

2 PROBLEM AND OPPORTUNITY IDENTIFICATION

2.1 General

Urban areas may degrade the environment in many ways. Degradation may occur at the onset as lands are stripped during the construction process. This commonly results in excessive sediment loads being discharged to the receiving bodies of water.

As development of an area progresses, pollutant loadings from the urban area become significant. Common sources of pollutants include heavy metals from automobiles and air emissions, nutrients from fertilizers, bacterial contamination from human (combined sewer overflows) or animal (stormwater runoff) wastes and toxic contaminants from a variety of residential, commercial and industrial sources. **Table 2.1.1** shows concentrations of selected constituents of stormwater runoff (City of Toronto) compared to the Provincial Water Quality Objectives (PWQO) (Aquafor, 1993).

Table 2.1.1: Comparison of Urban Stormwater Runoff Concentrations with Various Water Quality Criteria

Parameter	Units	PWQO	Observed Concentrations
E. Coli	CNT/100ml	100	100-160,000
Suspended Solids	mg/L	-	87-188
Total Phosphorus	mg/L	0.02	0.3-0.7
Phenolics	mg/L	0.001	0.014-0.019
Lead	mg/L	0.025	0.038-0.055
Copper	mg/L	0.005	0.045-0.46
Zinc	mg/L	0.030	0.14-0.26
Cadmium	mg/L	0.0002	0.001-0.024

The pollutants, when conveyed to the receiving bodies of water, impact the environment in many ways. The particulate (settleable) and dissolved contaminants stress aquatic ecosystems by depleting oxygen, raising ambient water temperature, covering habitat or through the bioaccumulation or bioconcentration of contaminants in the tissues of various aquatic species.

Urban development of the lands draining to the streams also results in a transformation of the hydrologic characteristics within the subwatershed (see **Figure 2.1.1**). Large amounts of

previously permeable soils, which allowed rainwater to soak into the ground, are covered with impervious materials such as concrete and asphalt. Rainfall events that previously contributed little or no runoff to the stream now cause flow to occur in the channel. Consequently, the amount of water draining to the stream increases significantly in volume.

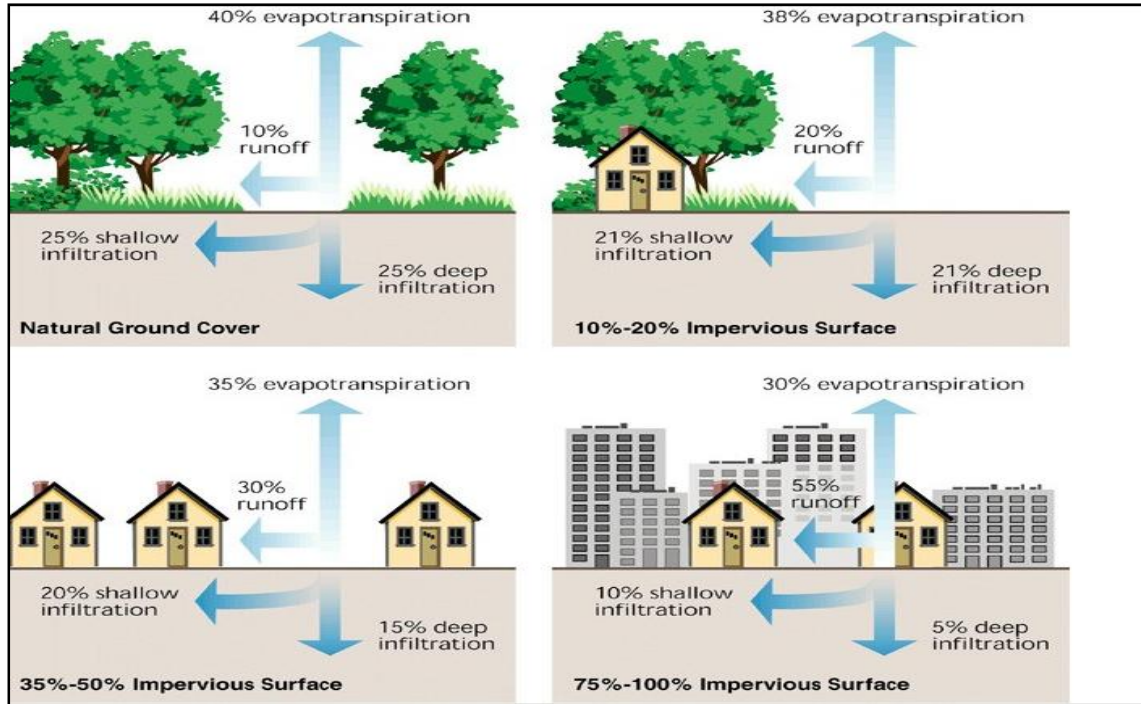


Figure 2.1.1: The Impact of Conventional Urbanization on the Hydrologic Cycle

Commensurate with the increase in the amount of runoff is a decrease in the amount of water that infiltrates into the ground. This may result in an adverse impact to existing wells due to the resultant drop in the water table.

Rural areas may also degrade the environment as a result of increased bacterial, nutrient and suspended solids loadings from farms, golf courses and nurseries.

As a result existing land uses, together with proposed land use changes, a number of potential environmental problems have been identified. These include:

1. Degraded water quality
2. Adverse effects on human and animal health
3. Loss and degradation of fish and wildlife habitat
4. Surface flooding and erosion
5. Reduction in groundwater recharge