

# Sample I/I Sources found by Thompson Flow Investigations

## *Some Typical & Some Unusual*

1. Below grade driveways leading to basement garages with the catch basin connected to the sanitary sewer. These have been found on several occasions and can represent 1000 sq. ft. of directly connected impervious area each. The solution is to properly connect the catch basin to the storm sewer or utilize a pump on the catch basin with discharge to an appropriate location.



2. Roofs with downspouts draining directly to the sanitary sewer. These have often been found and disconnection with discharge to an appropriate location is the solution. In some cases a shallow pipe leading to a swale or the curb is used as an outlet (pipe can have heat tracing in it).



3. Street catch basins connected to the sanitary sewer. In one case we found a sewer manhole (end of line, 300mm pipe) where the top had been removed, replaced with a catch basin top and used to drain about 150m of a 4 lane highway. An auto service centre parking lot was also connected to this manhole. The highway owner was prevailed upon to correct their drainage system.

4. Storm sewer lids on sanitary manholes located in road gutter. In one study we found that when a subdivision was built, open grid storm sewer lids had been used on sanitary manholes and closed grid lids on storm sewers (ie. Lids were mixed up). About 12 of these were located in the road gutter and some were also in line with paved driveway runoff. Simply switching the lids resulted in a significant decrease in I/I.

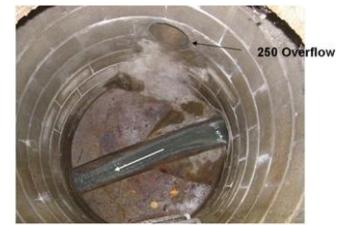


5. A poorly graded ditch, partly blocked with rubble which was directly over a cracked sanitary sewer. This area had experienced frequent sanitary sewer flooding for many years. The suspect source was located by detailed flow monitoring & analysis followed by lot inspections, dye testing and discussions with residents. It was confirmed by dye testing and corrected by a public works crew regrading about 10m of ditch. Subsequent flow monitoring showed that response to rainfall from this area was almost completely eliminated.



6. A wooden manhole in a northern Ontario mining community which lay in an intermittent stream bed and had a rotted top. When Larry Thompson found it the stream was flowing heavily with it's entire flow entering the manhole. This community had experienced recurring Spring basement flooding and had constructed an illegal overflow about 500m long to discharge to a wetland. The solution was to build a concrete manhole and divert the intermittent stream about 3 m to one side.

7. An overflow pipe from a sanitary sewer to a storm sewer which worked in reverse. A 250mm sanitary sewer had an overflow pipe to an adjacent 525mm storm sewer. The storm sewer was designed for a 5 year storm and when several events much larger than that occurred, it surcharged and overflowed to the sanitary sewer quickly surcharging it and flooding basements of numerous homes.



8. A trunk sewer manhole which was being used to drain an industrial parking lot. The manhole lid had been removed and a pile of pallets and carpet ends placed over it to hide it. The solution was to install a locking, gasketed manhole lid.

9. A sanitary sewer manhole in a river valley which had been completely exposed as the river moved within it's floodplain. When found by Mr. Thompson the manhole was well out into the active stream and had been partially knocked over by a large tree trunk (which was still there, looking like a medieval battering ram).The solution was to eliminate and seal up the manhole.



10. A broken, shallow sewer line in a floodplain. The ground above the sewer had fallen in to it exposing the sewer as it crossed a floodplain area. Whenever a nearby creek flooded this field, massive inflow to the sanitary sewer occurred.



11. Trunk sewer manholes being used for land drainage on a golf course. A few locations were found where holes(hidden by grass) had been created in the manhole sides to receive drainage from shallow swales. Trunk manholes are now inspected annually to catch and prevent such modifications .

12. Trunk sewer manholes in a deep ditch alongside a highway. A row of such manholes were found which became overtopped during spring snowmelt and also had extreme inflow through their cracked adjusters. Another nearby manhole in a field was flooded in the spring even though it was about 30cm above ground. These manholes were all extended above flooding levels and sealed. Very significant reductions in spring period I/I were then observed at the downstream sewage plant.



MH 8-223 APRIL 4, 1991 SULLIVAN ROAD STREET ALLOWANCE  
MELT WATER HAS BUILT UP AND IS FLOWING INTO MH.  
(MELT WATER OVER 300mm DEEP)



MH 8-260 & MH 8-259 HIGHWAY 144  
MANHOLES IN DITCHLINE CAN BE OVERTOPPED DURING HEAVY STORM FLOWS