Incident Summary (II-636492-2018)

SUPPORTING INFORMATION	Incident Date		December 15, 2017
	Location		Langley
	Regulated industry sector		Natural gas system
	Impact – Injury	Qty injuries	0
		Injury description	None
		Injury rating	None
	Impact – Damage	Damage description	Fire damage was contained to exterior wall behind gas fireplace termination
		Damage rating	Minor
	Incident rating		Minor
	Incident overview		A new installation of a gas fireplace installed in a two year old home overheated the combustible wall and caused a minor fire at the side wall termination
INVESTIGATION CONCLUSIONS	Site, system and components		The fireplace installation was a direct vent installation, the chimney has a five inch inside pipe for exhausting the flue products and a eight inch outside pipe for combustion air that extends from the fireplace flue connection to the side wall exhaust termination allowing for sealed combustion, this fireplace is sealed from the interior of the home and uses outside air for combustion. When this type of fireplace is installed the manufactures tests and certifies the installation with required clearances to the fireplace shell and venting materials To begin the operation of the fireplace unit, the user must turn on the gas supply and ignite the burners. Once this is done, the unit will operate completely autonomously until the gas supply to the burners is shut off. While in operation, convection will cause the hot air in the firebox to rise to the top of the firebox. As the amount of hot exhaust gasses increases from the combustion process, the hot gas at the top of the firebox is eventually pushed out through the inner flue. At the same time, the removal of the exhaust gasses through the inner flue allows for relatively cold air to be drawn into the firebox through the outer flue. As the firebox heats up due to the operation of the burners, it radiates heat into the room through the porous glass face that separates the firebox from the inside of the room. At the same time, it transfers heat through the surrounding metal walls into the empty space in between itself and the outer housing. This heat transfer creates a convection process inside of the empty space that is very similar to the one that takes place inside of the firebox. Built into the design of the room facing side of the unit are two vents, one at the top and one at the bottom. Once the air in the empty space begins to heat up, convection pushes this heated air further up in the chamber until it is eventually pushed out through the top vent. This phenomenon works in the same way to draw air in through the bottom vent. As the hot air is pushed out, space is emptied in the chamber behind the firebox, which then draws cold air in through the bottom vent.

	Both of these convection processes immediately begin to slow down, and eventually stop, as soon as the burners turn off.
Failure scenario(s)	Home owner was using fireplace when fire occurred caused by flue gas (heat) escaping from venting system into combustible space just behind vent termination
Facts and evidence	. - Two year old installation – confirmed by gas permit - Conversation with owner, he indicated that the fireplace was used 6-8 times over the last two years - Photographic evidence indicates that the fires origin was directly behind the fireplace vent termination - The fire was contained to the area behind the vent termination by the building fire stopping based on the photographic evidence
Causes and contributing factors	. - The plausible cause of this fire was that the vent pipe and intake piping was split open inside the combustible area directly behind the vent termination allow flue gases to escape which caused the wood framing to catch on fire

Photos or diagrams (if necessary)

Interior view

Location of fire origin

Damage to exterior wall

Shows heat was most intense at top edge

Top and front view of termination