

CARP ROAD LANDFILL ODOUR REPORT (to the end of 2007)

Although landfill gas is primarily made up of methane and carbon dioxide which are both odourless gases, minor components of landfill gas such as hydrogen sulfide and mercaptans contribute to the disgusting odours associated with landfills. These odour causing gases are generally thought to have little health concerns when in small amounts but can trigger a sense of nauseous or allergic reaction. There are other minor components of landfill gas such as benzene which have little odour but are much more hazardous to health. The smell of landfill gas is often considered to be a cause of concern as the more hazardous gases may also be present and in concentrations that may have effect on the health of those who are smelling the landfill gas. Also there has been little study of the effects of long term exposure and the interaction between the many different gases that are found in landfill gases. Landfill odours also come from other materials such as leachate, biosolids, contaminated soil. As well operational activities such as well drilling, trenching and road building that disturb cover on the mound can produce landfill odours.

Although the Carp Road landfill has been in operation since 1971, odours have only become a problem in the last ten years or so. This is probably because of the increased size of the operation, the amount and type materials being processed at the site and the length of time materials have been decomposing. An example of this was the odour problems associated with the processing of bio-solids from the Ottawa sewage plant in the 1990's.

Odour from the Carp Road landfill has been an increasing problem for local citizens over the past 3 to 5 years. Although this increasing odour problem was having an adverse affect on the people living near the landfill there were few registered complaints. There are several reasons for this limited complaint reporting. First, most people did not know how and who to complain to. Contacts for Waste Management and MOE were not well advertised. Secondly, most people knew the landfill had limited capacity left and understood that it would be closing soon, thus they thought the odour problem would go away when it closed. Thirdly, most people were willing to be good neighbours and put up with some inconvenience from the landfill operation. However within the last couple of years the level and extent of landfill odour have reached a point where many people can not enjoy their property and neighbourhood. An example of this is that many people are taking alternate routes through the community to avoid the landfill odour and they are telling friends and visitors to do the same.

The release of the draft terms of reference for an expansion EA (Jan. 2006) gave people guidance on who odour complaints should be sent to and how they should be done. This lead to an increase in odour complaints to MOE and a realization of the growing problem. Throughout the Spring, Summer and Fall of 2006 odour became an ever increasing problem with many people not able to enjoy being outside at their property or

in their community. As a result of this increasing odour problem the number of odour complaints also increase.

The problem reached such a level that in the summer of 2006 the community decided to start a database of odour complaints so that the intensity, frequency and distribution of landfill odour could be tracked. The following report presents the results of the odour tracking up to the end of 2007.

In total 6030 odour complaints have been recorded in the community database to the end of 2007. Figure 1 shows the monthly distribution of complaints and the number of days in the month that complaints were recorded.

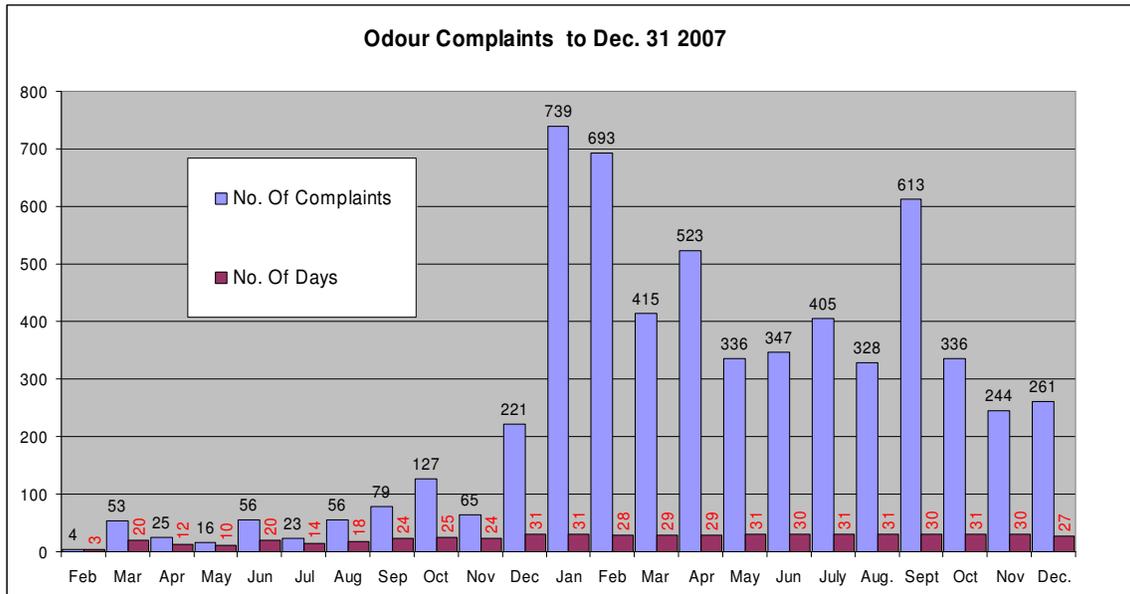


Figure 1.

There is an obvious trend towards an increase in the number of days when people detecting odours in the neighbourhood and the total number of complaints registered. There are two reasons for this. First, there has been an increasing problem with landfill odours. Second, increased public awareness of the reporting process both of which have lead to more people reporting odour problems. Often these people report that it is their first complaint but they have been smelling the landfill for a long time or were not sure what the source of the odour was. One could conclude from this that there would have been more complaints earlier in the reporting period than show in figure 1. The pattern in Figure 1 also illustrates the fact that formal online reporting was initiated on the NoDump.ca website in December 2006.

The data in the complaints database were used as an input to a GIS spatial analysis complaint distribution and odour plume in the community. The methodology used to map the odour plume was as follows.

1. Odour complaints are listed in an Access database with the following attributes; (name, address, date, time, duration, wind direction, description/intensity, location and comments). It includes data provided by MOE.
2. A 1Km.x1Km. grid was developed for the study area. (figure 2) covering 342 Sk. Km.
3. Complaint occurrences were assigned to the grid cells in which they occurred.
4. One odour complaint was assigned to each of the two grid cells over the landfill itself (odour source) for each day that odours were reported.
5. The grid cell centriods were used to prepare a contour map of the occurrences showing the number of complaints per square kilometer.

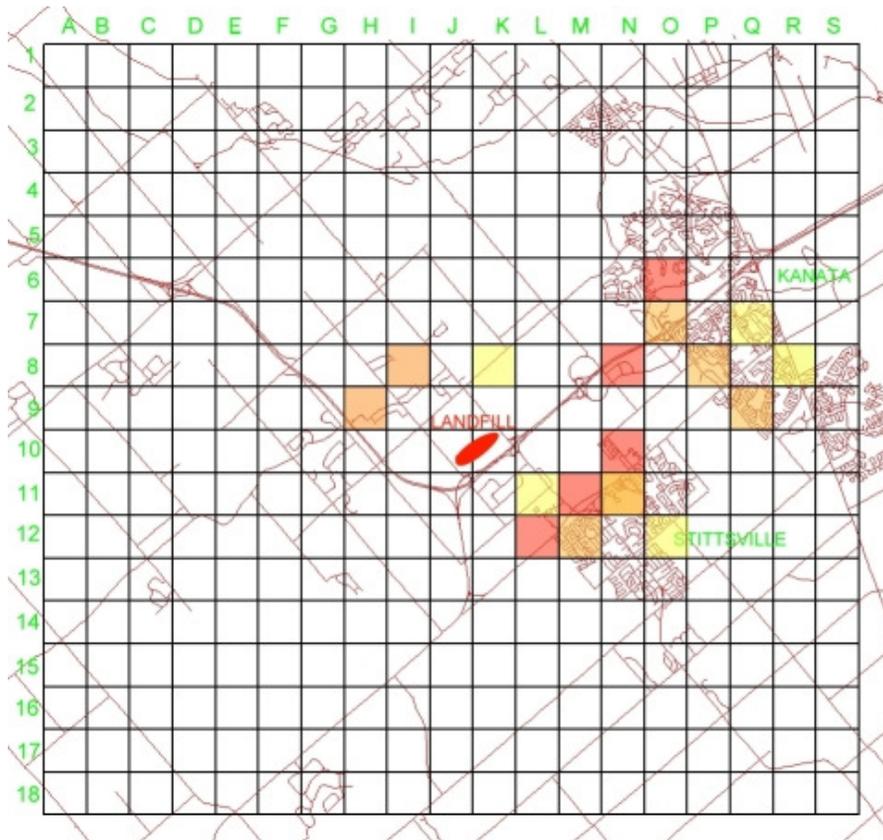


Figure 2

Odour plume mapping was updated several times as new data were added to the complaints database. Cumulative mapping to the end of 2006 (Figure 3) validates the data as authentic in a number of ways. First, the odour plume tends to extend in the direction of the prevailing winds which are mostly Northwesterly in the winter and West to Southwest in the summer. Second, there are holes in the mapped area where few or no people live, work or travel. Third, the number of complaints are higher closer to the landfill than at further distances.

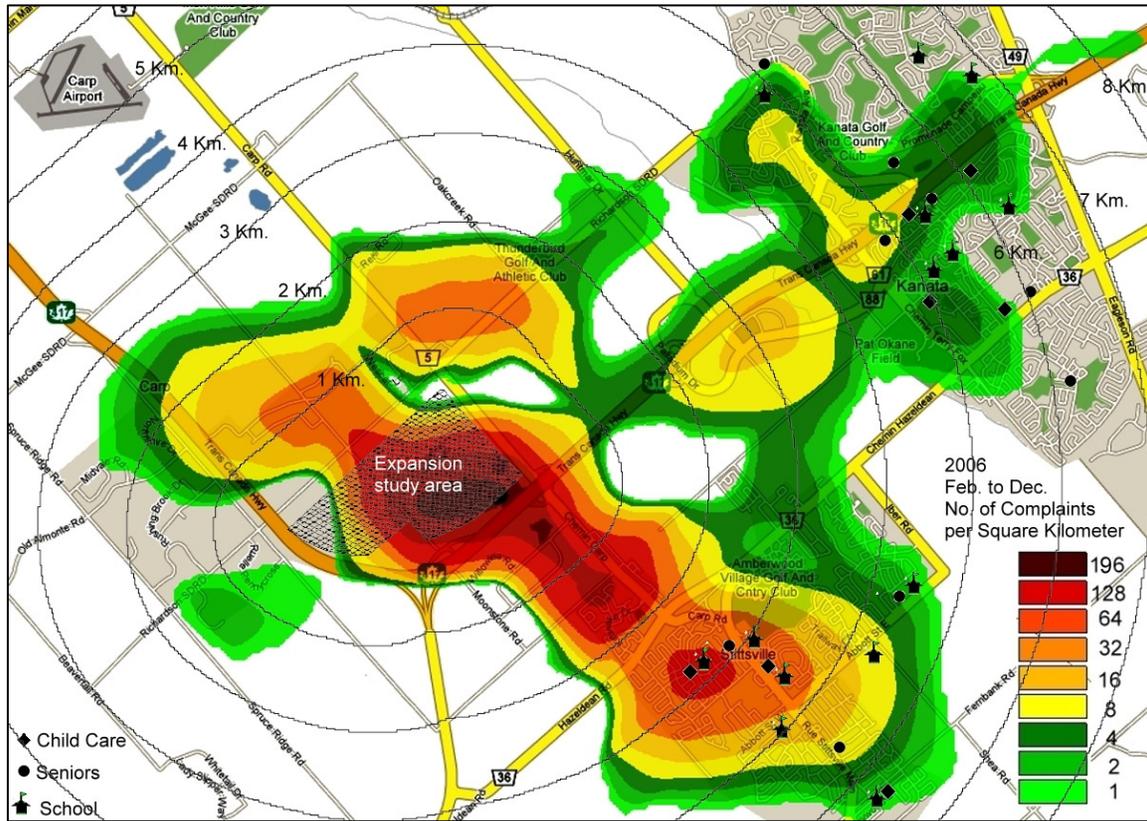


Figure 3

Figure 3 also shows the location of important community centers such as schools, child care centers and seniors homes. In all there are 13 schools in the odour plume, 7 child care centers and 7 seniors homes. As is evident in figure 3 several schools and child care centers are located in high odour zones. Distance lines on figure 3 shows that the odour plume in 2006 extends up to 7 Km. from the landfill and the proposed expansion study area. (note there are a number of complaints located outside the 7 Km. radius). Correlation of the odour plume with 2005 population distribution shows that there are between 25,000 and 30,000 people within the odour plume and are affect to varying degrees. It should also be noted that areas of future housing and commercial development such as Kanata West, Jackson Trails (now under construction), Fair Winds (now under construction), Arcadia and Fernbank are also in the odour plume.

Figure 4 shows the distribution of odour complaints for 2007.

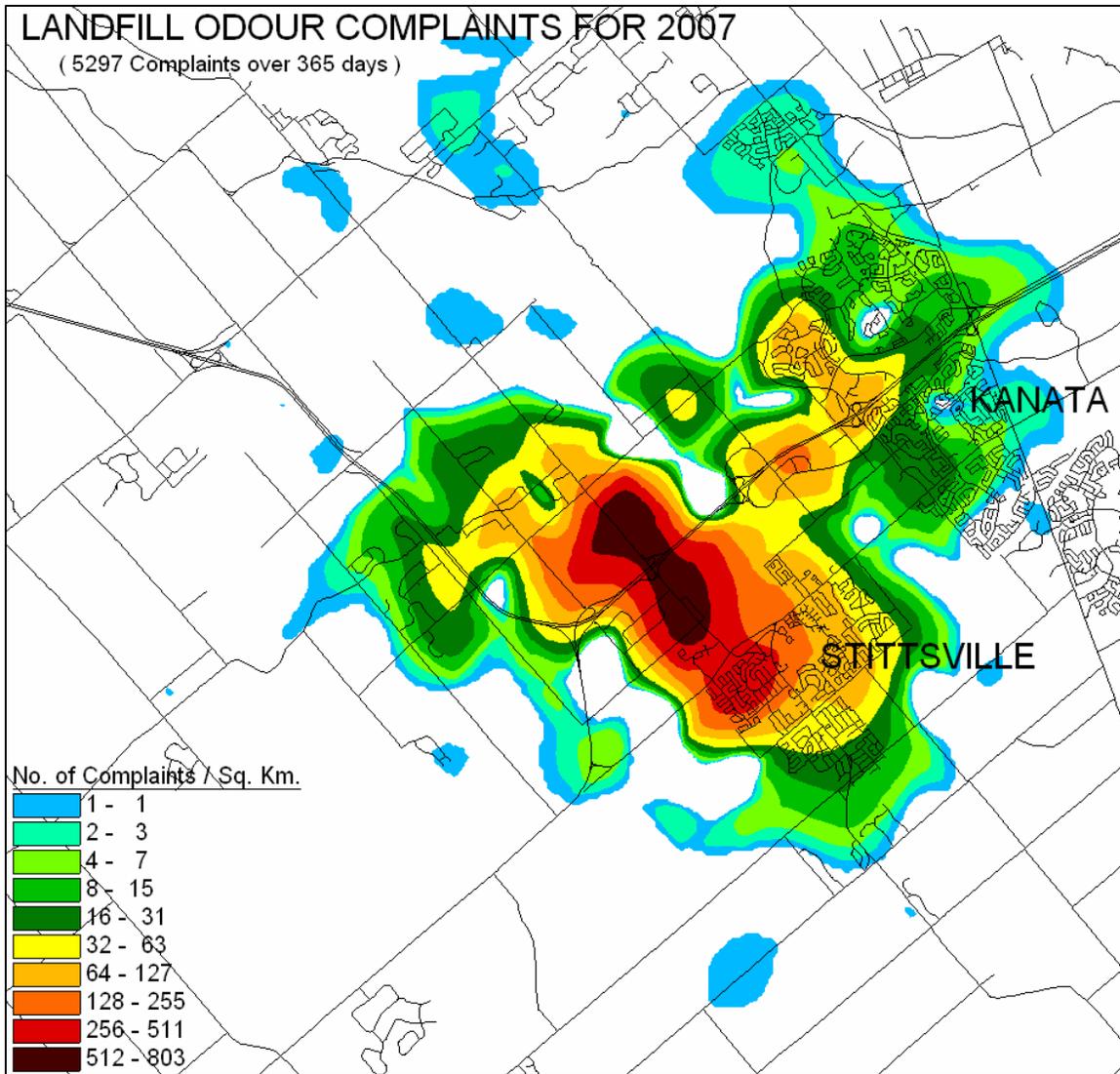


Figure 4:

The source of complaints is an important attribute to be studied. An odour report from a residential address is very important as it is where people live and spend most of their time. Also ones home is the most expensive investment people make in their live and thus they want to protect it. They also want to enjoy their property both inside their homes and outside in their property. The second most important type of odour complaint comes from non-residential addresses. These are locations in the community where people shop, work and go to school. And finally there are complaints that come from people that are driving through the community. This maybe when they are commuting to work every day or it maybe when they go to local community events or do their weekly shopping. It maybe when they go out for entertainment or take their children to school or athletic activities. It maybe when they go out for an evening walk in the community. Although these events maybe be short in duration they can interfere with the enjoyment of the community.

Figure 5 shows the break out of the odour complaint sources.

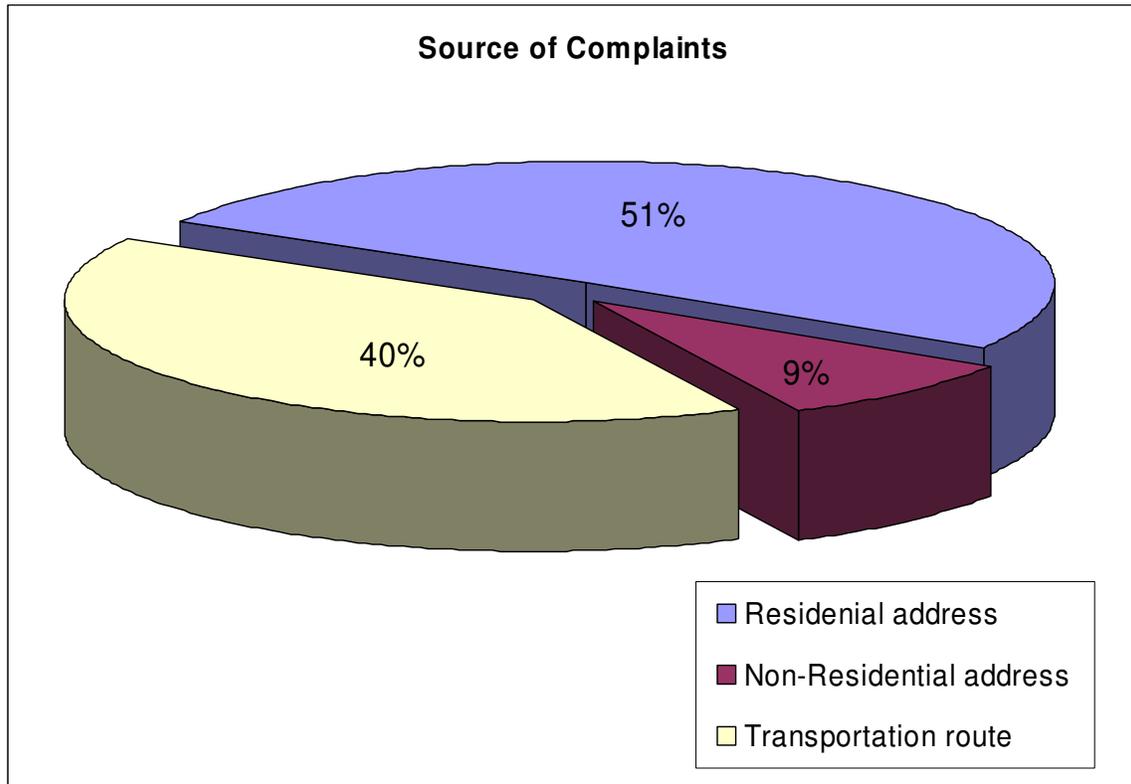


Figure 5.

Waste Management has made many efforts to control and eliminate odour problems in the community. (extra flare capacity, more landfill wells to extract landfill gases, better cover, and air misting system) in total many millions of dollars have been spent on odour abatement. All of the data in the community odour database and the analysis present here indicates that odour abatement programs have not eliminated the odour problems. This has been confirmed by odour surveys carried out by MOE in Feb. Sept. and Oct. 2007 and by RDWI (for Waste Management) in Feb. Apr. Sept. and Oct. 2007. The community continues to suffer odour problems, and all the health, social and economic negative impacts that go with them.