10.2 Uses

10.2.1 Introduction

The use of storage facilities for stormwater management has increased dramatically in recent years. The benefits of storage facilities can be divided into two major control categories of quality and quantity.

10.2.2 Quality

Control of stormwater quality using storage facilities offers the following potential benefits:

- decrease downstream channel erosion
- control sediment deposition
- improve water quality through stormwater filtration (wet ponds only)

10.2.3 Quantity

Controlling the quantity of stormwater using storage facilities can provide the following potential benefits:

- prevention or reduction of peak runoff rate increases caused by urban development
- mitigation of downstream drainage capacity problems
- recharge of groundwater resources
- reduction or elimination of the need for downstream outfall improvements
- maintenance of historic low flow rates by controlled discharge from storage

10.2.4 Objectives

The objectives for managing stormwater quantity by storage facilities are typically based on limiting peak runoff rates to match one or more of the following values:

- historic rates for specific design conditions (i.e., post-development peak equals pre-development peak for a particular frequency of occurrence)
- non-hazardous discharge capacity of the downstream drainage system
- a specified value for allowable discharge set by a regulatory jurisdiction

10.2.5 Downstream Effects

An estimate of the potential downstream effects (i.e., increased peak flow rate and recession time) of detention storage facilities may be obtained by comparing hydrograph recession limbs from the pre-development and routed post-development runoff hydrographs.

Potential effects on downstream facilities should be minor when the maximum difference between the recession limbs of the pre-developed and routed outflow hydrographs is less than about 20%. **However, it is important to be aware that the increased total volumes of water being released slowly over a longer period of time may contribute to bed and bank decay in the receiving channel**.