

**THE CORPORATION OF THE TOWNSHIP OF TAY
PUBLIC MEETING OF MUNICIPAL COUNCIL**

Outdoor Wood Burning Furnaces

NOVEMBER 11TH, 2009 at 7:00 P.M.

**COUNCIL CHAMBERS
AGENDA**

- 1. CALL TO ORDER**
- 2. MOMENT OF SILENT REFLECTION**
- 3. DECLARATIONS OF PECUNIARY INTEREST**
- 4. STATEMENT OF PUBLIC NOTICE**
- 5. STATEMENT OF CORRESPONDENCE RECEIVED**

- 6. PRESENTATION OF A REPORT BY TOWNSHIP STAFF**
 - 6.1 Staff Report from the Director of Planning and Development, Re:
Outdoor Wood Burning Furnaces.

- 7. QUESTION & CLARIFICATION PERIOD - PUBLIC**
- 8. SPEAKERS IN SUPPORT & OPPOSITION**
- 9. QUESTION & CLARIFICATION PERIOD - COUNCIL**
- 10. FINAL STATEMENT BY THE MAYOR**
- 11. ADJOURNMENT**

OUTDOOR WOOD BURNING FURNACE STUDY



TOWNSHIP OF TAY



Photo Credit - http://extension.unh.edu/Energy/Wood_Boiler.html

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1. Introduction

There have been concerns expressed about the use of outdoor wood burning furnaces or outdoor solid-fuel combustion appliance as it relates to nuisance effects from smoke and the effects on human health. The Township of Tay passed Interim Control By-law 2009-24 on the 13th day of May, 2009 to provide time to study the effects of these units in the Township and whether regulations should be put in place.

An Outdoor solid-fuel-combustion appliance is defined as an outdoor wood burning appliance or a solid-fuel-burning appliance, which is used for the space heating of buildings, the heating of water or other such purpose and which is located in a separate building or on the exterior of the building which it serves.

Outdoor Wood Boilers are not typically installed for the occasional outdoor fire, but are installed to be the main source of heat, which means they typically burn 24/7 for 6 or 7 months a year.

These units are an accessory structure or appliance designed to be located outside to provide heat, via liquid or other means, through the burning of wood, for heating spaces other than where such structure or appliance is located. They may be used for domestic heating, heating swimming pools or hot tubs and does not include a fire pits, wood fired barbecues or chimneys. They are a wood fired boiler that is typically surrounded by a water jacket, in an insulated freestanding shed and used to heat water that is carried by underground pipes to provide heat to a building.

2. Analysis

2.1 Outdoor Wood Burning Furnace Operation versus Indoor Wood Stoves:

2.1.1 Environment Canada states in their letter survey letter to the municipality that:

“Air emissions from residential wood heating, specifically particulate matter, affect air quality and are known to contribute to winter smog. In fact, residential wood heating is responsible for approximately 1/3rd of particulate matter emissions within the national inventory.

Environment Canada has been operating an air quality monitoring network for over 30 years, where residential wood heating is one of the monitored activities. Among the many types of wood heating appliances that are in use, Outdoor Wood Boilers may be an important and potentially increasing source of pollution. It has been established that an outdoor wood boiler unit emit substantially more emissions than a typical indoor wood stove unit. To put these emissions into perspective, one outdoor wood boiler emits as much fine particulate matter as 22 EPA-certified wood stoves, or 105 oil stoves or, as many as 8,000 natural gas furnaces.”

On the Environment Canada website about wood heating, they state:

“If the combustion of wood were complete, only carbon dioxide (CO₂) and water would be emitted into the air. These conditions, however, are never reached. When wood is burning, the flames appear on one part of the log while smoke arises from several areas. This smoke results from the incomplete combustion of the wood. It contains a mix of hazardous particles and chemicals that are distilled out of the wood or formed during its combustion.

The ubiquitous 55-gallon drums used by thousands of rural residents in this country to burn their garden garbage and household waste produces about 10 percent of the man-made dioxins and furans released into Canada’s atmosphere every year. In Ontario, studies show that burning garbage at home or the cottage is the fourth-largest source of dioxins and furans in the province.

Surveys of Ontario’s residents in small cities and rural areas show that almost 25 percent routinely burned their household trash in backyard barrels, fire pits and outdoor furnaces. Burning agricultural and household waste, some of which includes plastic containers, chlorine-soaked plastics and wrappings from bales of hay, offers the ideal conditions for forming dioxins and furans.”

“If you are burning garbage at home, you’re making poison,” says Environment Canada’s Bruce Gillies, who heads the team tackling the problem of burn barrels. Dioxins and furans are known carcinogens and the cause of developmental, respiratory and cardiovascular problems. In addition, the toxic compounds are also known to interfere with the immune and reproductive systems. The Canadian Environmental Protection Act, 1999 has designated dioxins and furans for “virtual elimination”.

2.1.2 Montreal Case Study:

Environment Canada undertook a study comparing the level of air pollutants in a residential area of Montreal where wood is commonly used to heat homes to levels of air pollution in the downtown.

The study shows that the concentrations of certain pollutants are significantly greater in the residential area than those recorded downtown and that the pollutant levels were much higher in the winter than the summer (more wood burning taking place in the winter). The results showed that polycyclic aromatic hydrocarbons (PAH's) are twice as high as in the downtown and five times higher than in the summer. There were 1.7 times as much dioxins and furans than in the downtown. There was a 10% increase in particulate matter 2.5 µm (PM 2.5). There were similar amounts of volatile organic compounds (VOC's) and a 40% increase in potassium, being a wood combustion tracer. Many VOC's are known to have direct toxic effects on humans.

2.1.3 The State of Washington, Department of Ecology says that:

“Most outdoor wood boilers (OWB's) employ very primitive combustion technology. When the water circulating through the furnace reaches an upper set point (usually around 180°F) the air supply to the fire is cut-off, cooling the fire so the water will not overheat. The furnace operates in this "idle" mode until the water temperature hits a lower set point and the air supply is re-established. Under some conditions, the OWB may be in idle mode far longer than in operating mode. This type of operating causes very poor combustion and heavy foul smoke. Most of the smoke emitted is fine condensed organic material that does not burn under cool, oxygen starved conditions. Burning wood with too much water content (20% moisture or less is required by state law) can also cause poor combustion. Wood from the outdoor winter wood pile may be very cold when loaded into the OWB causing an even colder fire.

One OWB can emit as much fine particle matter as four heavy duty diesel trucks on a grams per hour basis. The smallest OWB has the potential to emit almost one and one-half tons of particulate matter every year. Although older style indoor wood stoves emit more than new certified stoves, they are still several times less polluting than OWBs. Due to their poor combustion conditions, it is also probable that OWBs emit proportionately more benzene, polycyclic aromatic hydrocarbons,

formaldehyde and other toxic partial combustion products which have been linked to asthma, heart attacks and cancer.

All wood smoke is harmful. Fine particles from smoke emissions can be carried deep into the lungs and can be responsible for significant health problems, including asthma, lung diseases, heart diseases and death. These particles can also increase the risks of certain types of cancer. Breathing smoke is especially harmful for sensitive populations, including children, the elderly, and people with heart and lung ailments. It is estimated that fine particle air pollution costs citizens of Washington State hundreds of millions of dollars each year in health care costs and lost productivity due to illness.”

Outdoor wood furnaces do not burn at high enough temperatures to prevent the release of dioxins and other harmful substances. These substances go into our local atmosphere and fall into our local streams rivers and on our local crops. Not only does this contribute to global warming, but also affects our health and the health of our wildlife, most particularly the fisheries.

2.2 Court Cases and Orders:

There have been a number of court cases whereby people have taken their neighbour to court to get an order to prevent the use of outdoor wood burning furnaces. Two recent Ontario cases regarding smoke as nuisance are Scott V. Pike in Uxbridge and Deumo v. Fitzpatrick in Hamilton Ontario, both in 2008. Scott v. Pike resulted in the Judge passed an injunction preventing the neighbour from operating their outdoor wood burning furnace. The Deumo v. Fitzpatrick case was regarding a woodstove located in the garage causing excessive smoke onto the neighbours property. Like the other case, the neighbours argued that their health is compromised and their ability to enjoy their property. The courts awarded the Deumo's a total of \$100,000.00 in damages. In another case in British Columbia in 2008, the Medical Health Officer ordered the owners of an outdoor wood boiler in Kamloops to cease operation due to the acute symptoms of the neighbours consistent with known health effects of wood smoke.

Similar cases involving injunctions against outdoor wood burning furnaces include the Jackson County Health Department v. Cady in Michigan in 2009; McGrath and Snodgrass v. Durham in Pennsylvania in 1998; Thomsen v. Greve in Nebraska in 1997 whereby the Thomsen's were awarded \$4,000.00; and, Ream v. Keen in Oregon in 1992.

2.3 Existing Outdoor Wood Burning Furnaces in the Township of Tay

Township staff estimate there are approximately 15 to 20 outdoor wood burning furnaces operating in the Township. To date, all of these units appear to be in the rural area.

The Township can require a building permit for these units under the Ontario Building Code. This is at the discretion of the Township. To date, no building permits have been applied for in the Township, nor has the Township pursued this.

2.4 Township of Tay Official Plan

Section 1.2.3(c) “Introduction, Purpose” of the Official Plan states:

“1.2.3 The purpose of this Plan is:

- (c) To permit the orderly growth of the Township while correcting existing problems and safeguarding the health, convenience, and economic well-being of the residents;”*

2.5 Township of Tay Zoning By-law

The Township of Tay Zoning By-law does not currently regulate outdoor wood burning furnaces, however, there are provisions under subsection 4.16 regarding obnoxious uses which states:

“Except as otherwise specifically permitted in this by-law, no land shall be used and no building or structure shall be erected, altered or used for any purpose which is obnoxious, and without limiting the generality of this subsection, for any purpose that creates or is likely to become a nuisance or offensive, or both:

- (a) By the creation of noise or vibration; or,*
- (b) By reason of the emission of gas, fumes, smoke, dust or objectionable odour, except in the case of agricultural uses operating in compliance with The Farming and Food Protection Act; or,*

- (c) *By reason of the unsightly storage of goods, wares, merchandise, salvage, refuse matter, motor vehicles, trailers or parts of vehicles or trailers, machinery or other such material; or,*
- (d) *By any combination of these things described in clauses (a), (b), (c) of this subsection.”*

This provision could be used to pursue outdoor wood burning furnaces, however, this provision is reactive to existing furnaces and does nothing to prevent the problem before it occurs.

2.6 Severn Sound Sustainability Plan

The Sustainability Plan was developed in partnership with the nine Municipalities in the Severn Sound Watershed. This Plan has measures that allow for monitoring of things like air and water quality, etc. The intent of the Plan is to protect our economic future and the character of our area.

Severn Sound has a lot of diversity and has the largest variety of reptiles and amphibians in the province. These creatures along with fish are very susceptible to pollutants. The Township of Tay is home to 40 Species at Risk. Pollutants come from ground and storm water that flows into the streams and rivers and bays, and also from particulate matter from fires.

One of the Sustainability Plans goals is to develop a climate change action and adaptation strategy as climate change is extremely important to our area given the impact of lower water levels that evaporation from the great lakes due in part to less ice coverage.

Goal EN3 of the Sustainability Plan states to reduce consumption of natural resources. One of the strategic directions of the Plan is to take action to reduce our impact on climate change and develop adaptation strategies. One of the goals is to improve air quality within the watershed to ensure compliance with provincial air quality standards. Communities within the watershed are moving toward this goal for which we all benefit. For example, the City of Orillia has an Anti-idling By-law and the Town of Midland has an anti-idling policy for municipal vehicles to assist in decreasing the amount of carbon dioxide emitted.

2.7 Georgian Bay Biosphere Reserve

For Committees information, the area of Georgian Bay stretching from the Severn River to the French River has been designated by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as one of 500 Biosphere Reserves in the world and only one of 13 in Canada. Tay Township borders on this reserve and therefore we have an impact on the health of this Reserve.

The Georgian Bay Biosphere Reserve is considered the world's largest freshwater archipelago.

This biosphere covers 347,000 hectares of shoreline ecosystem containing over 100 species of animals and plants that are at risk in Canada and Ontario, including unique reptiles and amphibians.

3.0 Planning Recommendations

The following options were considered in regard to outdoor wood burning furnaces:

1. Do nothing.
2. Total prohibition.
3. Regulate these units.

As the Township of Tay Zoning By-law does not currently regulate these systems, the do nothing option would rely on the existing Noxious Uses section of the By-law. This option would be reactive through complaints, the municipality may pursue a smoke related concern coming from an existing outdoor wood burning furnace. This option would be the more expensive of the options for all parties as it requires By-law enforcement and court proceedings after the unit has been purchased and installed, and may result in the relocation or removal of the unit having a financial impact on both the municipality and the owner of the unit.

Total prohibition is one of the options suggested by Environment Canada and has been adopted by some municipalities. Environment Canada has advised that they are working on revisions to the Environmental Protection Act that may result in regulations or prohibitions of outdoor wood burning furnaces.

Changes to the Zoning By-law to create some regulation of these units is the third option. There are a number of items this option could include such as restricting the use of outdoor wood furnaces to rural and agricultural lands which are generally larger; separation distances from the unit to the lot line, minimum height restrictions for chimneys to aid in dispersing smoke; regulations on the quality of the unit to be certified by CSA or the EPA.

Regulations in the Zoning By-law is a step toward reducing the immediate negative effects of outdoor wood burning furnaces for neighbours. However, provided that these units are operated, there will still be negative effects to the environment. These units do not burn at the high temperatures that an EPA certified non-catalytic woodstove burn. With proper operation, EPA certified non-catalytic woodstoves burn clean enough to produce no smoke. Outdoor wood burning furnaces, have not yet been able to achieve this high level of clean burning resulting in particulate matter being dispersed in the air, fall onto crops and into streams and rivers and into the food chain.

Regulations under the Zoning By-law will not however, provide immunity for owners from court cases that may result in the owner having to no longer use or remove their unit or from paying damages. The only action that would give the owner immunity, is for them not to install an outdoor wood burning furnace in the first place, or a total prohibition on these units. Until that option is considered by the Township of Tay, the regulation option is recommended with the following provisions:

An outdoor solid-fuel-combustion appliance is only permitted in Rural and Agricultural Zones in accordance with the following provisions:

- (a) Not more than one (1) outdoor solid-fuel-combustion appliance per lot accessory to a permitted main use;
- (b) The outdoor solid-fuel-combustion appliance can not be located closer than 45 metres to any lot line;
- (c) The outdoor solid-fuel-combustion appliance can not be located closer than 15 metres to any building;
- (d) The outdoor solid-fuel-combustion appliance must be fitted with a chimney no less than 3.6 metres in height from ground and must be equipped with a rain cap/spark shield.

- (e) That the perimeter around the outdoor solid-fuel-combustion appliance to a distance of 3 metres from the unit shall remain free from any combustible material.
- (f) Outdoor solid-fuel-combustion appliance must bear a certification mark certifying conformity with the Canadian CSA standard and/or US EPA standard.
- (g) Outdoor solid-fuel-combustion appliances shall be maintained so as not to cause a nuisance for more than two minutes in succession except during the starting or refueling of the appliance for a period not to exceed thirty minutes in any four-hour period.
- (h) Notwithstanding the provisions of Sections 4.12 “Legal Non-complying Building and Structures” any replacement of an outdoor solid-fuel-combustion appliance must meet the provisions of this By-law.

It is also recommended that in a building permit be required for all new installations to ensure the zoning regulations are met. Any existing installations could be considered legal non-complying. If, however, a new installation is to be undertaken, through the above proposed regulations the Township can require that it meet the new criteria.

4.0 Summary

Outdoor solid-fuel-combustion appliances are polluters in our environment. In the absence of regulations by the Province of Ontario at the time of this Study, the Township can require that these units meet certain standards in order to reduce the incidence of nuisance and negative health effects to the Township of Tay residents and pollution of the environment. Therefore it is recommended that the Township undertake a planning process to establish regulations for outdoor solid-fuel-combustion appliances in the Township of Tay Zoning By-law.

THE CORPORATION OF THE TOWNSHIP OF TAY
BY-LAW NUMBER 2009-__

*"Being a By-law to amend Zoning By-law 2000-57 regarding
outdoor solid-fuel-combustion appliances"*

WHEREAS, By-law Number 2000-57 is the General Zoning By-law of the Corporation of the Township of Tay;

WHEREAS, in June 2000, the Canadian Council of Ministers of Environment (CCME), adopted the Canada-wide Standards for Particulate Matter (PM_{2.5}) and Ozone;

WHEREAS, governments have committed themselves to significantly reduce PM_{2.5} and ground-level ozone by 2010 to comply with these standards;

WHEREAS, research indicates that wood smoke is a significant contributor to PM_{2.5} levels, which pose significant health risks;

WHEREAS, the Township of Tay desires to lessen the risk to life and property from air pollution from outdoor solid-fuel-combustion appliances; and

WHEREAS authority is granted pursuant to Section 34 of the Planning Act, R.S.O. 1990, c.P.13, as amended, to enact such amendments to the General Zoning By-law;

NOW THEREFORE be it enacted as a By-law of the Corporation of the Township of Tay the following:

1. Subsection 3.2 "Definitions" be amended by adding the following definition and the remaining definitions be renumbered accordingly:

"3.2.152 Outdoor Solid-fuel-combustion Appliance shall mean an outdoor wood burning appliance or a solid-fuel-burning appliance, which is used for the space heating of buildings, the heating of water or other such purpose and which is located in a separate building or on the exterior of the building which it serves and for the purposes of this definition:

- (a) "Solid fuel" means wood or any other non-gaseous or non-liquid fuel.
- (b) "Wood burning appliance" means a solid fuel burning device including, without limitation, a stove, a fireplace, or any similar device."

2. Subsection 4.1 “Accessory Buildings, Uses and Structures” be amended by adding the following article:

“4.1.12 Outdoor Solid-fuel-combustion Appliances

An outdoor solid-fuel-combustion appliance is only permitted in Rural and Agricultural Zones in accordance with the following provisions:

- (i) Not more than one (1) outdoor solid-fuel-combustion appliance per lot accessory to a permitted main use;
- (j) The outdoor solid-fuel-combustion appliance cannot be located closer than 45 metres to any lot line;
- (k) The outdoor solid-fuel-combustion appliance cannot be located closer than 15 metres to any building;
- (l) The outdoor solid-fuel-combustion appliance must be fitted with a chimney no less than 3.6 metres in height from ground and must be equipped with a rain cap/spark shield.
- (m) That the perimeter around the outdoor solid-fuel-combustion appliance to a distance of 3 metres from the unit shall remain free from any combustible material.
- (n) Outdoor solid-fuel-combustion appliance must bear a certification mark certifying conformity with the Canadian CSA standard and/or US EPA standard.
- (o) Outdoor solid-fuel-combustion appliances shall be maintained and operated so as not to cause a nuisance for a duration of more than two minutes except during the starting or refueling of the appliance for a period not to exceed thirty minutes in any four-hour period.
- (p) Notwithstanding the provisions of Sections 4.12 “Legal Non-complying Building and Structures” any replacement of an outdoor solid-fuel-combustion appliance must meet the provisions of this By-law.”

3. This By-law shall take force and come into effect pursuant to the provisions and regulations made under the Planning Act, R.S.O. 1990, c.P.13.

THIS BY-LAW read a **FIRST, SECOND,** and **THIRD** time and finally **PASSED** this ___th day of _____, 2009.

THE CORPORATION OF THE TOWNSHIP OF TAY

MAYOR Scott Warnock

CLERK Alison Thomas