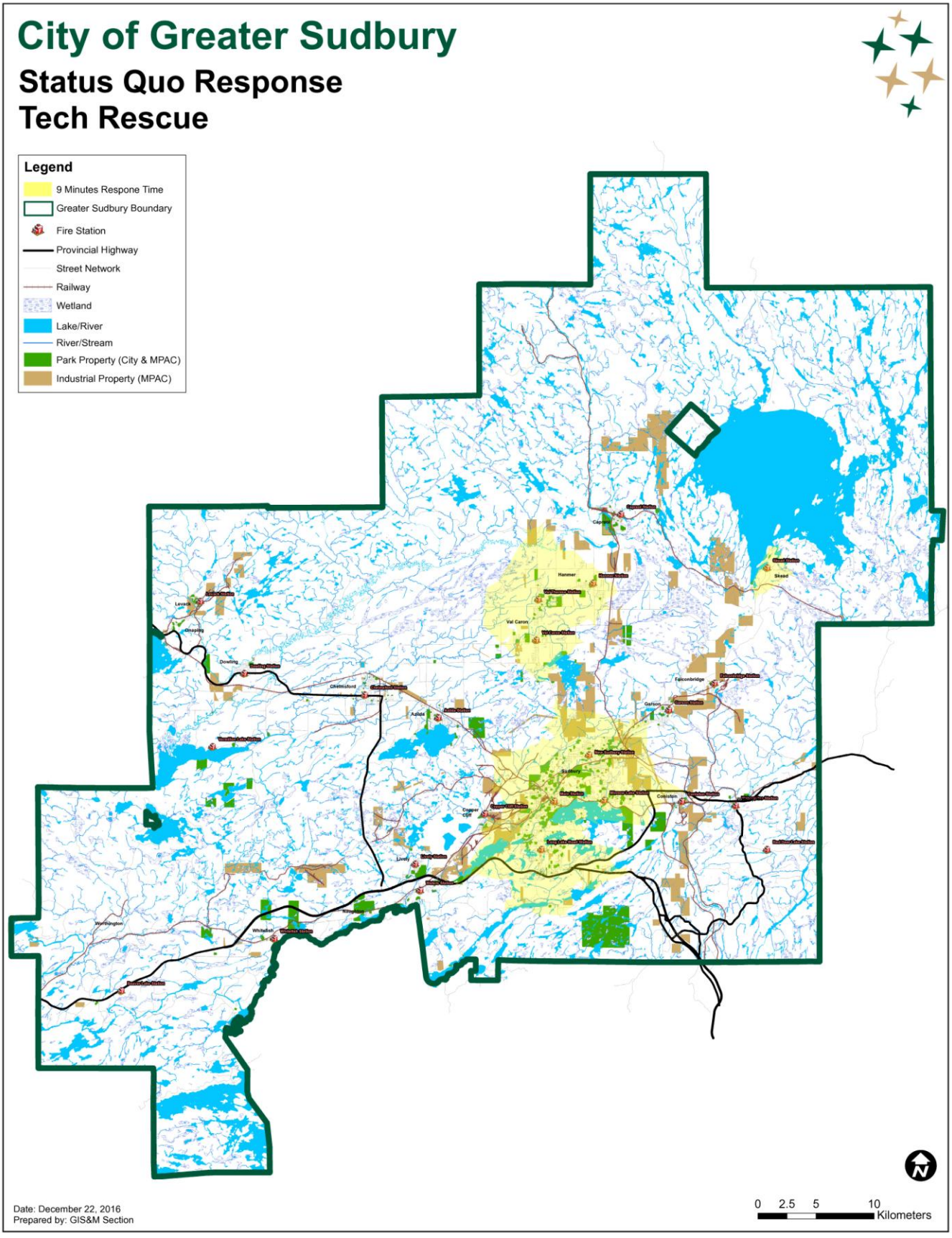
Auto extrication is offered from 13 fire stations (a mix of career, composite, and volunteer stations) which are situated closest to the risk in the community (i.e. main roadways and major provincial highways). The only compromise to consistent service delivery across the City is related to the

response time spectrum from the various stations as noted above. The response time polygon for the City is identified by Map 1 (above) for auto extrication.

Low angle rope rescue consists of assisting patient extrication using rope, where the majority of the load is not supported by the rope (i.e. rescuing an unconscious person being carried on a stretcher on a hillside). Due to the geography and topography of the City, this risk and the service to address it, are offered through the community where the same response time limitations exist.

Water and ice technical rescue is provided by all career stations, the Val Therese composite station, and volunteer stations in Azilda and Skead at an enhanced level. These types of rescue are offered across the City at an awareness level – shore-based rescue, from the remaining stations. Given that Greater Sudbury is known as the City of Lakes, and contains more lakes than any other municipality in Canada; 330 freshwater lakes over 10 hectares in size, these levels of service do not align with the risks associated in our community. Lake Wanapitei is the largest city-contained lake in the world at 13,257 hectares and Ramsey Lake is the second largest. In 2009, approximately 7,000 people or 4% of the City's population lived on a lake and many others have camps and cottages on our City's lakes. The response capability of the GSFS for water and ice technical rescue is identified on Map 2 below. Once again, the response time is based upon 2015 data for average assembly time, plus the required drive time. The yellow polygons on Map 2 indicate a nine minute response time for water and ice technical rescue based on response from those stations which have trained firefighters for this type of rescue. The intense concentration of blue (water) on this map demonstrates the vast network of lakes and rivers which are spread across the entire City of Greater Sudbury. The map also shows industrial properties, railways, major highways and utility rights of way, further reinforcing that the service level offered to the community for all technical rescue does not align with the distribution of risk.

Map 2


City of Greater Sudbury
Status Quo Response
Tech Rescue
Legend
9 Minutes Respone Time
Greater Sudbury Boundary
Fire Station
Provincial Highway
Street Network
Railway
Wetland
Lake/River
River/Stream
Park Property (City & MPAC)
Industrial Property (MPAC)
Date: December 22, 2016
Prepared by: GIS&M Section
0 2.5 5 10
Kilometers

The GSFS is currently researching in cooperation with Water/Wastewater Services, the implementation of confined space and trench rescue responses which have been identified as a need under the Occupational Health and Safety Act, Regulation 632/05, Confined Space. The risk profile for trench rescue and confined space rescue focuses on the roadways and right-of-ways used for utility delivery, and other industrial properties spread throughout the City, as identified on Map 2. These services are not currently offered by the GSFS; however, a Budget Enhancement was approved by Council for the 2017 Budget to implement this service. Due to the training commitment associated with these evolutions, delivery of these services will be limited to career firefighters at the present time.

It is important to note that the GSFS is the only agency in the City which offers these technical rescue services to the community. There are some agencies that provide stand-by services but do not offer rescue services.

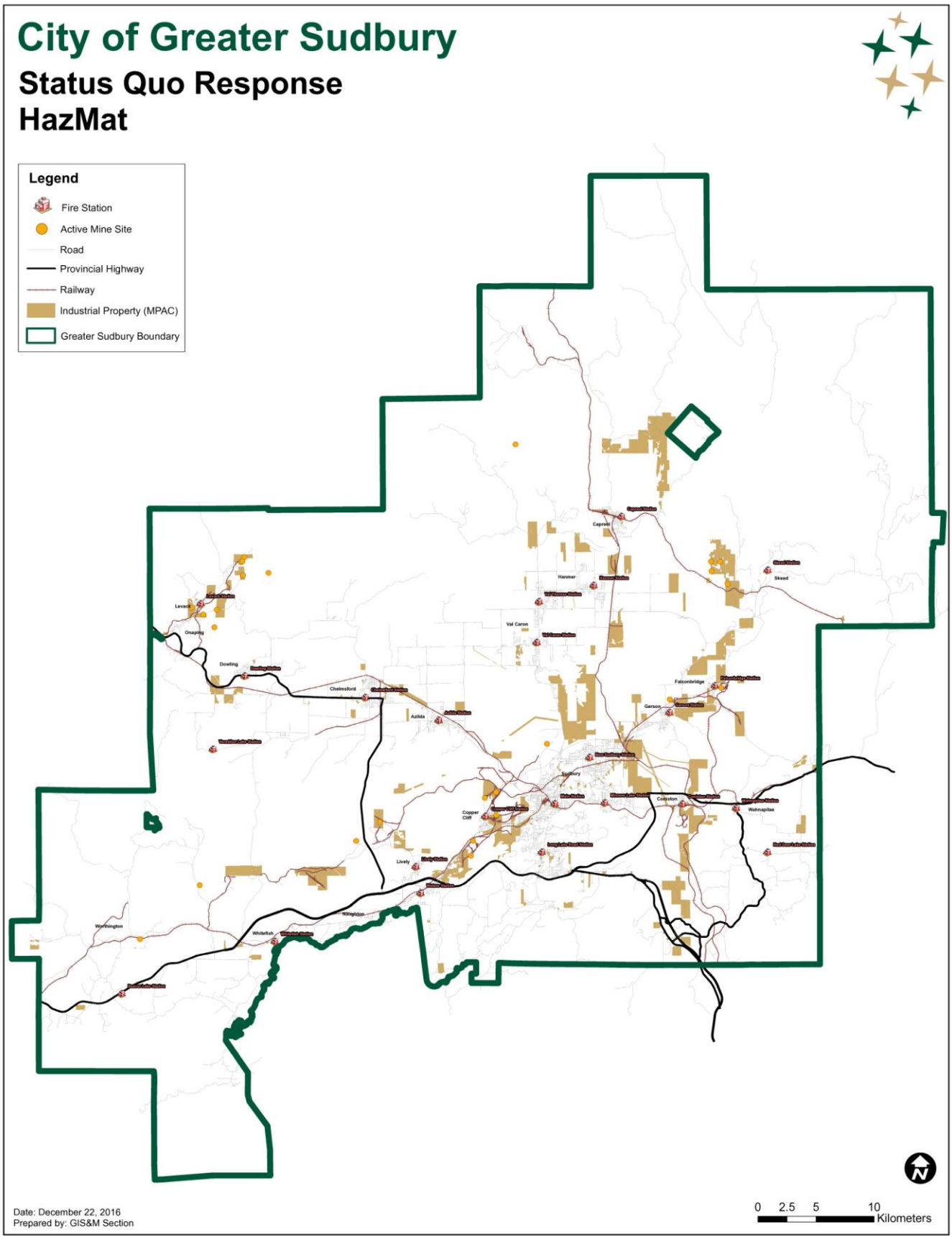
Hazardous Materials (HAZMat) Response

As per the Establishing and Regulating By-law 2014-84, the GSFS currently offers HAZMat response at the lowest level, Awareness, throughout the City. The By-law identifies that the GSFS offers decontamination line services to agencies which may respond in order to mitigate any incidents in the City. HAZMat training has only been provided to career firefighters. The City's Hazard Identification and Risk Assessment (HIRA) has identified these incidents as the highest risk incidents which could cause an emergency to be declared for the community as a whole. The frequency of these types of incidents varies from frequent small spills to somewhat infrequent large spills and transportation emergencies; however, the consequence of these incidents, when serious, is extremely high, and these incidents may be life threatening to entire neighbourhoods. Further, these incidents can have serious community-wide impact to the infrastructure, environment, economy, and reputation of the City of Greater Sudbury.

The City's HIRA has also identified that the level of service provided by the GSFS is low and does not align with the identified risk in the community. Greater Sudbury has significant industrialization related primarily to the mining, milling and smelting of base metals which is the backbone of the local economy. Large quantities of chemicals for industrial manufacturing and processing are delivered into, out of and through the City by way of the three high volume railways and three major highway corridors, including the TransCanada Highway. For example, in the first half of 2016 about 10,000 railcars (or 1.25 million barrels) of crude, oil and gas passed through Greater Sudbury just by rail alone. Road transportation companies are not required to report to municipalities the type or volumes of hazardous materials that are shipped through/around our City. Over the past three years, Greater Sudbury has had two train derailments and at least three major derailments have occurred just outside the City. Further, Transport Canada had identified that the Greater Sudbury area has nine of the top 500 highest risk railway crossings in Canada.

In Greater Sudbury, there are 733 industrial businesses which represent approximately 452 businesses per 100,000 of population. For comparison, the City of Ottawa has 236 industrial businesses per 100,000 and the City of Toronto has 446 per 100,000. Greater Sudbury currently has an awareness level for HAZMat response, whereas Ottawa and Toronto have lower concentration of industrial businesses, but have a higher level of response (Technician Level). Given the high volume of industrial and mining activity in the City, it is no surprise that significant quantities of hazardous materials are stored in warehouses around the City, and are then shipped throughout for use in various the manufacturing and industrial facilities. This further increases the risk of hazardous material spills in our community which we must be prepared to respond. On a positive note, we have some indication of the location and concentration of these facilities in our community (i.e. mine sites, industrial parks, warehouses, etc). These risk areas are identified on Map 3 shown below. It is important to note that GSFS responds to these risks at the awareness level, which would constitute scene security (i.e. barricades) and requesting assistance from Ottawa or Toronto Fire Services. As noted above, Ottawa and Toronto have technician level response, which indicates their active involvement in mitigation. In Greater Sudbury, mitigation, clean up, and remediation would be lead by agencies located outside of the City and the GSFS would be available for support only.

Map 3

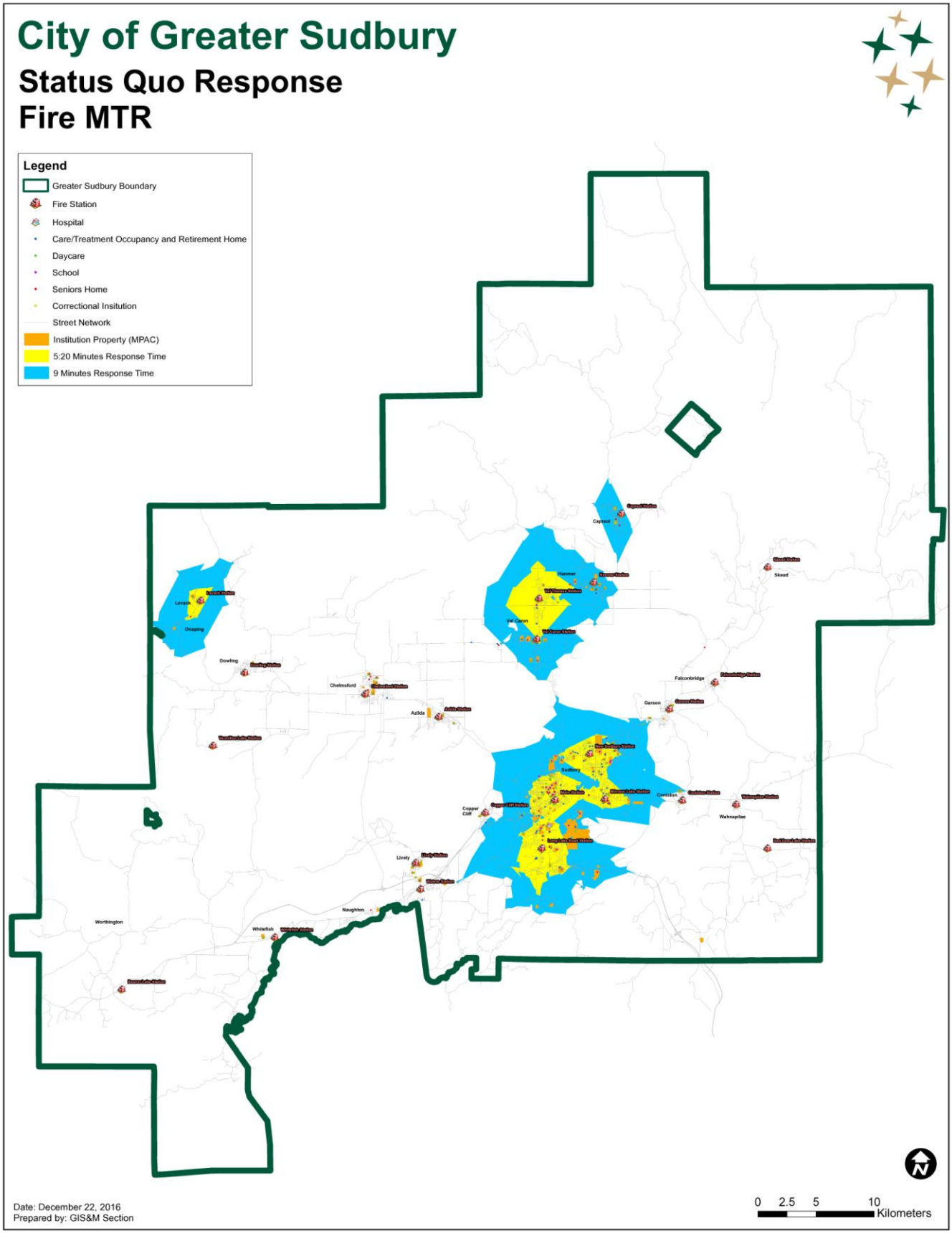

City of Greater Sudbury
Status Quo Response
HazMat
Legend
Fire Station
Active Mine Site
Road
Provincial Highway
Railway
Industrial Property (MPAC)
Greater Sudbury Boundary
Capreol
Hanmer
Val Caron
Skead
Levack
Onaping
Dowling
Chelmsford
Azilda
Falconbridge
Garson
Sudbury
Copper Cliff
Coniston
Wahnapitae
Lively
Worthington
Whitefish
Date: December 22, 2016
Prepared by: GIS&M Section
0 2.5 5 10
Kilometers

Medical Tiered Response (MTR)

As per the Establishing and Regulating By-law 2014-84, the GSFS currently offers Medical Tiered Response (MTR) at the Emergency First Responder level. This means that firefighters would provide basic first aid, cardiopulmonary resuscitation (CPR), rapid application of automated external defibrillator (AED) when paramedics are not immediately available and only until their arrival. MTR is currently provided by City core career stations, the Val Therese composite station, and the Capreol, Dowling and Levack volunteer stations. All of the remaining stations do not offer this type of response. In 2015, GSFS responded to almost 800 calls for medical assistance, or 18% of the total call volume. The frequency of these types of incidents is significant, and the consequence is high as the MTR Agreement outlines that the GSFS response is limited to incidents that are almost always life threatening if not responded to immediately. The GSFS offers this service as a support service to Greater Sudbury Paramedic Services, and they are not the primary agency for medical responses. The GSFS represents a depth of service for medical response to the areas of the City where it is offered and is not a means to replace paramedics.

Map 4 indicates the response polygon for MTR as well as the location of occupancies which generate the highest frequency of incidents. The yellow polygons indicate a 5:20 or less response time and the blue polygons indicate a 5:21 – 9:00 minute response time from those stations which have been trained for MTR. It is noted that there are significant community risks such as schools, daycare centers, and old age/senior care facilities in the former towns of Rayside Balfour, Walden and Nickel Center which are not currently being protected by GSFS medical tiered response. It is important to recognize that the Greater Sudbury Paramedic Service is the primary response agency for these incidents and that they do offer a consistent level of service throughout the City, including an ambulance located in each of the identified communities. GSPS medical tiered response provides primary coverage when an area's ambulance is responding to an incident and an additional ambulance is on route to backfill the coverage.

Map 4


City of Greater Sudbury
Status Quo Response
Fire MTR
Legend
Greater Sudbury Boundary
Fire Station
Hospital
Care/Treatment Occupancy and Retirement Home
Daycare
School
Seniors Home
Correctional Insitution
Street Network
Institution Property (MPAC)
5:20 Minutes Response Time
9 Minutes Response Time
Capreol
Hanmer
Val Caron
Skead
Levack
Onaping
Dowling
Chelmsford
Azilda
Falconbridge
Garson
Sudbury
Coniston
Wahnapitae
Copper Cliff
Lively
Naughton
Whitefish
Worthington
Date: December 22, 2016
Prepared by: GIS&M Section
0 2.5 5 10
Kilometers

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CITY OF GREATER SUDBURY

Hazard Identification and Risk Assessment

This document is available in accessible formats upon request.

Revised December 2012

INTRODUCTION

Since September 11, 2001, the Government of Ontario has increased its capabilities and responsibilities in Emergency Management for the Province. The *Emergency Management and Civil Protection Act* changed how municipalities create and maintain their emergency plans. It has also changed the municipal focus on "Emergency Measures" (being preparedness and response) to "Emergency Management" (mitigation, prevention, preparedness, response, and recovery).

PURPOSE

The purpose of this document is to identify the hazards, which have caused, or possess the potential to cause, disastrous situations by overwhelming response capabilities within the City of Greater Sudbury. This information will aid our Emergency Management Section and Emergency Services Department to prepare for more effective emergency responses and operations. The planning phase will seek to mitigate the effects of a hazard, prepare for response measures and ensure the safety of our citizens, preserve life, and minimize damage.

MISSION STATEMENT

The City of Greater Sudbury, Emergency Services Department's mission is to ensure that our municipality is prepared to respond to and recover from all natural, technological and man-made emergencies by providing leadership and support through a risk-based Emergency Management Program of mitigation, prevention, preparedness, response and recovery.

Through Emergency Management, our long-term vision is to co-ordinate and support effective management, training and education to reduce the risks to citizen health, safety, security and property. The key reason for an Emergency Management Program is to support the creation of a disaster-resilient community. A realistic risk-based program properly resourced and exercised will save lives and money.

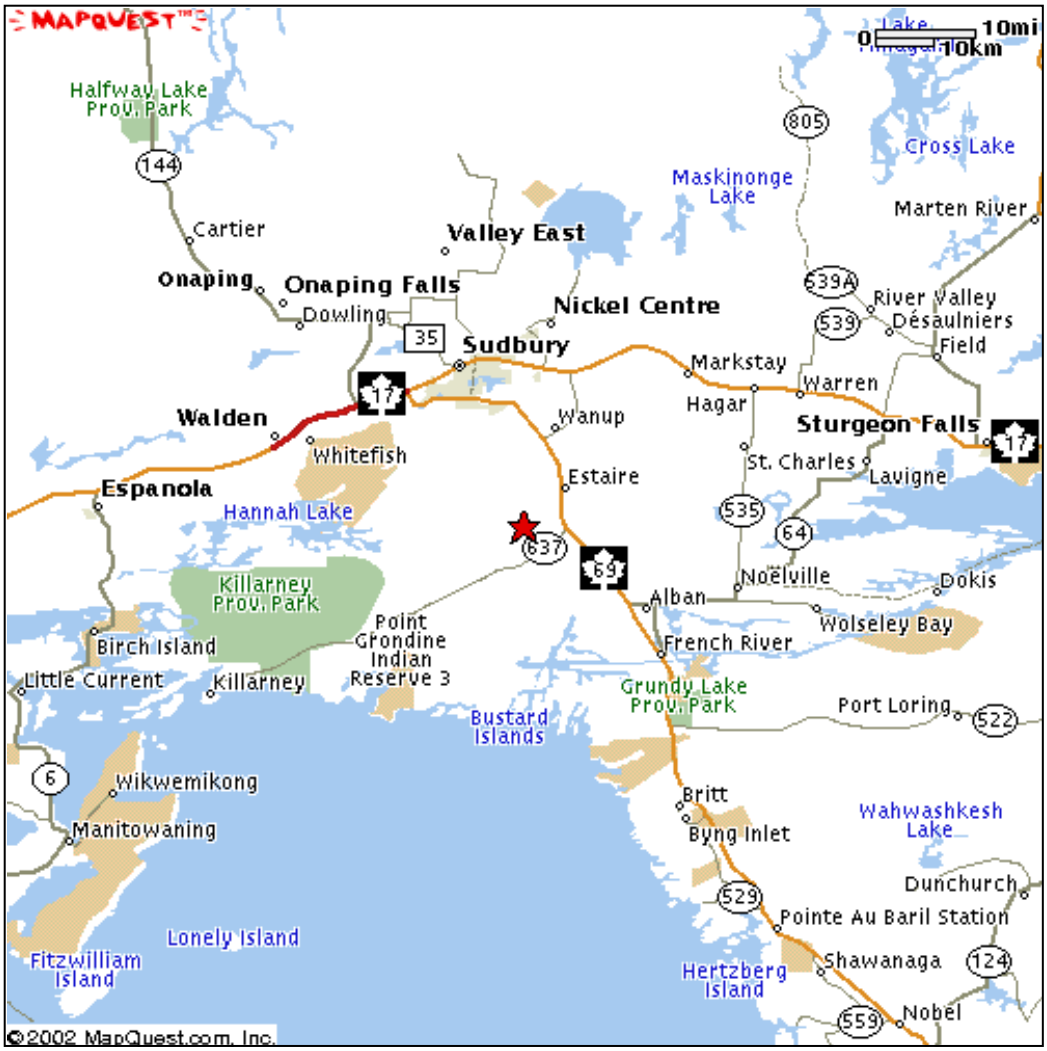
SITUATION

The City of Greater Sudbury is nestled on the southern edge of the "Sudbury Basin" in Northern Ontario (see Figure One). The City sits on the Trans-Canada Highway, connecting Western Canada to Toronto, Ottawa, and other points east of Ontario. Greater Sudbury can be reached by ground via Highways 17, 69 and 144, as well as by train and airplane. Also important to note, is that Sudbury is considered a train "hub", connecting rail lines across Ontario as well as Canada.

Sudbury is surrounded by a number of urban centres, both small and large including:

- Timmins, located 275km North of Sudbury
- Ottawa, located 450km East of Sudbury
- Toronto, located 400km South of Sudbury
- Sault Ste. Marie, located 300km West of Sudbury.

Figure One: City of Greater Sudbury Location Map



POPULATION

It is estimated that 160,274 people live within the 3,627 km^2 area that makes up the City of Greater Sudbury[1]. A breakdown of the City's population by community can be found in Figure Two[1]. The majority of the population resides in the City core located generally in the area formerly known as the City of Sudbury. This area includes the Donovan, Floor Mill, Kingsmount, Downtown, Bell Park, Minnow Lake, New Sudbury, South End and West End. The remainder of the City's population resides in small urban communities separated by rural development and undeveloped land.

Figure Two: Population by Area

Area	Population
Azilda	3,837
Capreol	3,276
Chelmsford	6,570
Coniston	2,149
Copper Cliff	2,604
Dill, Cleland and Dryden	1,080
Donovan, Flour Mill	14,370
Dowling	2,069
Falconbridge	683
Garson	6,492
Hanmer	5,945
Kingsmount - Downtown - Bell Park	6,820
Levack and Onaping	1,948
Lively	4,792
Minnow Lake	10,124
Naughton	758
New Sudbury	24,329
Northeast Townships	43

[1] 2011 Census of Canada

South End	21,686
Val Caron (Blezard Valley/McCrea Heights)	6,335
Val Therese	7,851
Wahnapitae	1,349
West End	8,415
Remaining areas of CGS	16,749

ECONOMY

The City of Greater Sudbury is perceived to be predominantly a mining-based community. The 2006 census lists retail trade as the largest portion of the labour force in Greater Sudbury at 12.6% followed by health care and social assistance at 12.2%. The mining sector comes in third at 7%. The average family income in Greater Sudbury is $81,721, with median family income of $68,411[2].

HIRA WORKING COMMITTEE

The process undertaken to produce the original report involved significant time and effort on the part of the City's Working Committee, which was chaired by the Director of Emergency Medical Services. This Committee, representing City services (Emergency Management, Public Health, EMS, Fire Services and Police), the local hospital, and hydro, met regularly, both as a committee and within sub-committees, to determine the hazards most likely to affect the City as a whole. Currently the report is reviewed by Greater Sudbury's Community Emergency Management Coordinator and circulated to City departments and partner agencies for comment before publication. A sample form used by the City is included as Appendix 2.

HOW DEGREE OF RISK IS MEASURED

Emergency Management Ontario (EMO) provides a template for communities to use for measuring risk based on probability and consequence. The City of Greater Sudbury Emergency Services Department expanded these to include frequency (how often has the event happened in the past) and response capability. The City of Greater Sudbury is one of the larger urban centres in Ontario that does **not** have an urban neighbor within one hour of travel time. Recognizing that external resources are not immediately available, response capability becomes a variable that must be considered when prioritizing risk in the community.

The HIRA (Hazard Identification and Risk Assessment) Committee used a number of factors when evaluating each risk. Though a number of methods were considered, the

[2] Statistics Canada 2006 Census

final product evaluated risks based on frequency, probability, consequences and response capabilities. Each of these factors was assigned a ranking and upon completion, all four factors were combined to provide an overall score out of a possible 15 marks. These risks were then placed in priority order based on their score. A high score indicated an item that was of high risk to the community, whereas a low score indicated an item that was a low risk to the community. Further details with regards to evaluating HIRA are offered below.

1. Frequency: Ranking from 1 (low occurrence) to 4 (high occurrence)

When evaluating each risk's occurrence in the Sudbury area, a great deal of statistical data was used to determine if an event had occurred in the past. Once this data was collected, each risk was ranked based on time factors, such as 5 years, 5-15 years, etc. High marks were assigned to those events that had taken place in the past five years, while low marks were assigned to those events that had never taken place in the Sudbury area.

2. Probability: Ranking from 1 (unlikely) to 3 (likely)

When evaluating each risk's probability of occurrence, a great deal of research was performed and a number of organizations offered their professional opinions. For example, when researching any natural disasters, Environment Canada was able to provide a number of statistical observations specific to the Sudbury area dating back nearly 30 years. Once an event's probability statistics were reviewed, it was deemed either as a likely, possible or unlikely event to occur in the Sudbury area.

3. Consequences: Ranking from 1 (negligible) to 4 (high)

To determine the potential consequences of each risk, research was performed into the type of damage associated with each risk and professional opinions were sought. Once all research was collected, consequences were ranked by severity, ranging from insignificant damage (damage that is too small to consider) to severe damage (damage including fatalities and loss of essential services).

4. Response Capabilities: Ranking from 1 (excellent) to 4 (poor)

The final component to the HIRA involved analyzing the City's ability to respond to each type of risk. There are many factors that influence the City's response capability including equipment, personnel, communications, technical support, training, experience and contingency plans. The ability of outside agencies to respond to events was also examined. Rankings for this category were placed in reverse order with high marks being assigned to emergencies where the City would have difficulty responding, making these events a higher risk to the community.

THE RANKING SCALE

Each hazard has been scored based on the following scale:

Frequency

1 – Negligible	No history of incidents in the Sudbury area
2 – Low	More than 15 years since last event
3 – Medium	5 - 15 years since last incident
4 – High	Event(s) in the last 5 years

Probability

1 – Unlikely	Has not occurred and unlikely to occur in the future
2 – Possible	Could occur in the future
3 – Likely	Has occurred and will occur again in the future

Consequences

1 – Negligible	Too small or unimportant to be worth considering
2 – Limited	Some injuries, minor/localized
3 – Substantial	Widespread injuries/damage, basic services out
4 – High	Fatalities, severe damage, essential services out

Response Capabilities

1 – Excellent	Ability to respond using only internal resources
2 – Good	Ability to respond using mainly internal resources and a small number of external resources
3 – Fair	Ability to respond using mainly external resources and a small number of internal resources
4 – Poor	Ability to respond using only external resources

SUMMARY OF FINDINGS

The following summary shows a ranked listing of the top hazards for the City of Greater Sudbury emphasizing those hazards that require specific attention in the Emergency Management Program (i.e.: response plans, training/exercises public awareness, etc.).

Event	Ranking
Hazardous Materials Incident – Fixed Site	15
Hazardous Materials Incident – Transportation	15
Human Health Emergencies and Epidemics	15
Tornados	14
Energy Emergencies – Hydro	12

Note: *A ranked listing of all City of Greater Sudbury hazards is located in Appendix 1.*

CATEGORIES OF HAZARDS

The Emergency Management Program divides hazards into three main categories: Natural, Technological and Human-Caused.

1. Natural Hazards

Natural hazards are emergencies that result from the forces of nature. The following natural hazards have been identified and assessed for the City of Greater Sudbury:

• human health emergencies	• extreme heat
• floods	• blizzard
• fires (forest, wildland, urban interface)	• fog
• extreme cold	• agriculture and food emergencies
• ice/sleet storms	• hailstorms
• tornadoes	• hurricanes
• windstorms	• earthquakes
• lightning and thunder storms	• drought

Human Health Emergency and Epidemic

WestNile Virus

Over the past few years, there have been a number of health related events that have taken place, though they are not officially classified as epidemics. From October 2003 to March 2004, the Public Health Unit declared an outbreak of Influenza A. During this same period of time, a cluster of meningitis cases where identified in the Valley East area. It was later determined that these cases were unrelated.

The Sudbury & District Health Unit began documenting cases of West Nile Virus in 2006. West Nile virus is an illness that spreads from mosquitoes to humans. The mosquito is capable of spreading the virus to people and animals while biting for a blood meal. The virus is not spread from person to person, and cannot be spread directly from infected animals, such as birds, horses or pets to people.

Documented Cases of Positive WestNile Virus[3]			
Year	**Birds**	**Mosquito Groups**	**Human**
2012	0	2	0
2011	0	0	0
2010	0	0	0
2009	0	0	0
2008	2	0	0
2007	2	0	0
2006	8	12	1

Blue-Green Algal Blooms

2012 saw the continued trend of multiple reports of Blue-Green Algal in area lakes that resulted in the closure of public beaches and Drinking Water Advisories. Ramsey Lake, which is a major source of drinking water for the residents of the City of Greater Sudbury, was one of those lakes affected. (source: Sudbury & District Health Unit)

Blue Green Algal Blooms can have an adverse effect on the City's source of drinking water. They are unsightly and may be toxic if ingested by wildlife, livestock or humans. Photosynthetic bacterium or cyanobacterium (generally known as blue-green algae) is commonly found in small numbers in lakes, ponds and wetlands. While it is normally invisible to the casual observer, it increases dramatically when conditions are favourable (most often during hot, calm weather) and the algae are often seen as blue-green in colour, resembling thick pea soup. Although blooms occur naturally, water bodies which have been enriched with plant nutrients from municipal, industrial and agricultural sources are particularly susceptible.

[3] Sudbury and District Health Unit

H1N1 Pandemic

On June 11, 2009, the World Health Organization (WHO) declared a "Level 6 pandemic". A "Level 6 pandemic" is declared when there is increased and sustained transmission of a virus in the general population. H1N1 (swine flu) first appeared in Mexico in mid March and spread to more than 208 countries including Canada. The vast majority of confirmed H1N1 cases had mild Influenza-Like Illness (ILI) and recovered in 3 to 5 days. The Sudbury & District Health Unit confirmed the first case of H1N1 in Greater Sudbury on May 4th, 2009.

Number of Confirmed H1N1Cases in Greater Sudbury	
Wave 2 - Fall 2009	72
Wave 1 – Spring summer 2009	23

These numbers confirmed that H1N1 influenza (flu) was spreading in our community. Laboratory samples are generally only collected from patients who are at high risk of complications due to influenza infection. Laboratory samples are not collected from every person with influenza-like illness who seeks medical care. Therefore, the numbers in the table only confirm that H1N1 influenza was present in our community. They do not paint the full picture of the level of activity (how many people were infected with influenza overall). (Source: Sudbury & District Health Unit)

The potential consequences of any of these human health emergencies are high and may include fatalities, the quick spread of disease in urban areas, and the strain of health care resources. The City's ability to respond to these threats would be poor as we would have to rely on external resources.

Flood

Flooding is defined as the filling or covering with water or other fluid, overflow, inundation, or the filling of anything to excess. Over the years, a number of overland floods have occurred in the Sudbury area with the most recent flooding occurring in 2002. The consequences have been limited to minor injuries and localized damage. The City's response capabilities for flood response remain fair, having to rely mainly on external resources and a small number of internal resources.

On July 26th, 2009 a massive rainstorm that was concentrated on a small area of Greater Sudbury (downtown area) dumped between 75 to 100 millimeters of rain in a two hour period. The rainstorm resulted in urban flooding that overwhelmed the drainage systems and caused significant property damage in localized areas. Flooded basements and sewer backups were the most common reported damage. There was no significant damage to municipal critical infrastructure.

On September 22nd & 23rd, 2010 Greater Sudbury received 75 mm of rain in a 30 hour period. As a result we experienced some minor localized flooding across Greater Sudbury.

Fire (Forest and Wildland/Urban Interface)
It has been between five and fifteen years since the last major forest or wildland fire occurred in Greater Sudbury, making the probability of one occurring now relatively low. However, the possibility is increasing due to larger amounts of forest fire fuels and climate change issues. The damage associated with such an event is expected to be limited to minor injuries and localized damage given the City's response capability.

Forest/Wildland Fires in Greater Sudbury[4]	
Year (as of Oct 31)	**Number of Fires** (bush, brush, forest)
2012	226
2011	301
2010	364
2009	17
2008	97
2007	179
2006	311
2005	341

Extreme Cold
Extreme cold is characterized by temperatures falling to -30ºC or less. From 1990 to 2002, Environment Canada recorded that an average of 2.4 days fell below these temperatures each year in the City of Greater Sudbury. Given our northern location, the City's ability to respond to these events is high.

Recorded Days with -30ºC Temperatures[5]	
Year (as of Oct 31)	**Number of Days** (-30ºC or less)
2012	0
2011	1
2010	0
2009	3
2008	0
2007	1
2006	0
2005	2

[4] Sudbury Fire Services Database
[5] Environment Canada

Ice/Sleet Storm

On average, there have been approximately 18 days of ice/sleet storms in the City of Greater Sudbury, with December and January being the months with the most freezing rain days recorded. The consequences of this type of event are high and include fatalities, severe damage and the loss of essential services. The City's ability to respond to such an event is fair, having to rely mainly on external resources and a small number of internal resources.

Tornado

A tornado is defined as a rotating column of air ranging in width from a few yards to more than a mile and whirling at destructively high speeds, usually accompanied by a funnel-shaped downward extension of a cumulonimbus cloud. On May 26, 2008, a tornado touched down on the water at Windy Lake Provincial Park. Environment Canada later confirmed this tornado was rated F0 (no damage). Though it had been more than fifteen years since the last tornado in the Sudbury area, there remains a probability of its re-occurrence. A tornado has a number of consequences including fatalities, severe damage and the loss of essential services. The City's ability to respond to such an event is fair, having to rely mainly on external resources. A number of critical infrastructures are at risk during a tornado including buildings, roads, utilities and rail lines.

Windstorm

A windstorm is a storm that is characterized by high winds or violent gusts, with little to no rain. Over the years, multiple windstorms have occurred in the Sudbury area however, physical injuries were minimal and damage to the City was localized. Windstorms are likely to occur again in the future and although the City has been fortunate in the past, these storms do have the potential for creating significant damage. The City's response capabilities for this type of emergency remain good, as we are able to respond using mainly internal resources, and a small number of external resources. Our main critical infrastructures at risk during such an event include utilities and roads and rail lines, which can easily become obstructed by fallen debris and substantial wind gusts.

Lightning and Thunderstorm

There has been an average of 22 thunderstorm days over a 30-year period (1971–2000) in the Greater Sudbury area. On July 17th, 2006, a line of severe thunderstorms with very strong winds passed through the city. This event, called a "DERECHO", produced wide spread damage to infrastructure and private property and resulted in power outages to hundreds of residents for up to 6 days. Prior to this date, the City had only experienced minor, localized damage due to thunderstorms. If a large scale storm were to occur, the City's ability to respond with internal resources would be quite good, requiring limited external resources and support.

Extreme Heat

Extreme heat is defined as a maximum temperature reaching or exceeding 30ºC and the Humidex reaching or exceeding 40ºC. Between 1990 and 2002, Environment Canada recorded an annual average of 5.8 days reaching or exceeding these temperatures in the City of Greater Sudbury. The City's ability to respond to extreme heat conditions with internal resources is good.

Recorded Days with 30ºC Temperature and 40ºC Humidex[6]	
Year	**Number of Days**
2012	8
2011	6
2010	13
2009	1
2008	0
2007	6
2006	9
2005	20

Blizzards

Violent snowstorms are typically called blizzards. Blizzards are generally defined by a period of six or more hours with winds above 40 km/h with visibility reduced to below 1km by blowing and drifting snow. Over a 49-year period (1954-2002) the Sudbury Airport has recorded an annual average of 1.9 days with daily snowfall exceeding 115cm. The consequences as a result of these types of storms are limited and the City's ability to respond to such events is excellent.

Fog

Between 1971 and 2000, Environment Canada recorded an annual average of 67 days with at least one hour of fog in the City of Greater Sudbury. The City has never experienced a fog incident that has resulted in any damage and as such, the probability of a damaging fog event occurring is quite low. However, should thick fog occur, the City's ability to respond to resulting vehicle accidents would be fair.

Agriculture and Food Emergency

If an agricultural or food emergency were to occur in the City of Greater Sudbury, the consequences would be substantial, as we would lose our essential food supply. The City's ability to respond to such an emergency is fair though we would have to rely mainly on external resources. Our main concern would be the environmental impact on local land, as well as the resulting supply shortage to food banks and private homes. This type of event has never occurred and it is very unlikely that it will in the future.

[6] Environment Canada

Hailstorm

Hail is a precipitation consisting of ice pellets with a diameter of 5 millimetres or more. The probability of a hailstorm occurring in the Sudbury area is quite low, however if such an event should occur, the consequences could include injuries and minor or localized damage.

Hurricane

Greater Sudbury has never experienced a hurricane and the probability of one occurring is low. However, in the event that a hurricane does occur, the consequences could include injuries and minor or localized damage and the City's response capability would depend mainly on external resources.

Earthquake

In the past five years, there have been four earthquakes recorded in Greater Sudbury by the Geological Survey Commission of Canada. Though there was no damage from any of these events, we must recognize the consequences involved, which could include injuries and minor or localized damage. The City's ability to respond to such an event is fair, having to rely mainly on external resources and a small number of internal resources. A number of critical infrastructures would be at risk during an earthquake including buildings, roads, utilities and rail lines.

Earthquakes Recorded in Greater Sudbury[7]	
Year	**Magnitude**
2012	0
2011	0
2010	0
2009	0
2008	0
2007	0
2006 (Nov 29)	4.1
2005 (Mar 13)	3.6
2005 (Sept 21)	2.9

Note:

- On August 23rd,2011, Greater Sudbury residents felt some minor shaking as a result of an earthquake in Charlottesville Virginia, USA measuring 5.9 on the Richter scale.
- On June 23rd, 2010, a magnitude 5.0 earthquake hit central Canada. Although Greater Sudbury residents felt some minor shaking the epicentre of the quake was in Val-des-Bois, Quebec.

[7] Geological Survey Commission of Canada

Drought
Drought can be defined as a prolonged period of abnormally dry weather producing a moisture shortage that affects crops and forests, and reduces water resources to a degree, that creates serious environmental, economic or social problems. It has been more than fifteen years since the last severe drought in the Sudbury area and as such, the possibility of its occurrence is unlikely. The anticipated damage associated with a drought in Greater Sudbury would be small. However, if a large scale drought were to occur, the City's ability to respond is rated as fair.

2. Technological Hazards

Technological hazards are emergencies that result from the manufacture, transportation, and use of technology or certain substances. The following technological hazards have been identified and assessed for the City of Greater Sudbury:

• hazardous materials: chemical release	• other mass casualty incidents
• hazardous materials: transport incident	• critical infrastructure failure: water
• air accident: passenger, offsite, rural	• critical infrastructure failure: bridge
• air accident: passenger, offsite, residential	• critical infrastructure failure: hospital
• air accident: passenger, onsite	• transportation accident: passenger (road and rail)
• energy emergency: hydro	• nuclear facility emergency
• explosion / fire	• dam failure
• mine emergency	• petroleum / gas pipeline emergency

Hazardous Materials: Chemical Release (breaches confines of facility)
Greater Sudbury has experienced hazardous material releases into the atmosphere on five occasions in the last five years. Though these were minor events, it is likely to re-occur due to the types of industries present in this community. These types of events are difficult to control and impossible to contain since the chemicals tend to follow the direction of the wind. The consequences from such an emergency could be substantial and may include widespread injuries/damage and the loss of essential services. There is also a great risk for negative environmental impact as well as damage to critical infrastructure. The City's ability to respond to such an event remains poor as we would need to call outside sources such as the Ministry of the Environment and CHEMTREC.

(See table below)

Hazardous Materials: Fixed Site	
2012	no incidents
2011	no incidents
2010 – July 1	sulphuric acid
2010 – January 22	sulphur
2009 – June 1	Oleum (Sulphur Trioxide)
2008 – October 9	chlorine
2006 – August 3	ammonia

Hazardous Materials: Transport Incident
On July 7th, 2011, a truck carrying chlorine caught fire on the southwest bypass. Fortunately Greater Sudbury Fires Services were able to contain the fire quickly and it did not result in a threat to public safety. In 2004, an accident involving a transport truck carry hazardous material caused minor injuries and localized damage. However, this type of event could happen again in the Sudbury area due to the number of major highways running through the city. Our ability to respond to such an event remains poor as we would need to call outside sources such as the Ministry of the Environment and CHEMTREC.

Air Accident: Passenger, Offsite, Rural
The City of Greater Sudbury has one airport that is serviced by Air Canada, Bearskin Airlines and Porter Airlines.

Though a commercial passenger aircraft has never crashed in a rural area of Sudbury, private aircrafts have. Given the large number of flights that pass through the area on a daily basis, there remains the possibility of this type of event occurring at both the commercial and private level. If this type of event did occur, the consequences would be limited to some injuries and localized damage and our ability to respond is fair. The major concern with a rural, offsite crash is the ability of the rescue team to locate and access the fallen aircraft.

Air Accident: Passenger, Offsite, Residential
Though there has never been a passenger aircraft that has crashed in a residential area of the City of Greater Sudbury, this type of event cannot be ignored due to its substantial consequences. These consequences could include widespread injuries and damage, as well as the loss of basic services. The City's ability to respond to such an incident is fair having to rely mainly on external resources.

Air Accident: Passenger, Onsite
Though a passenger aircraft has never crashed at the Sudbury airport, we cannot ignore the possibility. The consequences associated with such an event are limited to some injuries and localized damage. The City's ability to respond to such an event is good as we are able to respond with mainly internal resources and limited external support.

Energy Emergency: Hydro
Though there is no power generating station in Greater Sudbury, the possibility of a power related event occurring remains a concern. On July 17, 2006, hydro infrastructure was severely damaged due to a severe windstorm leaving hundreds of residents without power for up to 6 days. In August of 2003, the City of Greater Sudbury experienced the province wide substantial power failure which resulted in a 19-hour blackout for most residents. On January 17th, 2011, a power outage affected over 7600 customers which lasted over six (6) hours. The temperature on that date was -12 degrees Celsius. An energy emergency occurring during the winter months is more severe and could result in a number of consequences including fatalities, severe damage and the loss of essential services. Even though the City has experienced this type of emergency, the ability to generate power locally does not exist. Our ability to respond with internal resources to such an event remains good.

Explosion/Fire
An emergency involving an explosion or fire has not occurred in the Sudbury area in the past 5 to 15 years. However, the consequences involved with this type of situation are high, resulting in the possibility of fatalities, severe damage and the loss of essential services. The City's ability to respond to this situation is fair having to rely mainly on external resources. It is important to note that severe environmental impacts could occur as a result of an explosion, as well as damage to critical infrastructure within the City.

Mine Emergencies
As one of the world's leaders in mining, the consequences of a mining emergency are limited, resulting in the possibility of injuries and minor localized damage. However, this type of event is likely to happen in the City of Greater Sudbury as it has in the past. Our ability to respond to such an incident is fair having to rely mainly on external resources and a small number of internal resources.

Other Mass Casualty Incidents
A Mass Casualty Incident is defined as any single occurrence that overwhelms local resources. Mutual Aid agreements with surrounding authorities would ensure that first response agencies such as Police, Fire, and EMS receive adequate assistance within a reasonable time period. The local hospital would be overwhelmed with the number of injured, particularly if the incident involved biological, chemical, or radiological agents. The City's ability to respond to this type of emergency would be fair having to rely mainly on external resources.

Critical Infrastructure Failure: Water
The consequences that would result from a water emergency are high and include fatalities, severe damage and the loss of essential services. Furthermore, the City's ability to respond to such an event remains fair having to rely mainly on external resources to manage the situation. A large environmental impact to ground, air and water could be expected if the water emergency involved contamination.

Critical Infrastructure Failure: Bridge
On May 7, 2004, a bridge under construction collapsed, blocking a major arterial road in the city. The consequences that could result from a bridge collapse are limited to a localized area. The City's ability to respond with internal resources to such an event is good.

Critical Infrastructure Failure: Hospital
On June 6, 2007, Sudbury Regional Hospital, St Joseph's site, sustained minimal fire damage as a result of an electrical fire in the lower level of the building. The hospital was taken off the hydro grid and ran on auxiliary generator power for several hours. The Emergency Room was relocated to the Memorial site and a number of patients were transferred to other facilities. Eight hours later the generator failed and the full scale evacuation of patients began. When power was restored hours later, the evacuation of patients ceased. Though this incident resulted in minor damage to the building and only a partial evacuation of patients this type of event cannot be ignored. The consequences of a loss of hospital beds to the community are significant. The City's ability to respond with internal resources to the fire is good; however our ability to replace hospital beds in the community is poor and would require assistance from external resources.

Transportation Accident: Passenger (Road and Rail)
Though it has been more than fifteen years since the last transportation accident that involved passengers traveling by road or rail, we cannot deny the possibility that it could occur in the future. The consequences as a result of this type of event are limited to injuries and minor or localized damage. Our ability to respond to such an event remains good having to rely mainly on internal resources and only a small number of external resources.

Nuclear Facility Emergency
There is currently no nuclear facility found within the Greater Sudbury area, making the possibility of an emergency occurring very unlikely. However, we must note the consequences involved should a nuclear facility emergency occur. These consequences could include injuries and minor, localized damage. As well, the City's ability to respond to such an event would be low, and as such we would rely heavily on external support and resources.

Dam Failure
When a dam fails or is subject to massive overtopping, huge quantities of water rush downstream with great destructive force. A dam failure has never occurred in the Sudbury area, and as such it remains unlikely. Even so, we must acknowledge the substantial consequences that could result from a dam failure including widespread injuries and/or damage and the loss of basic services. The City's ability to respond to this type of event remains good, as we are able to rely mainly on internal resources with minimal external support.

Petroleum/Gas Pipeline Emergency
Although there has never been a petroleum or gas pipeline emergency in the City of Greater Sudbury and it has been determined that it is an unlikely event to occur in the future, we must recognize the consequences. There is a possibility of injuries and minor or localized damage resulting from a petroleum or gas pipeline emergency, the City's ability to respond to such an event is good***.***

3. Human Hazards

Human hazards are emergencies that result directly from human actions. The following human hazards have been identified and assessed for the City of Greater Sudbury:

• sabotage
• terrorism
• civil disorder

Sabotage
In 2008, there was a significant rise in the number of arsons in Greater Sudbury. There were no fatalities however, property damage was significant. Property damage/loss due to arson included a warehouse, an apartment building, a restaurant and a police storefront. The United Steelworkers Hall, a Sudbury landmark, was destroyed on September 19th. The Steelworkers Hall fire posed a significant threat to the community as the building sits over a culvert that flows into the lake from which the City draws much of its drinking water. Runoff from the water used to put out the fire and the materials in the building could have contaminated the lake. Though the occurrence of sabotage events remains low, it is important to note that the consequences of such events are substantial and include widespread injuries/damage and the loss of basic services. The City's ability to respond to sabotage is fair, using mainly external resources and a small amount of internal support.

Terrorism
Though the City of Greater Sudbury has never endured a terrorist attack, given the events happening around the world we cannot ignore the possibility. The consequences that come as a result of a terrorist attack are high and can include fatalities, severe damage and the loss of essential services. The City of Greater Sudbury's ability to respond to a terrorist attack including chemical, biological, radioactive and nuclear agents is poor.

Civil Disorder

Though it has been more then fifteen years since the last occurrence within the Sudbury area, we cannot deny the possibility that civil disorder could occur in the future. The consequences involved in a civil disorder could include injuries and minor and localized damage. The City's ability to respond to such a situation is good using mainly internal resources and few external resources.

REPORT MAINTENANCE

This report is reviewed and updated annually by the staff of Emergency Management as required by the Province of Ontario, *Emergency Management and Civil Protection Act*.

Appendix 1

RANKED LISTING

Hazard	Ranking	Frequency	Probability	Consequences	Response Capabilities
NATURAL EVENTS					
Human Health Emergencies	15	4	3	4	4
Tornadoes	14	4	3	4	3
Floods	12	4	3	2	3
Fires (Forest and Wildland)	12	4	3	2	3
Lightning and Thunderstorms	12	4	3	3	2
Earthquakes	11	3	3	2	3
Ice / Sleet Storms	11	4	2	2	3
Extreme Cold	11	4	3	2	2
Extreme Heat	11	4	3	2	2
Windstorms	10	3	3	2	2
Blizzards	9	4	3	1	1
Fog	8	1	2	2	3
Agriculture and Food Emergencies	8	1	2	3	2
Hailstorms	7	1	2	2	2
Hurricane	7	1	1	2	3
Drought	7	1	2	2	2
TECHNOLOGICAL EVENTS					
Hazardous Materials – Fixed Site	15	4	3	4	4
Hazardous Materials – Transportation	15	4	3	4	4
Energy Emergency - Hydro	12	3	3	4	2

Hazard	Ranking	Frequency	Probability	Consequences	Response Capabilities
TECHNOLOGICAL EVENTS (continued)					
Critical Infrastructure - Computers	12	4	3	3	2
Explosions or Fire	12	3	2	4	3
Mine Emergencies	11	3	3	2	3
Extreme Air Pollution	11	4	2	2	3
Critical Infrastructure - Hospital	10	3	3	2	2
Other Mass Casualty Incidents	10	1	2	4	3
Critical Infrastructure – Water	10	1	2	4	3
Critical Infrastructure – Sewers	10	3	3	2	2
Infrastructure/ Bridge Collapse	9	3	2	2	2
Air Crash Offsite– Rural	9	1	2	2	4
Building Structural Collapse	9	1	2	3	3
Critical Infrastructure – Telecomms	9	1	2	3	3
Transport Accident – Passenger	8	2	2	2	2
Nuclear Facility Emergency	8	1	1	2	4
Air Crash Onsite – Airport	8	2	2	2	2
Dam Failure	8	1	2	2	3
Air Crash Offsite – Residential	7	1	2	2	2
Energy Emergency – Natural Gas	5	1	1	1	2
Petroleum / Gas Pipeline emergency	5	1	1	1	2

Hazard	Ranking	Frequency	Probability	Consequences	Response Capabilities
HUMAN EVENTS					
Sabotage	13	4	3	3	3
Civil Disorder	8	2	2	2	2
Terrorism	7	1	2	2	2

HIRA SHEET

Event:
Type:

Score

Frequency	4	High	Event(s) in the last 5 years.
	3	Medium	It has been 5-15 years since the last event.
	2	Low	It has been more than 15 years since the last event.
	1	Nil	It has never occurred in the Sudbury area.

Probability	3	Likely	Has occurred in the past and will occur again in the future.
	2	Possible	Could occur in the future.
	1	Unlikely	Has not occurred and will not in the future.

Consequence	4	High	Fatalities, severe damage, essential services out.
	3	Substantial	Widespread injuries/damage, basic services out.
	2	Limited	Some injuries, minor/localized damage.
	1	Negligible	Too small or unimportant to be worth considering.

Response Capabilities	4	Poor	Ability to respond using only external resources.
	3	Fair	Ability to respond using mainly external resources and a small number of internal resources.
	2	Good	Ability to respond using mainly internal resources and a small number of external resources.
	1	Excellent	Ability to respond using only internal resources.

Environmental Impact:

Environment	Concerns	Controlling these Concerns
Ground		
Air		
Water		

Other Concerns:

Critical Infrastructure at Risk

Population Affected:

Organizations That Can Offer Assistance:

Existing Plans:

Fire Underwriters Survey
A SERVICE TO INSURERS AND MUNICIPALITIES

c/o SCM Opta Information Intelligence

April 8th, 2016

Greater Sudbury Fire Services
239 Montee Principale, Unit 5
Azilda, ON
P0M 1B0

Attention: Trevor Bain, Fire Chief

Fire Underwriters Survey – Corporation of the City of Greater Sudbury

Fire Underwriters Survey is a national organization that represents more than 90 percent of the private sector and casualty insurers in Canada. Fire Underwriters Survey provides data to program subscribers regarding public fire protection for fire insurance statistical and underwriting evaluation.

Fire Underwriters Survey conducted an assessment for each area of the fire defenses primarily for fire insurance grading and classification purposes. The following letter provides a brief description of the grading process.

The Public Fire Protection Classification (PFPC) is a numerical grading system scaled from 1 to 10 that is used by Commercial Lines[1] insurers. Class 1 represents the highest grading possible and Class 10 represents an unrecognized level of fire protection, or fire protection beyond 5 km by road travel distance from the nearest responding fire station. The PFPC grading system evaluates the ability of a community's fire protection programs to prevent and control major fires that may occur in multi-family residential, commercial, industrial, institutional buildings, and course of construction developments.

Fire Underwriters Survey also assigns a second grade for fire protection. The second grading system, entitled Dwelling Protection Grade (DPG), assesses the protection available for small buildings such as single-family dwellings and is used by Personal Lines[2] insurers.

The DPG is a numerical grading system scaled from 1 to 5. One (1) is the highest grading possible and five (5) indicates little or no fire protection is present; Class 5 also represents fire protection beyond 8 km by road travel distance. This grading reflects the ability of a community to handle fires in small buildings such as single family dwellings and semi-detached dwellings.

We are pleased to inform that our analysis of the City of Greater Sudbury that our fire insurance classification assessment is complete. The following two tables outline past and present Public Fire Protection Classifications and the Dwelling Protection Grades attributed to the City of Greater Sudbury.

1 Commercial Lines: A distinction marking property and liability coverage written for business or entrepreneurial interests (includes institutional, industrial, multi-family residential and all buildings other than detached dwellings that are designated single-family residential or duplex) as opposed to Personal Lines.
2 Personal Lines: Insurance covering the liability and property damage exposures of private individuals and their households as opposed to Commercial Lines. Typically includes all detached dwellings that are designated single family residential or duplex.

Table 1 – Public Fire Protection Classification (PFPC) Updates for the City of Greater Sudbury

SUB DISTRICT(S) and (contract protection areas)	PFPC Previous	PFPC 2016	COMMENTS
Sudbury Fire Station 1 (H.P.A)	4	**4**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Minnow Lake Fire Station 2 (H.P.A)	4	**4**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
New Sudbury Fire Station 3 (H.P.A)	4	**4**	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Long Lake Fire Station 4 (H.P.A)	4	**4**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Copper Cliff Fire Station 5 (H.P.A)	5	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Waters Fire Station 6 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Lively Fire Station 7 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Whitefish Fire Station 8 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Beaver Lake Fire Station 9 (F.P.A)	9	**9**	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Azilda Fire Station 10 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Chelmsford Fire Station 11 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Dowling Fire Station 12 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall.
Vermillion Lake Fire Station 13 (F.P.A)	9	**9**	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Levack Fire Station 14 (H.P.A)	5	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Val Caron Fire Station 15	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Val Therese Fire Station 16 (H.P.A)	6	**4**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Hanmer Fire Station 17 (H.P.A)	6	**4**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Capreol Fire Station 18 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Garson Fire Station 20 (H.P.A)	6	**4**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Falconbridge Fire Station 21 (H.P.A)	4	**7P**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Skead Fire Station 22 (F.P.A)	9	**9**	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.

Coniston Fire Station 23 (H.P.A)	6	**6**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Wahnapitae Fire Station 24 (H.P.A)	6	**5**	Hydrant Protected – Commercial Lines insured properties within 150m of a hydrant and within 5 road km of a fire hall
Fire Hall Protected Area	9	**9**	Fire Hall Protected – Commercial Lines insured properties within 5km of a fire hall but not within 150 m of a hydrant.
Rest	10	**10**	Rest – Commercial Lines insured property beyond 5 km by road of a fire hall.

Table 2 – Dwelling Protection Grade (DPG) Updates for the City of Greater Sudbury

SUB DISTRICT(S) and (contract protection areas)	DPG Previous	DPG 2016	COMMENTS
Sudbury Fire Station 1 (H.P.A)	1	**1**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Sudbury Fire Station 1 (F.P.A)	3B	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Minnow Lake Fire Station 2 (H.P.A)	1	**1**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Minnow Lake Fire Station 2 (F.P.A)	4	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
New Sudbury Fire Station 3 (H.P.A)	1	**1**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
New Sudbury Fire Station 3 (F.P.A)	4	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Long Lake Fire Station 4 (H.P.A)	3A	**1**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Long Lake Fire Station 4 (F.P.A)	N/A	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Copper Cliff Fire Station 5 (H.P.A)	3A	**3A**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Copper Cliff Fire Station 5 (F.P.A)	N/A	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Waters Fire Station 6 (H.P.A)	N/A	**3A**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Waters Fire Station 6 (F.P.A)	N/A	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Lively Fire Station 7 (H.P.A)	3A	**3A**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Lively Fire Station 7 (F.P.A)	4	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Whitefish Fire Station 8 (H.P.A)	3A	**3A**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Whitefish Fire Station 8 (F.P.A)	3B	**3B**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Beaver Lake Fire Station 9 (F.P.A)	4	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.

Azilda Fire Station 10 (H.P.A)	2	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Azilda Fire Station 10 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Chelmsford Fire Station 11 (H.P.A)	2	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Chelmsford Fire Station 11 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Dowling Fire Station 12 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall
Dowling Fire Station 12 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Vermillion Lake Fire Station 13 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Levack Fire Station 14 (H.P.A)	2	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Levack Fire Station 14 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Val Caron Fire Station 15 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Val Caron Fire Station 15 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Val Therese Fire Station 16 (H.P.A)	2	2	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Val Therese Fire Station 16 (F.P.A)	3B	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Hanmer Fire Station 17 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Hanmer Fire Station 17 (F.P.A)	3B	3B	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Capreol Fire Station 18 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Capreol Fire Station 18 (F.P.A)	3B	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Garson Fire Station 20 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Garson Fire Station 20 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Falconbridge Fire Station 21 (H.P.A)	3A	5	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Falconbridge Fire Station 21 (F.P.A)	4	5	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Skead Fire Station 22 (F.P.A)	4	4	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Coniston Fire Station 23 (H.P.A)	3A	3A	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.

Coniston Fire Station 23 (F.P.A)	4	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Wahnapitae Fire Station 24 (H.P.A)	3A	**3A**	Hydrant Protected – Personal Lines insured properties within 300m of a Fire Hydrant and within 8 road km of a fire hall.
Wahnapitae Fire Station 24 (F.P.A)	4	**4**	Fire Hall Protected – Personal Lines insured properties within 8 km of a fire hall but not within 300m of a hydrant.
Rest	5	**5**	Unprotected – Personal Lines insured properties further than 8 km by road of a fire hall.

As indicated in the table above, there are numerous stations that have received downgrades. Stations were downgrades are present reflect deficiencies within the fire insurance grading of Greater Sudbury, as it relates to Volunteer Rosters below 15 firefighters, and apparatus with a service life of over 20 years. Supporting documentation has been provided within the Appendices of this letter to assist the community in restoring their fire insurance classifications back to previous grades, should there be interest in doing so.

Please note that this letter is private and confidential. The underlying data of this report has been developed for fire insurance grading and classification purposes. This letter may be used by the stakeholders to assist in planning the future direction of fire protection services for the City of Greater Sudbury.

Please contact our office if there are any questions or comments regarding the intent or content found throughout this letter.

Robert Aguiar
Senior Public Fire Protection Specialist
Fire Underwriters Survey

Appendix A

TECHNICAL BULLETIN

FIRE UNDERWRITERS SURVEY™

A Service to Insurers and Municipalities

FIRE UNDERWRITERS SURVEY RECOMMENDED FREQUENCY OF FIRE PREVENTION INSPECTIONS

The frequency of fire prevention inspections for all occupancies should be specifically appropriate for the level of fire risk within the occupancy. The frequency of inspections will vary from one occupancy to another depending on:

1. Type of occupancy.
2. Occupant load.
3. Function.
4. Grade of hazard

As the fire risk increases, the frequency of inspections should also be increased.

The following table is a minimum frequency guideline for major occupancy classifications from the National Building Code of Canada.

Group - Division National Building Code Occupancy	Minimum Inspection Frequency
A-1	6 months
A-2	6 months
A-3	6 months
A-4	6 months
B-1	6 months
B-2	6 months
C	6 months
D	12 months
E	12 months
F-1	3 months
F-2	6 months
F-3	6 months

Sample Customized Frequency Schedule

Group - Division National Building Code Occupancy	Inspection Frequency	*Group - Division National Building Code* Occupancy	Inspection Frequency
A-1		**C**	
Movie Theaters	6 months	Apartments	6 months
Theaters	6 months	Boarding Houses	6 months
A-2		Hotels (Unsprinklered)	2 months
Bowling Alleys	6 months	Hotels (Sprinklered)	4 months
Churches	6 months	Lodging Houses	6 months
Non-Residential Clubs	6 months	Motels	6 months
Community Halls	6 months	Residential Schools	6 months
Dance Halls	6 months	**D**	
Exhibition Halls	6 months	Banks	12 months
Gymnasiums	6 months	Barbers/Hairdressers	12 months
Libraries	6 months	Beauty Parlours	12 months
Licensed Beverage Premises (Unsprinklered)	2 months	Dental Offices	12 months
Licensed Beverage Premises (Sprinklered)	4 months	Self-Services Laundries	12 months
Museums	6 months	Medical Offices	12 months
Restaurants	6 months	Offices	12 months
Schools	4 months	Radio Stations	12 months
Daycares	6 months	Appliance Service/Rentals	12 months
Undertaker Premises	6 months	**E**	
A-3		Department Stores	12 months
Arenas	6 months	Shops	12 months
Rinks	6 months	Stores	12 months
Indoor Pools	6 months	Supermarkets	12 months
A-4		**F-1**	
Stadiums	6 months	Feed Mills	3 months
B-1		Spray Paint Booths	3 months
Jails	6 months	**F-2**	
Police Stations	6 months	Warehouses, Service Stations	12 months
B-2		**F-3**	
Children's Custodial Homes	2 months	Storage Garages, Medical Labs	12 months
Hospitals	2 months		
Nursing Homes	4months		

For further information regarding frequency of fire prevention inspections for fire insurance grading purposes, please contact a Fire Underwriters Survey office.

Appendix B

TECHNICAL BULLETIN

FIRE UNDERWRITERS SURVEY™

A Service to Insurers and Municipalities

Insurance Grading Recognition of Used or Rebuilt Fire Apparatus

The performance ability and overall acceptability of older apparatus has been debated between municipal administrations, the public fire service and many others for years. Fire Underwriters Survey (FUS) has reviewed experiences across Canada and in other countries and has developed a standard for acceptance of apparatus as the apparatus becomes less reliable with age and use.

The public fire service is unique compared to other emergency services in that fire apparatus vehicles are not continuously in use. However, when in use, the apparatus is subject to considerable mechanical stress due to the nature of its function. This stress does not normally manifest itself on the exterior of the equipment. It is effectively masked in most departments by a higher standard of aesthetic care and maintenance. Lack of replacement parts further complicates long term use of apparatus. Truck and pump manufacturers maintain a parts inventory for each model year for a finite time. After that period, obtaining necessary parts may be difficult. This parts shortage is particularly acute with fire apparatus due to the narrow market for these devices.

Fire Underwriters Survey lengthy experience in evaluating fire apparatus indicates that apparatus should be designed to an acceptable standard. The standard that is accepted throughout Canada by Fire Underwriters Survey is the Underwriters' Laboratories of Canada (ULC) Standard S515 (most updated version) titled, "Automobile Fire Fighting Apparatus," which was adopted as a National Standard of Canada in September 2004. Alternatively, NFPA 1901, the Standard for Automotive Fire Apparatus (most updated version) is also accepted by Fire Underwriters Survey with respect to apparatus design. Fire apparatus should be built by recognized manufacturers and tested by a suitably accredited third party.

Fire apparatus should respond to first alarms for the first fifteen years of service. During this period it has reasonably been shown that apparatus effectively responds and performs as designed without failure at least 95% of the time. For the next five years, it should be held in reserve status for use at major fires or used as a temporary replacement for out-of-service first line apparatus. Apparatus should be retired from service at twenty years of age. Present practice indicates the recommended service periods and protocols are usually followed by the first purchaser. However, at the end of that period, the apparatus is either traded in on new apparatus or sold to another fire department. At this juncture, the unit may have one or more faults which preclude effective use for emergency service. These deficiencies include:

a. Inadequate braking system
b. Slow pick-up and acceleration
c. Structurally weakened chassis due to constant load bearing and/or overloading
d. Pump wear

FUS has modified its application of the age requirement for used or rebuilt apparatus. Due to municipal budget constraints within small communities we have continued to recognize apparatus over twenty years of age, provided the truck successfully meets the recommended annual tests and has been deemed to be in excellent mechanical condition. The specified service tests are outlined below under the heading "Recommended Service Tests for Used or Modified Fire Apparatus". Testing and apparatus maintenance should only be completed by a technician who is certified to an appropriate level in accordance with NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications*.

Insurance grading recognition may be extended for a limited period of time if we receive documentation verifying that the apparatus has successfully passed the specified tests. If the apparatus does not pass the required tests or experiences long periods of "downtime" we may request the municipal authority to replace the equipment with new or newer apparatus. If replacement does not occur, fire insurance grading recognition may be revoked for the specific apparatus which may adversely affect the fire insurance grades of the community. This can also affect the rates of insurance for property owners throughout the community.

Table 1 Service Schedule for Fire Apparatus For Fire Insurance Grading Purposes

Apparatus Age	Major Cities [3]	Medium Sized Cities [4]	Small Communities [5] and Rural Centres
0 – 15 Years	First Line Duty	First Line Duty	First Line Duty
16 – 20 Years	Reserve	2nd Line Duty	First Line Duty
20 – 25 Years [1]	No Credit in Grading	No Credit in Grading *or* *Reserve [2]*	No Credit in Grading *or* *2nd Line Duty [2]*
26 – 29 Years [1]	No Credit in Grading	No Credit in Grading *or* *Reserve [2]*	No Credit in Grading *or* *Reserve [2]*
30 Years +	No Credit in Grading	No Credit in Grading	No Credit in Grading

[1] All listed fire apparatus 20 years of age and older are required to be service tested by recognized testing agency on an annual basis to be eligible for grading recognition. (NFPA 1071)

[2] Exceptions to age status may be considered in a small to medium sized communities and rural centres conditionally, when apparatus condition is acceptable and apparatus successfully passes required testing.

[3] Major Cities are defined as an incorporated or unincorporated community that has:
- *a populated area (or multiple areas) with a density of at least 400 people per square kilometre; AND*
- *a total population of 100,000 or greater.*

[4] Medium Communities are defined as an incorporated or unincorporated community that has:
- *a populated area (or multiple areas) with a density of at least 200 people per square kilometre; AND/OR*
- *a total population of 1,000 or greater.*

[5] Small Communities are defined as an incorporated or unincorporated community that has:
- *no populated areas with densities that exceed 200 people per square kilometre; AND*
- *does not have a total population in excess of 1,000.*

Table 2 Frequency of Listed Fire Apparatus Acceptance and Service Tests

	Frequency of Test					
	@ Time of Purchase New or Used	**Annual Basis**	**@ 15 Years**	**@ 20 Years *See Note 4***	**20 to 25 Years (annually)**	**After Extensive Repairs *See Note 5***
Recommended For Fire Insurance Purposes	Acceptance Test if new; Service Test if used & < 20 Years	Service Test	Acceptance Test	Acceptance Test	Acceptance Test	Acceptance or Service Test depending on extent of repair
Required For Fire Insurance Purposes	Acceptance Test if new; Service Test if used & < 20 Years	No Test Required	No Test Required	Acceptance Test	Acceptance Test	Acceptance or Service Test depending on extent of repair
Factor in FUS Grading	Yes	Yes	Yes	Yes	Yes	Yes
Required By Listing Agency	Acceptance Test	No	No	No	N/A	Acceptance Test
Required By NFPA *See Note 6*	Acceptance Test	Annual Service Test	Annual Service Test	Annual Service Test	Annual Service Test	Service Test

Note 1: See: 'Service Tests for Used or Rebuilt Fire Apparatus' for description of applicable tests
Note 2: Acceptance Tests consist of 60 minute capacity and 30 minute pressure tests
Note 3: Service Tests consist of 20 minute capacity test and 10 minute pressure test in addition to other listed tests
Note 4: Apparatus exceeding 20 years of age may not be considered to be eligible for insurance grading purposes regardless of testing. Application must be made in writing to Fire Underwriters Survey for an extension of the grade-able life of the apparatus.
Note 5: Testing after extensive repairs should occur regardless of apparatus age within reason.
Note 6: Acceptance Tests: See NFPA 1901, Standard for Automotive Fire Apparatus
Service Tests: See NFPA 1911, Standard for Service Tests of Fire Pump Systems on Fire Apparatus, Article 5.1

SERVICE TESTS FOR USED OR MODIFIED FIRE APPARATUS

The intent of this document is to ensure that all used or modified fire apparatus, equipped with a pump or used for tanker service, essentially meet the requirements of Underwriters' Laboratories of Canada (ULC) "Standard for Automobile Fire Fighting Apparatus" S515-04 or subsequent (current) editions of the Standard. Full adherence with the following specified tests is recommended when purchasing used apparatus.

Weight Tests

Load Balance Test:

When fully laden (including a 460kg (1000 lbs) personnel weight, full fuel and water tanks, specified load of hose and miscellaneous equipment), the vehicle shall have a load balance of 22% to 50% of total vehicle mass on the front axle and 50% to 78% of this mass on the rear axle.

Distribution of mass of 33% and 67% respectively on the front and rear axles is preferable for a vehicle having dual rear tires or tandem rear axles.

For a vehicle having tandem rear axles and dual tires on each axle, a loading of between 18% and 25% on the front axle with the balance of mass on the rear axles is permissible.

Road Tests

Acceleration Tests:

2.1.1) From a standing start, the apparatus shall attain a true speed of 55 km/h (35 mph) within 25 seconds for Pumpers carrying up to 3,150 litres (700 gallons) of water.

For apparatus carrying in excess of 3,150 litres (700 gallons) or apparatus equipped with aerial ladders or elevating platforms, a true speed of 55 km/h (35 mph) in 30 seconds should be attained.

2.1.2) The vehicle should attain a top speed of at least 80 km/h (50mph).

Braking Test:

The service brakes shall be capable of bringing the fully laden apparatus to a complete stop from an initial speed of 30 km/h (20 mph) in a distance not exceeding 9 metres (30 feet) by actual measurement. The test should be conducted on a dry, hard surfaced road that is free of loose material, oil and grease.

Pump Performance Tests

Hydrostatic Test

Recent evidence of hydrostatic testing of the pump for 10 minutes at a minimum pressure of 3,400 kPa (500 psi). APPLICABLE TO NEW OR REBUILT PUMPS ONLY (see 3.3).

Priming and Suction Capability Tests

Vacuum Test:

The pump priming device, with a capped suction at least 6 metres (20 feet) long, shall develop –75 kPa (22 inches of mercury) at altitudes up to 300 metres (1000 feet) and hold the vacuum with a drop of not in excess of 34 kPa (10 inches of mercury) in 10 minutes.

For every 300 metres (1000 feet) of elevation, the required vacuum shall be reduced 3.4 kPa (1 inch mercury).

The primer shall not be used after the 10-minute test period has been started. The test shall be made with discharge outlets uncapped.

Suction Capability Test:

The pump (in parallel or series) when dry, shall be capable of taking suction and discharging water with a lift of not more than 3 metres (10 feet) through 6 metres (20 feet) of suction hose of appropriate size, in not more than 30 seconds and not over 45 seconds for 6000 L/min (1320 Igpm) or larger capacity pumps. Where front or rear suction is provided on midship pumps, an additional 10 seconds priming time will be allowed. The test shall be conducted with all discharge caps removed.

Pump Performance

Capacity Test:

Consists of drafting water (preferably with a 10 feet lift) and pumping the rated capacity at 1000 kPa (150 psi) net pump pressure for a continuous period of at least 1 hour.

Pressure Test:

Under the same conditions as in 3.3.1 above pumping 50% of the rated capacity at 1700 kPa (250 psi) net pump pressure for at least ½ hour

For additional information on the above noted tests and test procedures, the following documents provide useful data:

- Underwriters Laboratories of Canada (ULC) publication titled S515 Standard for Automobile Fire Fighting Apparatus, latest edition.
- Fire Underwriters Survey (FUS) publication titled Fire Stream Tables and Testing Data latest edition.

- International Fire Service Training Association (IFSTA) publication titled Fire Department Pumping Apparatus, latest edition.

- National Fire Protection Association (NFPA) 1901 Standard for Automotive Fire Apparatus, latest edition.

- National Fire Protection Association (NFPA) 1911 Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus, latest edition.

- National Fire Protection Association (NFPA) 1912 Standard for Fire Apparatus Refurbishing, latest edition.

For further information regarding the acceptability of emergency apparatus for fire insurance grading purposes, please contact:

Appendix C

TECHNICAL BULLETIN

FIRE UNDERWRITERS SURVEY™

A Service to Insurers and Municipalities

LADDERS AND AERIALS: WHEN ARE THEY REQUIRED OR NEEDED?

Numerous standards are used to determine the need for aerial apparatus and ladder equipment within communities. This type of apparatus is typically needed to provide a reasonable level of response within a community when buildings of an increased risk profile (fire) are permitted to be constructed within the community.

Please find the following information regarding the requirements for aerial apparatus/ladder companies from the Fire Underwriters Survey Classification Standard for Public Fire Protection.

Fire Underwriters Survey

Ladder/Service company operations are normally intended to provide primary property protection operations such as:

1.) Forcible entry;

2.) Utility shut-off;

3.) Ladder placement;

4.) Ventilation;

5.) Salvage and Overhaul;

6.) Lighting.

Response areas with five (5) buildings that are three (3) stories or 10.7 meters (35 feet) or more in height, or districts that have a Basic Fire Flow greater than 15,000 LPM (3,300 IGPM), or any combination of these criteria, should have a ladder company. The height of all buildings in the community, including those protected by automatic sprinklers, is considered when determining the number of needed ladder companies. When no individual response area/district alone needs a ladder company, at least one ladder company is needed if the sum of buildings in the fire protection area meets the above criteria.

The needed length of an aerial ladder, an elevating platform and an elevating stream device shall be determined by the height of the tallest building in the ladder/service district (fire protection area) used to determine the need for a ladder company. One storey normally equals at least 3 meters (10 feet). Building setback is not to be considered in the height determination. An allowance is built into the ladder design for normal access. The maximum height needed for grading purposes shall be 30.5 meters

Exception: When the height of the tallest building is 15.2 meters (50 feet) or less no credit shall be given for an aerial ladder, elevating platform or elevating stream device that has a length less than 15.2 meters (50 feet). This provision is necessary to ensure that the water stream from an elevating stream device has additional "reach" for large area, low height buildings, and the aerial ladder or elevating platform may be extended to compensate for possible topographical conditions that may exist. See Fire Underwriters Survey - Table of Effective Response (attached).
Furthermore, please find the following information regarding communities' need for aerial apparatus/ladder companies within the National Fire Protection Association.

NFPA

Response Capabilities: The fire department should be prepared to provide the necessary response of apparatus, equipment and staffing to control the anticipated routine fire load for its community.

NFPA *Fire Protection Handbook, 20th Edition* cites the following apparatus response for each designated condition:

HIGH-HAZARD OCCUPANCIES (schools, hospitals, nursing homes, explosive plants, refineries, high-rise buildings, and other high-risk or large fire potential occupancies):

*At least four pumpers, **two ladder trucks** (or combination apparatus with equivalent capabilities), two chief officers, and other specialized apparatus as may be needed to cope with the combustible involved; not fewer than 24 firefighters and two chief officers.*

MEDIUM-HAZARD OCCUPANCIES (apartments, offices, mercantile and industrial occupancies not normally requiring extensive rescue or firefighting forces):

*At least three pumpers, **one ladder truck** (or combination apparatus with equivalent capabilities), one chief officer, and other specialized apparatus as may be needed or available; not fewer than 16 firefighters and one chief officer.*

LOW-HAZARD OCCUPANCIES (one-, two-, or three-family dwellings and scattered small businesses and industrial occupancies):

*At least two pumpers, **one ladder truck** (or combination apparatus with equivalent capabilities), one chief officer, and other specialized apparatus as may be needed or available; not fewer than 12 firefighters and one chief officer.*

In addition to the previous references, the following excerpt from the 2006 Ontario Building Code is also important to consider when selecting the appropriate level of fire department response capacity and building design requirements with regard to built-in protection levels (passive and active fire protection systems).

Excerpt: National Building Code 2006

A-3 Application of Part 3.

In applying the requirements of this Part, it is intended that they be applied with discretion to buildings of unusual configuration that do not clearly conform to the specific requirements, or to buildings in which processes are carried out which make compliance with particular requirements in this Part impracticable. The definition of "building" as it applies to this Code is general and encompasses most structures, including those which would not normally be considered as buildings in the layman's sense. This occurs more often in industrial uses, particularly those involving manufacturing facilities and equipment that require specialized design that may make it impracticable to follow the specific requirements of this Part. Steel mills, aluminum plants, refining, power generation and liquid storage facilities are examples. A water tank or an oil refinery, for example, has no floor area, so it is obvious that requirements for exits from floor areas would not apply. Requirements for structural fire protection in large steel mills and pulp and paper mills, particularly in certain portions, may not be practicable to achieve in terms of the construction normally used and the operations for which the space is to be used. In other portions of the same building, however, it may be quite reasonable to require that the provisions of this Part be applied (e.g., the office portions). Similarly, areas of industrial occupancy which may be occupied only periodically by service staff, such as equipment penthouses, normally would not need to have the same type of exit facility as floor areas occupied on a continuing basis. It is expected that judgment will be exercised in evaluating the application of a requirement in those cases when extenuating circumstances require special consideration, provided the occupants' safety is not endangered.

The provisions in this Part for fire protection features installed in buildings are intended to provide a minimum acceptable level of public safety. It is intended that all fire protection features of a building, whether required or not, will be designed in conformance with good fire protection engineering practice and will meet the appropriate installation requirements in relevant standards. Good design is necessary to ensure that the level of public safety established by the Code requirements will not be reduced by a voluntary installation.

Firefighting Assumptions

The requirements of this Part are based on the assumption that firefighting capabilities are available in the event of a fire emergency. These firefighting capabilities may take the form of a paid or volunteer public fire department or in some cases a private fire brigade. If these firefighting capabilities are not available, additional fire safety measures may be required.

Firefighting capability can vary from municipality to municipality. Generally, larger municipalities have greater firefighting capability than smaller ones. Similarly, older, well established municipalities may have better firefighting facilities than newly formed or rapidly growing ones. The level of municipal fire protection considered to be adequate will normally depend on both

the size of the municipality (i.e., the number of buildings to be protected) and the size of buildings within that municipality. Since larger buildings tend to be located in larger municipalities, they are generally, but not always, favoured with a higher level of municipal protection.

Although it is reasonable to consider that some level of municipal firefighting capability was assumed in developing the fire safety provisions in Part 3, this was not done on a consistent or defined basis. The requirements in the Code, while developed in the light of commonly prevailing municipal fire protection levels, do not attempt to relate the size of building to the level of municipal protection. **The responsibility for controlling the maximum size of building to be permitted in a municipality in relation to local firefighting capability rests with the municipality. If a proposed building is too large, either in terms of floor area or building height, to receive reasonable protection from the municipal fire department, fire protection requirements in addition to those prescribed in this Code, may be necessary to compensate for this deficiency.** Automatic sprinkler protection may be one option to be considered.

The municipality may, in light of its firefighting capability, elect to introduce zoning restrictions to ensure that the maximum building size is related to available municipal fire protection facilities. This is, by necessity, a somewhat arbitrary decision and should be made in consultation with the local firefighting service, who should have an appreciation of their capability to fight fires.

The requirements of Subsection 3.2.3 are intended to prevent fire spread from thermal radiation assuming there is adequate firefighting available. It has been found that periods of from 10 to 30 minutes usually elapse between the outbreak of fire in a building that is not protected with an automatic sprinkler system and the attainment of high radiation levels. During this period, the specified spatial separations should prove adequate to inhibit ignition of an exposed building face or the interior of an adjacent building by radiation. Subsequently, however, reduction of the fire intensity by firefighting and the protective wetting of the exposed building face will often be necessary as supplementary measures to inhibit fire spread.

In the case of a building that is sprinklered throughout, the automatic sprinkler system should control the fire to an extent that radiation to neighboring buildings should be minimal. Although there will be some radiation effect on a sprinklered building from a fire in a neighboring building, the internal sprinkler system should control any fires that might be ignited in the building and thereby minimize the possibility of the fire spreading into the exposed building. NFPA 80A, “Protection of Buildings from Exterior Fire Exposures,” provides additional information on the possibility of fire spread at building exteriors.

The water supply requirements for fire protection installations depend on the requirements of any automatic sprinkler installations and also on the number of fire streams that may be needed at any fire, having regard to the length of time the streams will have to be used. Both these factors are largely influenced by the conditions at the building to be equipped, and the quantity and pressure of water needed for the protection of both the interior and exterior of the building must be ascertained before the water supply is decided upon. Acceptable water supplies may be a

public waterworks system that has adequate pressure and discharge capacity, automatic fire pumps, pressure tanks, manually controlled fire pumps in combination with pressure tanks, gravity tanks, and manually controlled fire pumps operated by remote control devices at each hose station.

Appendix D

By-law 2014-84

A By-law of the City of Greater Sudbury to Establish and Regulate The City of Greater Sudbury Fire Services

Whereas the *Municipal Act, 2001*, S.O. 2001 Chapter 25, as amended, provides that a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under the Act;

And Whereas Section 2 of the *Fire Protection and Prevention Act, 1997*, S.O., c.4 as amended, requires a municipality to establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention and to provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances;

And Whereas Section 5 of the *Fire Protection and Prevention Act, 1997*, S.O., c.4 as amended, allows the council of every municipality to enact a by-law to establish, maintain and operate a fire department to provide fire suppression services and other fire protection services within the municipality;

And Whereas the Council for the City of Greater Sudbury wishes to continue its fire department and to set out the fire protection services to be offered by its fire department in various geographic areas of the City;

Now therefore the Council of the City of Greater Sudbury hereby enacts as follows:

Definitions

1. In this by-law, unless the context otherwise requires.

"Act" means the *Fire Protection and Prevention Act, 1997*, S.O. 1997, c. 4, as may be amended from time to time, and includes any successor legislation, and any and all regulations made under that statute, including the Ontario Fire Code;

"Applicable Law" includes federal, provincial and municipal statutes, regulations thereunder, codes, directives, which have application to the situation at hand, the Collective Agreement and any agreement entered into by the City;

"Chief of Fire and Paramedic Services" means the person appointed by Council to act as the Chief of Fire and Paramedic Services for the City and includes his or her authorized designate;

"City" means the municipal corporation of the City of Greater Sudbury or the geographical area, as the context requires;

"Collective Agreement" means an agreement between the City and the Sudbury Professional Firefighter's Association, Local 527 of the International Association of Firefighters and the Eastern Ontario Volunteer Firefighters Association, Local 920 affiliated with the Christian Labour Association of Canada made under the provisions of the Act and includes any amendments thereto;

"Deputy Fire Chief" means a person appointed as a Deputy Fire Chief and includes his or her authorized designate;

"Executive Deputy Chief" means the person appointed by Council as the Executive Deputy Chief of Fire and Paramedic Services and includes his or her authorized designate;

"Fire Beat" means a geographic area of the City within which a designated fire station is primarily responsible for delivery of specified Fire Protection Services;

"Fire Chief" means the Chief of Fire and Paramedic Services;

"Fire Services" means the City of Greater Sudbury Fire Services;

"Fire Protection Services" includes fire suppression, fire prevention, fire safety education, communication, training or persons involved in the provision of fire protection services, rescue and emergency services and the delivery of all those services;

"Firefighter" means a Fire Chief and any other person employed in, or appointed to, a fire department and assigned to undertake fire protection services, and includes a Volunteer Firefighter;

"Officer" means any personnel in the Fire Services bearing the rank of lieutenant, captain or higher; and

"Volunteer Firefighter" means a Firefighter who provides Fire Protection Services for or on behalf of the Fire Service, under the direction of the Fire Chief, either voluntarily or for a nominal consideration, honorarium, training or activity allowance.

Fire Services Continued and Organized

2.-(1) The Fire Services is hereby continued under the name of "City of Greater Sudbury Fire Services".

(2) The Fire Services shall include: the Fire Chief, the Executive Deputy Chief of Fire and Paramedic Services, such Deputy Fire Chiefs as may be appointed by Council from time to time, and such other persons as may be employed by or appointed by the City from time to time.

(3) Within the Fire Services, Firefighters shall report to Officers who report to the Deputy Fire Chiefs who report to the Executive Deputy Chief of Fire and Paramedic Services, who in turn shall report to the Fire Chief. The Fire Chief shall report to Council through the City's Chief Administrative Officer.

(4) The Fire Services shall be subdivided into the following sections, primarily responsible for the performance of the functions assigned by the Fire Chief to such section from time to time: Administration Section, Emergency Operations Section, Fleet Services Section, Training Section, Fire Prevention Section and Public Education Section. Each section shall report to the Fire Chief through a Deputy Fire Chief as determined by the Fire Chief from time to time.

(5) The Fire Chief may, in his discretion, assign Firefighters within the Fire Services to such section of the Fire Services identified in Subsection 2(4) as he may determine from time to time.

(6) The Fire Chief may assign Firefighters within the Fire Services to such fire stations in such Fire Beats as the Fire Chief may determined from time to time, subject to the provisions of Subsection 5(2) .

Fire Chief

3.-(1) The Fire Chief is assigned the responsibility for the administration of this By-law and for the administration and operation of the Fire Services.

(2) The Fire Chief is delegated the authority to:

(a) make all decisions required of the Fire Chief under this By-law;

(b) perform all administrative functions identified herein and those incidental to and necessary for the due administration of this By-law, the administration and operation of the Fire Services, the delivery of Fire Protection Services;

(c) carry out the Mandate, Vision and Primary Goals of the Fire Services set out in Schedule A and without limiting the generality of the foregoing develop, implement and amend as necessary from time to time, proper measures for:
(i) prevention, control and suppression of fires;
(ii) the protection and saving of life and property;
(iii) emergency responses; and
(iv) public education around issues of life safety and fire prevention;

(d) develop, implement and monitor appropriate training programs for Firefighters within the Fire Services, as in the opinion of the Fire Chief are required from time to time; and

(e) establish, implement, enforce and amend from time to time such policies and procedures as the Fire Chief may determine are required to implement this Bylaw, to deliver the Fire Protection Services within budgetary guidelines and staffing complements, and to ensure the appropriate care and protection of all Fire Services Firefighters and equipment. Without limiting the generality of the foregoing, the policies and procedures shall include standard operating procedures and guidelines, general orders and department rules.

(4) The Fire Chief shall exercise all powers and duties mandated by the Act, any other Applicable Law, including but not limited to:

(a) duties assigned as an Assistants to the Fire Marshal as designated under the Act;

(b) duties assigned under the Act to the Chief Fire Official;

(c) appointing a Firefighter or Firefighters to act as Chief Fire Official under the Act in the absence of the Fire Chief;

(d) enforcing compliance with the Fire Code made under the Act;

(e) duties assigned under the Act to the Fire Co-ordinator; and

(f) entering into fire protection agreements as that term is defined under the Act.

(5) In exercising his discretion under this By-law or the Act the Fire Chief shall consider as applicable:

(a) the Act and other Applicable Law;

(b) budgetary constraints and available resources, including without limitation reliance on Volunteer Firefighters and the type and quantity of equipment available, the training level of available Firefighters;

(c) the safety of all Firefighters; and

(d) the particular circumstances in which a decision must be made including without limitation, the availability and condition of access routes to the site where a response has been requested.

Fire Chief - Delegation / Absences

4.-(1) The Fire Chief may delegate the performance of any one or more of his or her functions under this By-law to one or more persons from time to time as the occasion requires and may impose conditions upon such delegation and may revoke any such delegation. The Fire Chief may continue to exercise any function delegated during the delegation.

(2) In the absence of delegated authority in accordance with Subsection 4(1), in the event of the absence of the person identified in Column A below, the person identified in Column B below is authorized to act in the place of the Fire Chief and may exercise all of the powers of and shall perform all of the duties of the Fire Chief:

Column A **Position**	**Column B** **Person who acts in the absence of the Person(s) filling the Position in Column A**
Fire Chief	Executive Deputy Chief of Fire and Paramedic Services
Fire Chief and Executive Deputy Chief of Fire and Paramedic Services	A Deputy Fire Chief, in accordance with protocols established by the Fire Chief
Fire Chief and Executive Deputy Chief of Fire and Paramedic Services and all Deputy Fire Chiefs	senior Officer on duty in accordance with protocols established by the Fire Chief
Fire Chief and Executive Deputy Chief of Fire and Paramedic Services and all Deputy Fire Chiefs and all Officers	a Firefighter appointed in accordance with policies established by the Fire Chief

Fire Beats / Delivery of Fire Protection Services

5.-(1) The City shall be divided into 26 Fire Beats as shown on Schedule B and bearing the name shown on Schedule B. Each Fire Beat shall have a fire station in the location shown on Schedule B or such other location as may be determined by the Fire Chief from time to time.

(2) Each Fire Beat identified in Column A of the chart below, shall be staffed by fulltime Firefighters who are not Volunteer Firefighters, by Volunteer Firefighters or by a combination thereof, as set out on the corresponding line in Column B in the chart below:

Column A Fire Beats as shown in Schedule C	Column B Fire Protection Services to be delivered within such Fire Beats by Fire Services Firefighters who are
Van Horne, Minnow Lake, Leon (New Sudbury) Long Lake	Fulltime Firefighters who are not Volunteer Firefighters
Copper Cliff, Waters, Lively, Whitefish, Beaver Lake, Azilda, Chelmsford, Dowling, Vermillion, Levack, Val Caron, Hanmer, Capreol, Garson, Falconbridge, Skead, Coniston, Wahnapitae, Red Deer	Volunteer Firefighters
Val Therese	Composite of Volunteer Firefighters and Fulltime Firefighters who are not Volunteer Firefighters

(3) The Fire Chief shall in his discretion determine from time to time, which of the Fire Protection Services described in Schedule C shall be provided within each Fire Beat

(4) Fire Protection Services shall be delivered within each Fire Beat primarily by the Firefighters staffing the fire station within that Fire Beat, but nothing herein limits the delivery of Fire Protection Services across the boundaries of Fire Beats or limits the Fire Chief in directing the delivery of Fire Protection Services.

(5) Fire Protection Services shall be delivered under the direction of the Fire Chief within budgetary constraints and with resources then available to the Fire Chief. The delivery of Fire Protection Services shall be subject also to the circumstances and constraints at the time of the response, including without limitation, other demands for Fire Protection Services, unsafe conditions encountered on route or at the site of the response, impediments to access, environmental factors, topographical features, the Fire Beat and location of the property for which Fire Protection Services are requested and Applicable Law, including without limitation, the *Occupational Health and Safety Act*, R.S.O. 1990, c. O.1, and the *Technical Standards and Safety Act, 2000*, S.O. 2000, c. 16.

(6) Despite anything else herein, the Fire Chief, may, in his discretion, provide Fire Protection Services of a type not specifically provided for in this By-law or provided for within a particular Fire Beat where the Fire Chief determines that it is necessary and appropriate in the circumstances, and not otherwise prohibited by Applicable Law.

Fires and Emergencies

6.-(1) Where in the opinion of the Fire Chief it is necessary for the prevention, control and extinguishment of fires and the protection of life and property, the Fire Chief may authorize:

(a) the suppression of any fire by extinguishing it and to enter private property if it is necessary to do so;

(b) the pulling down or demolition of any building or structure to prevent the spread of fire; or

(c) the taking of such other actions as are necessary in the circumstances, including without limitation, boarding up or barricading of buildings or property to guard against fire or other danger, risk or accident when unable to contact the property owner.

(2) Any expenses incurred by the City in engaging in the actions authorized under Paragraphs 6(1)(b) or (c) are a debt owed by the owner of the property on which the action or actions were taken and may be recovered by the City in any manner authorized pursuant to the *Municipal Act, 2001* and the Act.

Calls Outside of the City

7.-(1) The Fire Chief shall not authorize the Fire Services to respond to a call with respect to a fire or emergency outside the limits of the City unless, in the opinion of the Fire Chief it is appropriate to do so in the circumstances and the fire or emergency:

(a) in the opinion of the Fire Chief, threatens property in the City or property situated outside the City that is owned or occupied by the City;

(b) is in a municipality with which an agreement has been entered into to provide Fire Protection Services which may include a Automatic Aid Protection Agreement or a Mutual Aid agreement as those terms are defined from time to time under the Act;

(c) is on property with respect to which a Fire Protection agreement or other agreement, has been entered into by the City to provide Fire Protection Services to that property;

(d) is in a municipality authorized to participate in any county, district or regional mutual aid plan established by a Fire Co-ordinator appointed by the Fire Marshal pursuant to the Act or any other similar reciprocal plan or program on property beyond the City; or

(e) requires immediate action to preserve life or property and the appropriate department in the other municipality is notified to respond and assume command or establish alternative measures acceptable to the Fire Chief.

(2) The Fire Chief shall inform Council of the delivery of any Fire Protection Services outside the City pursuant to this Section 7, within a reasonable time thereafter.

(3) Nothing in Section 7 shall impose a duty on the Fire Services to respond to a fire or emergency outside of the limits of the City.

Recovery of Costs – Additional Expenses

8.-(1) Owners of properties and other persons to whom or for whose benefit Fire Protection Services have been provided shall be subject to the fees and charges established in the City's Miscellaneous User Fee By-law then in effect for such Fire Protection Services, whether such persons reside within or outside the limits of the City. The Fire Chief may invoice such persons in accordance with the City's Miscellaneous User Fee By-law.

(2) If the Fire Chief determines that in the delivery of Fire Protection Services it is necessary to incur additional expenses to retain a private contractor, rent special equipment not normally carried on a fire apparatus, use more materials than are carried on a fire response vehicle, prevent damage to equipment owned by or contracted to the City, to assist in or otherwise conduct an investigation into the cause of a fire or otherwise carry out the duties and functions of the Fire Service, then the owner of the real or personal property requiring or causing the need for those additional expenses shall be liable for the full costs thereof, including any applicable taxes. The Fire Chief may invoice such person and any such amount shall be a debt owing to the City, due on the terms set out in the invoice and collectable by any means available to the City at law.

Interpretation

9.-(1) Whenever this By-law refers to a person or thing with reference to gender or the gender neutral, the intention is to read the By-law with the gender applicable to the circumstances.

(2) References to items in the plural include the singular, as applicable.

(3) The words "include", "including" and "includes" are not to be read as limiting the phrases or descriptions that precede them. Any examples provided are intended to be representative examples and not intended to be an exhaustive list;

(4) Headings are inserted for ease of reference only and are not to be used as interpretation aids.

(5) Specific references to laws in the By-law are printed in italic font and are meant to refer to the current laws applicable with the Province of Ontario as at the time the By-law was enacted, as they are amended from time to time.

(6) Any reference to periods of time, stated in numbers of days, shall be deemed applicable on the first business day after a Sunday or Statutory holiday if the expiration of the time period occurs on a Sunday or Statutory holiday.

(7) The obligations imposed by this By-law are in addition to obligations otherwise imposed by law or contract.

(8) Terms with capitals shall be read with the meaning in Section 1, and other words shall be given their ordinary meaning.

Severability / Conflict

10.-(1) If any section, subsection, part or parts of this By-law is declared by any court of law to be bad, illegal or ultra vires, such section, subsection, part or parts shall be deemed to be severable and all parts hereof are declared to be separate and independent and enacted as such.

(2) Nothing in this By-law relieves any person from complying with any provision of any Federal or Provincial legislation or any other By-law of the City.

(3) Where a provision of this By-law conflicts with the provisions of another By-law in force in the City, the provision that establishes the higher standard to protect the health, safety and welfare of the general public shall prevail.

Short Title

11. This By-law may be referred to as the "Fire Services By-law".

Schedules

12. The following schedule is incorporated into and forms a part of this By-law:

Schedule "A"	Mandate of the Fire Services
Schedule "B"	Fire Beats and Stations
Schedule "C"	Fire Protection Services – Described

Repeals

13. By-law 2012-146 of the City of Greater Sudbury and all amendments thereto are hereby repealed.

Conflicts

14. Where a provision of this By-law conflicts with the provisions of another By-law in force in the City, the provision that establishes the higher standard to protect the health, safety and welfare of the general public shall prevail.

Enactment

15. This By-law shall come into force and take effect immediately upon the final passing thereof.

READ AND PASSED IN OPEN COUNCIL this 8th day of April, 2014

Mayor

Clerk

Schedule "A" To By-law 2014-84

Mandate of the Fire Services

The mandate of the Greater Sudbury Fire Services is to provide fire protection services, public fire and life safety education, and fire prevention initiatives to protect the lives and property of the citizens, businesses and visitors to the City of Greater Sudbury.

Vision

The vision of the Greater Sudbury Fire Services is to provide the highest level of fire protection services that will ensure the safety and well being of all citizens and visitors are safe from fire and other public safety hazards.

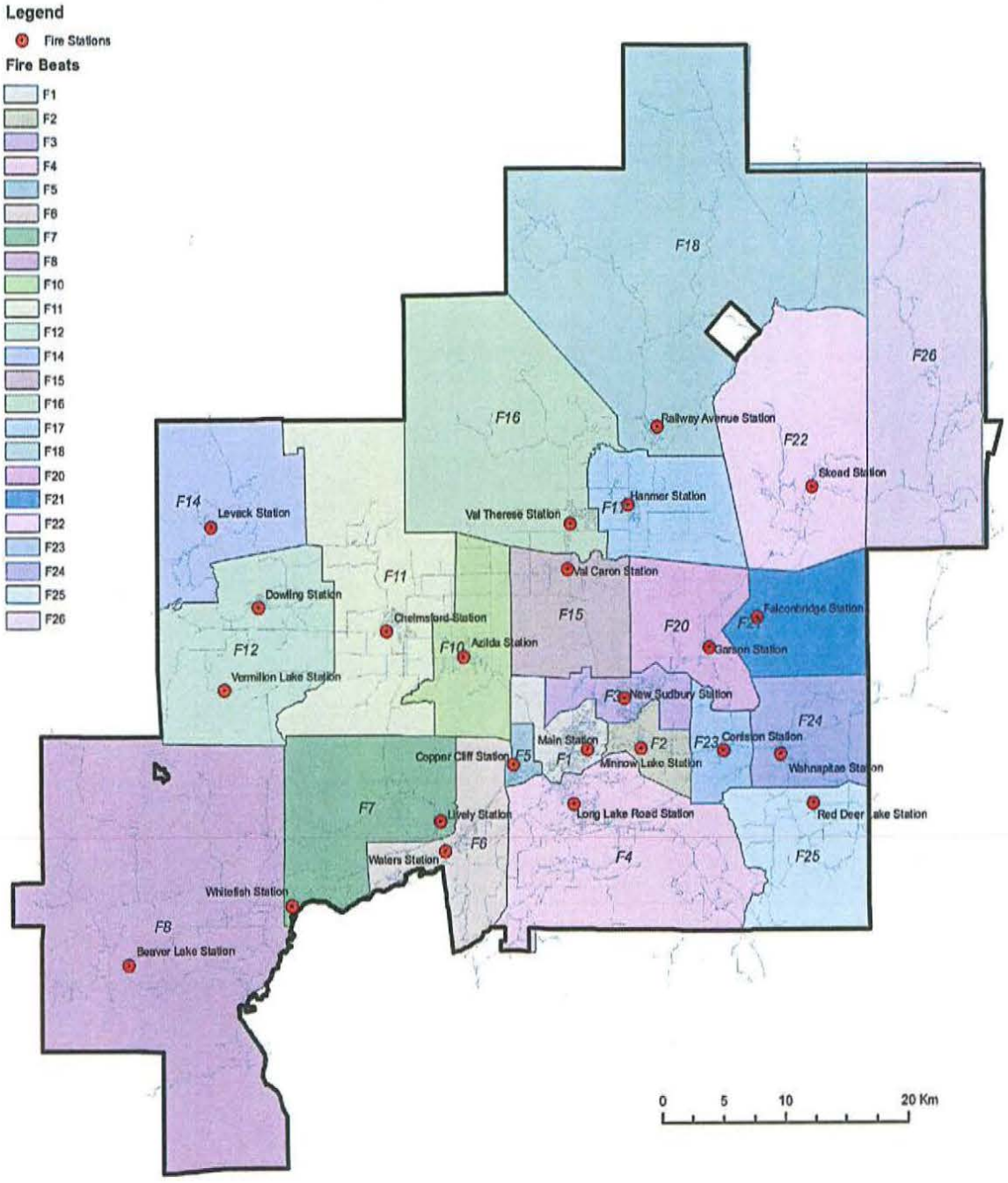
Primary Goals of the Fire Services

The primary goals of the Fire Services;

- Provide appropriate public fire and life safety education and other fire prevention programs and measures as legislated by the *Fire Protection and Prevention Act*;
- Provide exceptional and strategic training to personnel through well planned programs followed by appropriate testing and documentation;
- Provide effective, timely and adequately staffed emergency response and assistance as appropriate to the needs and circumstances of the municipality and as required by the *Fire Protection and Prevention Act, 1997* and other applicable legislation.

Schedule "B" to By-law 2014-84

Fire Beats and Fire Stations



Schedule C TO BY-LAW 2014-84 — Fire Protection Services - Described

Fire Suppression	
Structure	Extinguishment of fire incidents involving residential structures and commercial structures. Fire suppression shall be delivered in an offensive and defensive mode as determined on an incident by incident basis by the Incident Commander at the fire incident and shall include search and/or rescue operations, forcible entry, ventilation, protecting exposures, salvage, overhaul as appropriate, and protection of the scene pending further investigation in accordance with the CGS Fire Service's level of training, standard operating guidelines and Occupational Health and Safety Guidelines.
Vehicle	Extinguishment of fire involving private and commercial vehicles and protection of the scene pending further investigation.
Wild Lands	Extinguishment fire occurring in an area in which development is essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered. Typical fire types include grass fires, bush fires, and forest fires.
Tanker Shuttle	Provision of an alternative water source for fire suppression where hydrants are not available. *Note: Not accredited by the insurance underwriters authority.*
Medical Aid	
First Responder	Medical assistance to the first responder level. Typical interventions include: cardiopulmonary resuscitation (CPR), automated external defibrillator, spinal and bone fracture immobilization, and administration of oxygen: as per the Emergency Services Agreement. *Note: Interventions complement and do not replace advanced medical care provided by Paramedics*

Rescue	
Low Angle	Rescue of persons from areas where terrain has a slope angle from 15 to 35 degrees.
Vehicle Extrication	Rescue of persons trapped in a vehicle through the use of specialized equipment and techniques including hand tools, air bags, and heavy hydraulic tools as required.
Aerial Ladder	Rescue of persons trapped on an elevated platform or structure to maximum elevation of eight stories (approximately 80ft). *Note: Actual effective operating height depends on proximity of equipment to structure, and ground conditions.*
Water Shore Based - Level 1	Rescue of persons from water by reaching or throwing rescue lines. (No water entry).
Water Surface - Level 2	Rescue of persons from the surface of the water through the use of a rescue boat.
Swift Water - Level 2	Rescue of persons from water courses with any current greater than 0.5 m/sec (1 knot).
Ice & Cold Water	Rescue or persons in water that is below 21°C (70°F) including use of shoreline techniques and rescue boats.
Hazardous Materials – (HazMat)	
Awareness (Level 1)	Firefighters trained and able to: recognize, isolate, implement protection protocols, and notify the appropriate response team and/or agency. Firefighters are also trained to provide limited emergency decontamination of persons exposed to hazard.

Inspection, Enforcement & Investigation	
Inspection	The fire inspection program ensures compliance with legislated life safety and property as per the Ontario Fire Code. Fire inspections are completed for all commercial and multi-residential buildings. Single family residential inspection also occurs upon request by owner of if there is a complaint related to a potential violation of the Ontario Fire Code. The inspections ensure that the appropriate fire safety equipment and fire and life safety conditions are maintained and complied with as per the Ontario Fire Code.
Fire Regulation Enforcement	Enforcement action is taken in the form of several options as outlined in the Office of the Fire Marshal's "Inspection Enforcement Guideline Tech Guideline 01-2012' to ensure compliance with the Ontario Fire Protection and Prevention Act.
Investigation (Regulatory Compliance)	Inspections regarding possible non-compliance of Ontario Fire Code that are not a result of an incident. These investigations are typically a result of a concern being raised by the public or other partner agency.
Investigation – Cause & Origin	Investigation and analysis of fire-related incidents to determine the possible origin and cause of the incident of any resulting fire. *Note: Investigations are conducted in collaboration with other agencies such the Ontario Fire Marshal and Police as required.*
Emergency Dispatch & Communications	
Fire Dispatch Services	Fire calls are dispatched by the Greater Sudbury Police Services Communications Centre, which also serves as the 9-1-1 Public Safety Answering Point and handles communications and dispatch for the City's Police Services. Fire dispatch services are governed by an agreement that was enacted prior to the Greater City's amalgamation (circa 1998/99).

Prevention & Permitting	
Fire Extinguisher Training	Public training on the proper use of fire extinguishers.
Youth Arson Prevention	Intervention with youth who have or may been involved with a fire related incident.
Public Awareness & Education	Fire and life safety information and public education programs shall be administered in accordance with the FPPA, 1997 and policies of the Fire Prevention Section. A residential home fire safety and smoke alarm awareness program is provided by the Fire Prevention and Suppression Sections.
Plan Review & Permitting	Review of proposed construction plans and/or installation of appliances that fall within the Ontario Building & Fire Code regulations. Issuance of burn permits as required by exiting by-laws and Ontario Fire Code. *Note: Construction related permits are issued via the Building Controls department.*