

## Incident Summary #II-1122963-2020 (#20292) (FINAL)

SUPPORTING INFORMATION	Incident Date		December 23, 2020	
	Location		Abbotsford	
	Regulated industry sector		Gas - Natural gas system	
	Impact	Injury	Qty injuries	0
			Injury description	N/A
			Injury rating	None
	Damage	Damage	Damage description	Major fire damage to a pigeon barn
			Damage rating	Major
	Incident rating		Major	
Incident overview		A gas fired water heater was turned on to circulate warm water through water lines in a barn to keep them from freezing during cold weather. Several hour later the barn was engulfed in flames.		
INVESTIGATION CONCLUSIONS	Site, system and components		This water heater burns natural gas that transfers heat to the water in the tank and then uses a pump to circulate this warm water throughout the barn to keep water lines from freezing. Areas where water heaters are installed and operating , need to remain free of heavy accumulations of dust , debris and other organic materials so that clean air can mix with natural gas to achieve a safe and controlled combustion process.	
	Failure scenario(s)		On December 22 <sup>nd</sup> 2020, the local area was experiencing snow and cold weather conditions. The owner went to the barn to turn on the water heater and begin circulating warm water throughout the barn around 4:30 PM . He did not notice anything unusual and left the water heater in operation. Early in the morning of Dec. 23 <sup>rd</sup> around 5 am, the fire was noticed and emergency services notified.	
	Facts and evidence		<p>-Owner reported that the water heater in the barn had not been turned on for approximately 1.5 months.</p> <p>-The fire department reported that the fire appeared to have started in the middle of the barn near the mechanical room and spread from there.</p> <p>-Private investigator reported the following:</p> <ul style="list-style-type: none"><li>-No evidence of electrical wiring issues or malfunction inside the barn.</li><li>-Hot water tank was closely examined and found to have large accumulations of burned organic materials inside the burner compartment. Likely nesting materials brought into the burner compartment by rodents. (see picture 1)</li><li>-Venting showed signs of heavy carbon deposits, suggesting an issue with the operation of the water heater or the burning of organic materials causing smoke deposits/ carbon inside the venting.</li><li>-Venting did not appear to have contacted combustible surfaces prior to the incident.</li><li>-No records to indicate if the water heater room or burner compartment had been cleaned or checked by anyone.</li></ul>	

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	<p>-Another barn on the property has a similar water heater installed. It was noted that the area around the burner had accumulations of sawdust and debris. (see picture 2)</p> <p>-Installation/ operation manual states</p> <p>“The flow of combustion/ ventilation air <b>MUST NOT</b> be restricted. Make sure slots in jacket are open and unobstructed. Clear jacket slot openings of any dirt, dust, or other restrictions.”</p> <p>“At all times keep the water heater area clear and free from combustible materials, gasoline and other flammable vapours and liquids.”</p> <p>“Annually remove the inner door and main burner assembly to clean orifices and related parts of any dirt or other foreign material. Inspect the burner ports for obstructions or debris and clean with a wire brush as needed. Wire brush and/or vacuum clean the combustion chamber as needed to remove scale deposits and debris.</p>
<p><b>Causes and contributing factors</b></p>	<p>It's likely that the organic materials found inside the water heaters combustion chamber, caught fire sometime after the water heater was cycled on. Some of the combustible materials very near to the water heater likely came in contact and spread the fire to the rest of the structure.</p>



Water heater found in the barn that was destroyed. Burner compartment was closely examined and found to have a large accumulation of organic materials within. (Red arrow points toward burner compartment)



Picture 2



Water heater in second barn was examined. Combustible materials were found in very close proximity to the burner compartment. Black soot on the tank indicates an issue with this tank as well.