MINNESOTA DEPARTMENT OF PUBLIC SAFETY
State Fire Marshal Division

STATEMENT OF POLICY

Policy #: FP-02 (2007)	Subject of Policy: Water Supplies for Fire Protection Systems		
Reviewed and Approved By: Jerry Rosendahl	Title: State Fire Marshal	Effective Date: July 10, 2007	Revision Date: July 10, 2007

APPLIES TO:
All Deputies, All Fire Sprinkler Contractors, All Fire Sprinkler Designers.

PURPOSE: Standardization of water supply requirements for Automatic Sprinkler Systems reviewed by the State Fire Marshal Division.

WATER SUPPLY POLICIES

The following list contains the policies of the State Fire Marshal Division concerning fire sprinkler systems. The list is not all-inclusive. Unique situations can be reviewed on a case by case basis.

A) Double backflow prevention is only required by the State Plumbing Code when there is a risk of cross-contamination with a non-potable source (i.e. lake, pond, etc.). The local authority having jurisdiction may have requirements that are more restrictive and they should be consulted prior to the request for permit.

B) The State Fire Marshal Division will approve a combined domestic/fire service line when the size of the domestic connection does not exceed one-fourth the size of the combined service line, **or** the domestic water demand is added to the sprinkler water demand at the point of connection and hydraulically proven to the municipal street main.

If neither condition is attainable, a normally open electric solenoid valve, wired to receive a signal to close from the sprinkler system water-flow device, shall be provided on the domestic connection.

C) Water flow data used for hydraulically designed fire protection systems shall be less than three (3) years old*. Consideration shall also be given to conducting additional water flow tests in certain situations even though the tests are less than three (3) years old, (Example: systems in rapidly developing areas or industrial areas with high water usage) [NFPA 13 (2002 edition), 15.2.1].
*When an existing fire pump is the primary source of supply, a copy of the fire pump test no more than one year old shall be provided in the submittal package. The system design shall be based on the actual pump test plus the city supply pressure and flow, adjusted for the system demand, at the pump's discharge flange.

D) Acceptable water supplies for fire sprinkler systems are listed in NFPA-13 (2002 edition), Chapter 15. Sprinkler systems shall be connected to at least one reliable automatic water supply [NFPA13, (2002 edition) Section 15.1.1]. Swimming pools, ponds and fire department connections are not acceptable as a reliable automatic water supply.

E) Pressure, storage and gravity tanks shall be sized per the requirements contained in NFPA-13 (2002 edition) and NFPA-22 (2002 edition) for the **actual calculated sprinkler system demand**. Duration of the water supply shall match the hazard classification of the overall occupancy classification. Water storage tank configurations shall be acceptable to the authority having jurisdiction.

F) The following are requirements contained in NFPA-291, (2002 edition), concerning performance of water flow tests*:

- It is generally recommended that a minimum residual pressure of 20 psi be maintained at the hydrants when delivering the fire flow. See NFPA-291 (2002 edition), Sec. 4.1.3.

- Test should be made during a period of ordinary demand and adjusted for seasonal changes.) See NFPA-291 (2002 edition), Sec. 4.2.1.

- To obtain satisfactory results of theoretical calculation of expected flows or rated capacities, sufficient discharge should be achieved to cause a drop in pressure at the residual hydrant of at least 25 %, or to flow the total demand necessary for firefighting purposes. See NFPA-291 (2002 edition), Sec. 4.3.6.

*In any case, the water flow test must reflect **at least** the theoretical demand of the most demanding sprinkler zone, plus the required hose allowance.

G) Weak municipal systems
When the municipal water supply that feeds the sprinkler system is marginal, MSFC (07) Section 903.3.1.6.1 would allow the chief to modify the water supply requirements for the hose streams. The required water demand for sprinkler operation must still be met. This exemption should only be allowed with the approval of the local chief with the understanding that an alternate water supply is available for fire hose streams (e.g. tanker, dry hydrants, ponds, lakes).

H) Pumps, wells and tanks
There is support to modify the hose streams with pumps, wells and tanks in NFPA 13 (2002 edition) Section 11.2.3.1.8 (H) that states, " Where pumps, gravity tanks, or pressure tanks supply sprinklers only, requirements for inside and outside hose streams need not be considered in determining the size of such pumps or tanks."

Typically, rural fire departments (and those without municipal water supplies) carry their own water supply in tanker trucks; utilize dry hydrants in lakes or ponds, etc… The sprinkler system would have its own dedicated water supply and activate early in the fire situation. By design, the sprinkler system is intended to control the fire until the fire department arrives. The deletion of inside / outside hose requirements in this case does not seem unreasonable.

RATIONALE:

One problem, especially in rural areas, has been the adequacy of the water supplies that feed the fire sprinkler systems. MSFC (07) Section 903.3.1.6.1 permits the chief to modify the sprinkler hose streams demand provided an adequate alternate water supply is available.