Table 4.3. Characteristics of the nonaggressive pipe cleaning methods.

	Flushing	Air scouring	Swabbing
Pipe sizes	Up to 150 mm in high-pressure areas	Up to 200 mm	Normally up to 1000 mm
Plant and materials	Hoses for disposal of large water volumes	Air scouring rig and compressor	Swabs, swab locators
System modifications	Existing hydrants usually employed	Additional hydrants, valves and injection points may be needed	Insertion points on larger pipes
Comments	Of limited use in low-pressure areas, potential to create extensive disturbance that may not be removed via flushing hydrant	More effective than flushing and can be used in low-pressure areas	Blockages may occur if swab lost

Sources: WRc (1994), Stephenson (1989).

4.4.2 Flushing

Flushing involves the discharge of water from pipes, generally through hydrants and washouts, to generate velocities in the pipe capable of removing accumulated material and biofilms inside the pipe and attached to its walls. This is the simplest of the pipe-cleaning techniques. The velocity required to suspend and flush out the deposits depends on particle size and specific gravity. Although most small animals are of low specific gravity (about 1), inorganic deposits may have a specific gravity of up to 3. Table 4.4 provides the volumetric flow rates required to transport loose particles of 0.2 mm diameter. Below this diameter, the minimum flow rate required falls quickly with particle size. Above this diameter, the effect of flushing diminishes rapidly.

Table 4.4. Flow rate required to suspend and transport solids of 0.2 mm particle size in water mains.

Pipe diameter (mm)	Flow rate (l/s) for specific gravity 1.5	Flow rate (l/s) for specific gravity 3.0
50	1.5	2.7
75	3.8	7.2
100	7.6	15.0
150	20.0	41.0
200	42.0	83.0

Source: Stephenson (1989).