APPENDIX C

RECOMMENDATIONS AND IMPLEMENTATION

PLANS OF THE WATER SUPPLY STUDY

IMPLEMENTATION WORK GROUP

WATER SUPPLY RECOMMENDATIONS
"LEGISLATIVE ISSUES" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

1. The MCFRS should initiate actions necessary to introduce legislation to mandate the installation of quick-response, residential sprinklers in new single-family detached dwellings, and the retrofitting of existing high-rise apartment buildings as required by the Life Safety Code.

WSSIWG Comments:

Enacting this legislation and implementing its provisions will save lives, reduce property damage, lower insurance premiums, and reduce the demand on fire suppression water supply requirements. Several municipalities in the United States, including Prince Georges County, have similar ordinances in place and have realized these significant benefits. Bill 3-00, presently under consideration by the Montgomery County Council, would offer tax-reduction incentives to those residential property owners (not presently required to install sprinkler systems) who voluntarily install sprinkler systems after July 1, 2000. This legislation is a positive step towards an ultimate goal of mandating sprinkler systems for single-family detached dwellings and the retrofitting of high-rise apartment buildings.

Impacts:

1. Ease of implementation:

Implementation of this recommendation could be a difficult process due to anticipated opposition from homebuilders associations, high-rise building owners, and possibly prospective homeowners who intend to build or purchase new single-family dwellings in Montgomery County. This opposition would be based, primarily, upon cost issues. The key to enacting and implementing this legislation will be two-fold:

- A successful public education program initiated by the MCFRS, in partnership with organizations that promote residential sprinklers (e.g., National Fire Sprinkler Association, Residential Fire Safety Institute, Home Fire Sprinkler Coalition, etc.).

- A successful campaign to counteract the anticipated arguments against residential sprinklers by homebuilders associations and other potential opponents.

2. Fiscal:

Property owners would bear the costs of installation and associated permits. The demand for MCFRS acceptance testing of new systems will increase, necessitating the need to hire additional Code Enforcement personnel. There may also be a fiscal impact on the Department of Permitting Services, who would be processing many additional sprinkler system permits.

3. Legislative:

Legislation would be required to establish and implement the provisions of this recommendation. The process could be lengthy and difficult (see "Ease of Implementation" above).

4. Policy/procedures:

Implementation of this recommendation should not require new policies and procedures; however, due to the major risk reduction impact of this legislation and the shifting of greater fire protection responsibility to the property owner, an amendment to the *Fire, Rescue, and Emergency Medical Services Master Plan* would be in order.

5. Geographical:

The provisions of this recommendation would apply county-wide. In particular, the forthcoming development in the Clarksburg area affords an excellent opportunity to implement the provisions of this recommendation and realize the benefits throughout the community. Although the development of the Kingsview Village portion of Germantown is well underway, a sprinkler requirement for new single-family dwellings would positively impact this community in terms of homes built during mid and latter stages of the overall development.

Implementation Timeline:

For the reasons stated above, it is envisioned that about 12-24 months of research, preparation, and public education would be required on the part of the MCFRS before this legislation would be ready for introduction to the County Council. Once introduced, the legislative process could be lengthy due to anticipated opposition (see above). Assuming the MCFRS is successful in this effort, the FY03-04 time frame would be the likeliest effective date of this legislation.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG Recommendation:

1. Place four additional tankers in service, one each at Fire Stations 31, 4, 30, and a reserve tanker added to the fleet and housed at an appropriate location.

WSSIWG RECOMMENDATION:

Purchase and deploy a reserve tanker in FY02 at Station 31. Place four additional elliptical tankers, (one per year, FY03-06) at Stations 31, 9, 4, and 30, in that order. As each tanker is deployed, move the reserve tanker to the next station due to receive tanker coverage. In addition, replace existing front line engines with combination engine-tankers at Stations 4 (FY-02), 33 (FY-03), and 14 (FY-05), during the normal replacement cycle for engines. Also, purchase an engine-tanker for future Station "34" (Germantown West), when built.

<u>WSSIWG Comments</u>:

Comments received regarding the draft report and input from WSSIWG members focused attention on the need for expanded water shuttle in non-hydranted areas where hose relays from hydrants and, or, static sources is not practical. Additional factors were considered beyond the original scope of the WSWG charge to establish minimum fire flow delivery requirements in rural areas, (500 GPM for 10 minutes). Total available water and travel time for all box alarm engines and tankers, staffing, safe structural fire fighting compliance, and call frequency led the WSSIWG to conclude that use of combination engine-tankers in addition to the elliptical tanker deployment is necessary to fully develop an efficient water delivery strategy.

The draft of NFPA Standard 1710[1] proposes that the first alarm assignment be capable of establishing an "uninterrupted water supply of a minimum 400 gpm for 30 minutes." WSSIWG supports this enhanced recommendation that would modify the original WSWG goal of 500 GPM from 10 to 30 minutes. This increase is necessary to support the third attack line now mandated by the FRC in the May 1, 1999, Safe Structural Fire Fighting Policy. Although NFPA 1710 is a draft standard at this writing, it will likely become a model standard, and, in turn, could be adopted by the County at some future date. The WSSIWG, anticipating the successful adoption of NFPA 1710, is

[1] "Standard for the Organization and Deployment of Fire Suppression, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments."

recommending the addition of a fifth elliptical tanker and replacement of three front line pumpers in rural areas with combination engine-tankers over a five-year period to meet the more stringent requirement.

The need for additional tankers is fully justified based upon test data presented in the WSWG report. The addition of engine-tankers is a cost-effective method to enhance the minimum expectations for rural fire flows in certain areas. These additional resources are necessary to guarantee sufficient first-available water, and rapid, uninterrupted water shuttle capability to non-hydranted areas, including limited-access highways.

The Hyattstown Volunteer Fire Department has proposed moving existing Tanker-9 to front line engine service as the first engine-tanker in the county in exchange for a county -owned elliptical tanker. The WSSIWG supports this move recognizing that existing Tanker-9 is better suited as a combination engine-tanker, and that the addition of an elliptical tanker at FS-9 is required to meet the stated fire flow goal. The elliptical tanker would be moved to the future Clarksburg Station "36," when built.

The Laytonsville Volunteer Fire Department has purchased a combination engine-tanker with local funds, anticipating delivery in the Fall of 2000. This unit is intended to replace Tanker 17-2 (1984 Ford, with 1500 gallon capacity). The new unit, as proposed, would be equipped with 2,000 gallons of water, and a 1750 gpm pump on a tandem axle chassis.

Engine-tankers are typically equipped with 1000-2000 gallons of water and a full complement of supply line, attack lines, and other equipment normally carried on attack pumpers. They are limited by the loading and space requirements mandated by the various apparatus manufacturers for a single rear axle chassis. New technologies have offered the opportunity to equip this style unit with a single wheel "tag-axle" as the second rear axle to allow additional weight carrying capability and enhanced braking. Some manufacturers offer a steerable "tag-axle," as well, which permits increased maneuverability. These new technologies should be further evaluated for future apparatus purchases.

Impacts:

1. Ease of implementation:

Once adopted, this enhanced recommendation will require at least five years to fully implement. Adoption of the various training, tactics, and operations recommendations will be required to achieve full benefit from enhanced water shuttle capabilities. A commitment to increased expenditures for apparatus and staffing is essential to success.

2. Fiscal:

The MCFRS apparatus replacement budget has remained level at $1.685 million for the past several years, and would be insufficient to accommodate the tanker and engine-tanker recommendations herein, in addition to other fire-rescue vehicles. The last

elliptical tankers (with 3000-3500 gallon capacities) purchased in Montgomery County in 1993 cost approximately $230,000 each. Estimated current costs for a similar unit would be in the $270,000-$300,000 price range. The last cab forward pumper bids received from Pierce were $283,000. Modifying the specifications to combination engine-tankers is expected to increase the cost of these units up to approximately $400,000, depending upon the need for a second axle. New elliptical tanker deployment will require additional staffing in certain locations, and may be cross-staffed in others. The deployment of combination engine-tankers will not require additional field staffing providing that the engine-tanker respond first in non-hydranted areas. The WSSIWG believes that in either case, these units should last through a twenty-year life cycle, assuming one rehab is performed as necessary.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Procurement procedures and specifications for elliptical tankers, and combination engine-tankers will need to be revised or developed, respectively. Standard operating procedures and training will need to be developed that fully utilizes engines, engine-tankers, and tankers in rural and suburban areas where hydrants are not available. The training program and development of SOPs should be incorporated into the overall scope of the comprehensive water supply policy addressed in Recommendation #2 under the "Training, Tactics, and Operations" category.

5. Geographical:

This recommendation impacts a significant portion of the up-county response area. Areas where tanker and or engine-tankers would be deployed account for approximately 55-60% of the county land area. As the build out continues and hydranted areas expand in Clarksburg, the need for tanker and engine-tanker coverage in those areas can be reconsidered.

Implementation Timeline:

Implementation of this recommendation should be completed in five years, as follows:

FY-02: Purchase and deploy an elliptical tanker as a reserve unit at FS-31. Replace E-41 with an engine-tanker.

FY-03: Purchase and deploy an elliptical tanker at FS-31. Move the reserve to FS-9, and move Engine-Tanker 9 to front line engine service. Replace E-331 with an engine tanker.

FY-04: Purchase/deploy an elliptical tanker at FS-9. Move the reserve tanker to FS-4

Implementation Timeline (Cont.):

FY-05: Purchase and deploy an elliptical tanker at FS-4. Move the reserve to FS-30 or FS-33. Replace E-141 with a combination engine-tanker.

FY-06: Purchase and deploy an elliptical tanker at FS-30 or FS-33. Move the reserve to FS-34.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG Recommendation:

2. Service test all MCFRS pumpers on an approved schedule.

WSSIWG RECOMMENDATION:

2. Service test all MCFRS units equipped with Class A pumps annually in compliance with NFPA-1911, *"The Standard for Service Testing of Pumps on Fire Department Apparatus".*

WSSIWG Comments:

The WSWG proposed a schedule for testing pumpers less than annually. The WSSIWG favors compliance with NFPA 1911 that mandates annual testing. This testing can be accomplished on an in-service basis utilizing MCFRS personnel trained for the task. A minimum complement of test gauges will need to be purchased to initiate regular testing.

Impacts:

1. Ease of implementation:

The recommendation can be easily implemented. Three potential facilities for conducting the tests already exist. One such testing facility is located at the PSTA. The other testing facilities are located at Kensington FS-5 and Silver Spring FS-16. The WSSIWG proposes that a cadre of MCFRS mechanics and driver/pump operators be trained to conduct the testing.

2. Fiscal:

The fiscal impact would be minimal. Purchasing of test gauges and a flow meter would be the only anticipated costs.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Implementation of this recommendation would require the development of a uniform FRC-approved test procedure and database.

5. Geographical:

The testing requirements would apply county-wide.

Implementation Timeline:

The development of a uniform test procedure should be completed by the 2nd quarter of FY01, and testing should be initiated shortly thereafter. The testing process would be performed annually.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

3. Replace current 3-inch supply hose with 4-inch large diameter hose equipped with quarter turn connections and locking safety lugs. In addition, connections on both ends of the hose must be equipped with swivels to prevent the charged line from unlocking accidentally.

WSSIWG Comments:

There is a long-standing nationwide controversy over the use of large diameter hose (LDH). The Draft Report of the Water Supply Work Group (WSWG) addresses some of the concerns commonly raised in the consideration of LDH use. Improved hose design and couplings minimize the connection problems referenced in the WSWG draft report. Comments were received advocating the use of 5-inch hose as the LDH of choice. The water delivery of 5-inch hose is twice as efficient as a 4-inch supply line, and flows of 1500 GPM are available through a single 5-inch line. Water supply is certainly maximized through use of 5-inch LDH.

While these comments are valuable and logical, it is necessary to find a practical and implementable solution to increase our capacity to deliver water county-wide. The WSSIWG, therefore, endorses the recommendation of 4-inch LDH with quarter turn couplings, locking lugs, and swivels on both ends. The WSSIWG further recommends a minimum of 1,500 feet of 4-inch supply line, plus an additional minimum of 500 feet of 3-inch hose for tactical uses other than water supply.

Use of 4-inch LDH will double the MCFRS capability to deliver the required above ground water supply, and fully utilize the capacity of pumps. It should be noted that the rule of thumb for a water relay is less than 4,500 feet using a maximum of three pumpers. A water shuttle is employed when the hose lay is over 4,500 feet. The WSSIWG also recommends implementation begin in the suburban and rural periphery areas of the county and be expanded inward until all areas are transitioned. Along with this changeover, a comprehensive training program must be instituted and maintained on the use of the 4-inch LDH. At this time four LFRDs utilize LDH on a total of six suppression units (i.e., 4-inch hose on Engines 21, 41, and 401, Quint 40, and Tanker 9; 5-inch hose on Engine 112). The current effectiveness and potential use of this LDH by these stations is significantly limited due to the lack of LDH use by neighboring companies.

Impacts:

1. Ease of Implementation:

Implementation of this recommendation is expected to be difficult. A specific plan with a timetable must be developed, station by station, so that implementation is consistent and continuous throughout the county. The ability for neighboring companies not yet outfitted with 4 inch hose to make connections must be addressed. Affected mutual aid companies must also have the capability to effectively make the appropriate connections.

2. Fiscal:

The fiscal impact will be significant. A cost analysis must be done for each station and must be consistent with the implementation timetable, so that the proper appropriations, if necessary, can be requested in a timely manner. Since most supply line is replaced on a 10-year schedule, the cost difference will only be the difference between the cost of 3-inch versus 4-inch hose spread over 10 years. The initial cost of hardware and pumper fittings for use with the 4 inch hose would be high. As new pumpers are ordered under the normal replacement cycle, the 4-inch adapters, fittings and hardware would be absorbed within the cost of the unit.

3. Legislative:

No legislation is required.

4. Policy/Procedures:

A comprehensive training program, that would be consistently maintained, must be developed. The program must include general knowledge relative to 4-inch hose capabilities, usage, friction loss, etc. Specific knowledge pertinent to water relays and shuttle operations must also be included. Consistency of operations throughout the county must be the goal. Procedures must be changed or developed, as necessary, to mirror the objectives of the training. The training program and development of SOPs should be incorporated into the overall scope of the comprehensive water supply operations policy addressed in Recommendation #2 under the Training, Tactics and Operations category.

5. Geographical:

The recommendation would apply county-wide.

Implementation Timeline:

Implementation should be initiated in FY01 and is expected to take five years to complete. Since all newly purchased supply line will be 4-inch in lieu of 3-inch, normal replacement schedules should be accelerated to accomplish this recommendation. Within

Implementation Timeline (cont.):

five years of initiation, the replacement of all 3-inch supply line should be accomplished. This phased-in approach would spread the costs over several years. Timing is also based on the development of training programs and operational procedures and, to a lesser extent, on fiscal considerations.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS " CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

4. All fire fighting hose be tested annually in compliance with NFPA-1962-1998, *"The Standard for the Care, Use, and Service Testing of Fire Hose, Including Couplings and Nozzles".*

WSSIWG Comments:

Hose testing is being done in some fashion at most MCFRS stations. However, some testing continues without the use of approved test equipment necessary to prevent unnecessary injuries while testing hose at the higher pressures required for service tests. In addition, the standard requires replacement of hose after ten years of service. This policy is not in effect at all stations. Now that Microsoft Access® is installed in every station on at least one computer terminal, a standard database can be developed that will assure uniform record keeping and application of the standard.

Impacts:

1. Ease of implementation:

This recommendation should be implemented easily. Annual testing of all hose needs to be added to the work program of all stations containing suppression units.

2. Fiscal:

The DFRS Operations Bureau purchased twenty test gate valves in FY99, four for each of the five DFRS Districts. These valves can be shared among stations to assure that testing is done safely. The hose replacement schedule will need to be accelerated for those departments not presently replacing hose on a ten-year rotation. This will require increased expenditures for hose. This recommendation is related to Equipment and Apparatus Recommendation # 3 (i.e., 4-inch hose upgrade).

3. Legislative:

Legislation is not required.

4. Policy/procedures:

A model policy prepared for the Standard Training Program, through the PSTA, is available to field forces. This could easily be adapted to FRC policy and procedures through the FRC Operations Committee.

5. Geographical:

The hose testing requirement would apply county-wide.

Implementation Timeline:

The policy and procedures should be drafted during the first quarter of FY01. Hose testing should be initiated during the 2nd quarter of FY01, and repeated annually.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

5. Pumpers purchased in the future should be equipped with 1500 GPM pumps.

WSSIWG Comments:

The basis for the increased pump capacity is directly related to Equipment and Apparatus Recommendation #3 (four-inch hose upgrade). The basis for the increased capacity lies in the ability for each pumper to supply two four-inch supply lines, one thousand feet long, from draft.

Considerable discussion took place regarding dual-stage vs. single-stage pumps. Although many field personnel would like to change from two-stage to single-stage, the Apparatus Specifications Committee does not support this change. They strongly advocate the need for two-stage pumps believing that they are more resistant to overheating problems and long-term pump damage. Comments received from several field personnel suggest that the increased efficiency (i.e., greater pressures at lower RPMs) of the two-stage pump is sufficient reason to continue purchasing that type pump. Current information from pump manufacturers does not support this belief. Additional research and study may be in order. There is potential to reduce the initial cost of the pump, pump rebuilding costs, and elimination of a step when operators must pump greater than one-half the capacity of the pump.

Impacts:

1. Ease of implementation:

Implementation of this recommendation would be easy. This change can occur as a written specification change through the Apparatus Specifications Committee.

2. Fiscal:

The cost increase between a 1250 GPM (current) and a 1500 GPM (proposed) pump is minimal. The additional cost could be offset with the conversion to single-stage pumps.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Implementation of this recommendation would require a change to the standard pumper specification. This specification is currently under revision by the Apparatus Specifications Committee.

5. Geographical:

The recommendation would apply county-wide.

Implementation Timeline:

Additional research should be conducted during the first quarter of FY01 concerning the merits of single-stage versus dual-stage pumps. Implementation of the necessary changes to the specification (i.e., 1500 gpm requirement, single or dual-phase pump) should occur no later than the 2nd quarter of FY01.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

6. MCFRS pumpers should carry a standard hose and hose appliance complement that is designed to maximize the capacity and efficiency of the apparatus.

WSSIWG Comments:

In accordance with the WSWG charge, the WSWG draft report focused on water supply rather than water application. **WSSIWG recommends extension of the WSWG's recommendation to include water delivery for both supply and attack purposes**. To achieve the full benefits of standardization, all engine company components should be standardized as much as possible. This should include hose load and nozzle configurations, master streams, pump size, and portable appliance inventory.

A standard pumper configuration will benefit the MCFRS in many ways. Most importantly, training on methods of deploying hoselines and training of pump operators will be consistent. Secondly, a pumper anywhere in the county that goes out of service can be replaced by a similar unit, with standardized equipment. Presently, when a frontline pumper goes out of service and is replaced by a reserve pumper, the equipment changeover process may cause considerable downtime for the unit. Using a standard pumper configuration allows the greatest flexibility to design and implement strategic and tactical evolutions designed to maximize the use of available resources.

Impacts:

1. Ease of implementation:

Some hose standardization already exists. Additional standardization could occur simply through cooperation and consensus among all elements of the MCFRS. Most county specification pumpers in the fleet are of similar construction and configured to carry the same amount of water, supply lines, and attack lines. It has been significantly more challenging; however, to reach consensus regarding attack line diameters, lengths and nozzle types, as well as hose load configuration. Final direction on this issue should come about as a result of consensus among MCFRS elements. However, direction may be required from the FRC if a consensus cannot be achieved.

2. Fiscal:

The true fiscal impact cannot be determined until a final hose configuration is established. Once the desired configuration is established, a survey to determine shortages and deficiencies would be necessary to develop a replacement schedule and to determine the fiscal impact.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Policies and procedures for standardizing hose and hose appliance complements on MCFRS pumpers will need to be developed. This new policy should be addressed within the scope of the comprehensive water supply operations policy called for in Recommendation #2 under the Training, Tactics, and Operations category.

5. Geographical:

It is conceivable that one county-wide standard will not work as intended. Discussion took place within the WSSIWG regarding an urban and rural pumper configuration. If the recommendation for engine-tankers were adopted, then a standard would need to be developed for those units, as well.

Implementation Timeline:

The policy for standardizing hose and hose appliance complements on MCFRS pumpers should be developed in FY01. At the same time, a survey to determine shortages and deficiencies across the MCFRS should be conducted. Implementation of the policy should be accomplished using a multi-year approach. This phased-in approach would spread the costs over several years. The WSSIWG envisions full implementation of this recommendation by FY06.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

7a. The specifications for future tankers should closely parallel the existing elliptical-type tankers in service at Stations 14 and 17, with additional improvements as listed.

7b. All local fire and rescue department (LFRD) apparatus specifications prepared for purchase by the LFRDs should be reviewed by the Apparatus Specifications Committee to assure that minimal essential components required by the FRC be included.

WSSIWG Comments:

7a: Future tankers designed in accordance with the existing elliptical tanker specification, with modifications, will assure that a tanker-shuttle can be initiated and sustained in areas lacking other water sources. The addition of electrically-controlled side discharges[2], increased venting[2], and large capacity direct fills will assure that the MCFRS tanker fleet can fill quickly (i.e., 1000 gpm) and dump quickly (i.e., >1000 gpm). These features are essential to maximize water delivery, with a minimum commitment of personnel.

7b: This recommendation is necessary to assure compliance with MCFRS safety initiatives and performance specifications for future apparatus.

Impacts:

1. Ease of implementation:

7a: This recommendation should be easy to implement. The above-described modifications can be brought about by simple changes to the MCFRS' written specifications for tankers.

7b: This recommendation may be difficult to achieve in some cases, therefore an FRC mandate may be required to fully implement it.

2. Fiscal:

There will be a modest increase in apparatus procurement costs.

[2] This feature can be controlled from the cab

3. Legislative:

Legislation is not required.

4. Policy/procedures:

7a: No impact is anticipated.

7b: May require FRC action to mandate minimum specifications for future LFRD apparatus purchases.

5. Geographical:

The two-part recommendation will apply county-wide.

Implementation Timeline:

The recommendations should apply to the next tanker purchased (i.e., FY02) and all others thereafter.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

8. The MCFRS initiate a cooperative effort with the State Highway Administration and the County's Department of Public Works and Transportation to strategically place six-inch, dry, vertical standpipes on key highway overpasses along limited access highways in Montgomery County. Guidelines stated in NFPA-502, *"Fire Protection for Limited Access Highways, Tunnels, Bridges, Elevated Roadways, and Air-Right Structures,"* should be incorporated as appropriate.

WSSIWG Comments:

Recommendation #9 of the "Training, Tactics and Operations" category is closely related to this recommendation. While the focus of that recommendation is tactical use of dry vertical standpipe systems (DVSPS) by the MCFRS, this recommendation focuses on the equipment and installation of DVSPS. While the DVSPS is the preferred method of water supply along limited-access highways, there may be instances where it is either impractical or not cost-effective. Further study of the feasibility of implementing this recommendation on a widespread basis is required.

Since publication of the WSWG Draft Report, several meetings have occurred between the MCFRS and the State Highway Administration (SHA). A project to pilot test a DVSPS in Montgomery County has been proposed to the SHA through a cooperative effort between the Bethesda Fire Department and the Division of Fire and Rescue Services. The first DVSPS in Montgomery County is proposed for the Greentree Road overpass above Interstate 495 in Bethesda. The MCFRS is also looking at the feasibility of incorporating a DVSPS into the design of the replacement interchange at I-270 at Old Georgetown Road.

The MCFRS, in conjunction with WSSC and the City of Rockville Public Works Department, may also want to assess the feasibility of installing hydrants in close proximity to highway overpasses that are equipped with DVSPS. This would greatly minimize the length of hose lay between the hydrant and the DVSPS, but would add to the overall cost of this program.

Impacts:

1. Ease of implementation:

Implementation of this recommendation may be difficult due to the costs and the SHA's mandate to improve the aesthetics of highway overpasses throughout the state. A

detailed assessment is needed of locations where DVSPS are needed most and where they would be both practical and cost-effective. These locations would then need to be prioritized. Key highway interchanges such as the points where I-270 and the I-270 Spur connect to I-495, and where the I-270 connects to I-370, would be obvious candidates.

Success will be dependent upon cooperative interaction between the MCFRS and representatives of the SHA, DPWT, WSSC, and the City of Rockville Public Works Department.

2. Fiscal:

It is anticipated that the SHA would bear the costs of DVSPS in cases where a state highway crosses an interstate (e.g., Route 355 above I-495). In situations where a County roadway crosses above an interstate (e.g., Wootten Parkway above I-270, Persimmon Tree Road above I-495), the costs may be borne solely by the SHA or may need to be shared between the SHA and the County. If new hydrant installations near overpasses are pursued, then funding from WSSC and the City of Rockville will be required.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

An operations policy needs to be developed that will take full advantage of these DVSPS (see Recommendation #9 - "Training, Tactics and Operations" category).

5. Geographical:

This recommendation will apply primarily to certain limited-access highways where there exists the potential for retrofitting existing bridge spans. The recommendation would also apply to future bridge projects (e.g., replacement of the I-270/Old Georgetown Road interchange), where DVSPS could be incorporated into the design.

Implementation Timeline:

Implementation of this recommendation is in progress, as described above. It is anticipated that coordination of additional DVSPS will continue in FY01 and thereafter.

WATER SUPPLY RECOMMENDATIONS
"EQUIPMENT AND APPARATUS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

9. A pumper equipped with a compressed air foam system should be purchased to enable pilot testing of this new technology.

WSSIWG Comments:

Compressed air foam systems (CAFS) utilizing Class A foam were originally developed in the 1970s for use in wildland and grassland fire situations. Its use in structural firefighting has been tested since the early 1990s. Class A foam is generally produced with a very low ratio of foam concentrate to water; typically at a rate of 0.5 percent or less. Several studies conducted in various parts of the United States over the past eight years have demonstrated the advantage of using CAFS in a structural firefighting environment.

The advantages delineated in the WSWG Draft Report, and cited in other studies, are compelling. However, further study is necessary prior to making the commitment to purchase a unit for a MCFRS pilot test. Several disadvantages have been noted, particularly hose kinking, excessive nozzle reaction, and high air pressure discharge if the line fails for any reason. These disadvantages need to be addressed prior to purchasing a CAFS unit.

The WSSIWG suggests that in-service units from other jurisdictions be examined and that MCFRS personnel be allowed to have hands-on familiarization with these units. If practical application questions can be resolved; the WSSIWG would endorse the recommendation to purchase a unit for pilot testing. The cost is reasonable if added to the cost of an engine that is in the replacement schedule. Because of the difficulty of installing this system on an existing pumper, the WSSIWG does not recommend that any current engine be retrofitted with this technology. The WSSIWG concurs with the deployment suggestions of the WSWG.

Impacts:

1. Ease of Implementation:

Implementation of this recommendation should have minimal impact. A single CAFS unit would be purchased to replace a current first line engine. The unit would be placed in service as a first line engine, and the compressed air foam system would be used to

suppress all types of fires. Specialized training would be required for all personnel who would be using this unit.

2. Fiscal:

The fiscal impact would be minimal. The cost of a CAFS system when included in an engine that is scheduled for replacement would be an additional $35,000–$40,000. Maintenance costs are not known, but as with any foam system, they may be high. The cost of post-incident replacement of Class A foam is also considerable and should be budgeted accordingly.

3. Legislative:

Legislation is not required.

4. Policy/Procedures:

Specialized training must occur for both drivers and operating crews prior to placing a CAFS-equipped engine in service. While a policy is not required, standard operating procedures must be developed and practiced prior to use of the CAFS unit. The SOP should be addressed within the scope of the comprehensive water supply operations policy called for in Recommendation #2 under the "Training, Tactics, and Operations" category.

5. Geographical:

The only geographical consideration is where to deploy the pilot unit. The suggestion of the WSWG to place the CAFS engine in an area having a mix of urban, suburban and rural hazards (e.g., FS-28, 29 or 31) should be strongly considered.

Implementation Timeline:

A CAFS unit should be requested in the FY02 MCFRS Operating Budget, and it should also be placed in service during FY02, if possible.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

1. MCFRS resources should be deployed and SOPs should be established that would enable first arriving suppression units to initiate a rural fire attack with at least 5,000 gallons of water for ten minutes (i.e., uninterrupted 500 gpm minimum fire flow for initial ten minutes).

WSSIWG Comments:

As noted in the final report, the WSSIWG accepted the premise that MCFRS strategic and tactical planning should be based on a minimally acceptable fire flow of 500 gpm for the initial 10 minutes of a fire, requiring 5000 gallons of water for the initial 10 minutes. However, proposed NFPA Standard 1710 ("*Standard for the Organization and Deployment of Fire Suppression, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*") calls for a minimum of 400 gpm for the initial 30 minutes, requiring 12,000 gallons of water for the initial 30 minutes. Currently, neither of these minimum fire flows can be consistently achieved by the MCFRS in non-hydranted areas.

Regarding the WSSIWG recommendation and the proposed NFPA standard, the water supply requirement for each is less than the very conservative two-hour requirement of the ISO. Should proposed NFPA 1710 become a standard, the WSSIWG believes that the 30-minute (vs. proposed 10 minute) requirement would be appropriate for adoption in Montgomery County, in conjunction with the WSSIWG's proposed 500 gpm rate of flow requirement. The additional 20 minutes of water (at 500 gpm) would increase fire fighter safety and provide additional water for major fires that cannot be controlled during the initial 10 minutes of MCFRS intervention. Equipment and Apparatus Recommendation #1 (additional apparatus deployment) was revised by the WSSIWG with the intent of MCFRS meeting the 30 minute water flow requirement.

Impacts:

1. Ease of implementation:

Implementation of this recommendation is expected to be moderately difficult because it is dependent upon multiple actions occurring over several years, most having substantial cost impacts (see below). The acquisition of several new tankers, tanker-pumpers, and associated equipment will require considerable time and money. Additional work years will need to be placed in future operating budgets to ensure that tankers are staffed as

they are placed in service. Developing and conducting enhanced water supply training will be required. Finally, the development of new sources of static water supply in rural areas, or the enhancement of existing sources, will be a time-consuming and potentially costly endeavor.

2. Fiscal:

The fiscal impact of implementing this recommendation will be significant. Apparatus (i.e., 5 tankers and 3 tanker-pumpers) and equipment (i.e., hose, hose appliances, etc.) costs spread over the next five to eight fiscal years will be considerable. [See recommendations under "Equipment and Apparatus" section for cost estimates].

In addition, costs for career personnel will increase, assuming that tankers would have guaranteed minimum staffing of one person at all times. Staffing of tankers would be determined on a case by case basis, considering the following alternatives: 1) dedicated DFRS position around the clock, 2) DFRS cross-staffing between the tanker and other units, 3) volunteers, 4) a combination of DFRS personnel and volunteers. It is envisioned that tanker-pumpers would have the same staffing as is presently provided for engines, thus no additional fiscal impact is anticipated. Specialized water supply training for all MCFRS personnel will have a fiscal impact upon the MCFRS training budget, as well. [See Recommendation #2 under the "Training, Tactics and Operations" section concerning training costs.]

Other fiscal impacts of implementing this recommendation will include the costs of installing new static water sources (e.g., underground tanks, dry hydrants) in non-hydranted areas and enhancing existing sources (e.g., improving accessways to lakes/ponds, installing dry hydrants between access roads and lakes/ponds, etc.). [Cost estimates for static water sources are provided within Recommendation #4 under the "Planning and Technology" section.]

3. Legislative:

Legislation is not required.

4. Policy/procedures:

The policies and procedures that will be required for implementing this recommendation fall within the scope of the comprehensive operations policy covered in Recommendation #2 under the "Training, Tactics and Operations" section.

5. Geographical:

The provisions of this recommendation would apply to all areas of the county lacking fire hydrants.

Implementation Timeline:

Because this recommendation is dependent upon additional resources (i.e., considerable number of apparatus, equipment, static water systems), staff, and enhanced training, complete county-wide implementation is not anticipated until the FY05-08 time frame. Considering that the short-term development of SOPs and the proposed schedule for the purchase of tankers and tanker-pumpers, certain areas of the county may meet the stated objective earlier than FY05.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

2. A MCFRS operations policy should be established addressing all aspects of fire department water supply, encompassing standard operating procedures for all areas of the county -- urban, suburban and rural. In addition, all MCFRS operational personnel should receive updated training on fire department water supply, addressing new tactics, equipment, and technology implemented as a result of the overall recommendations of the Water Supply Work Group.

WSSIWG Comments:

The MCFRS does not have a single, comprehensive policy for effectively and efficiently establishing water supply for major fires. Thus, water supply operations lack consistency from one area to another, which can adversely affect fire suppression operations, resulting in greater fire damage and an increased potential for casualties – both to citizens and MCFRS personnel. The problem can be attributed to several factors -- lack of advanced water supply training directed at all fire fighters, non-standardized apparatus and equipment, lack of high volume water shuttling apparatus in rural areas, and the lack of a coordinated effort among MCFRS elements to standardize operations.

The WSSIWG recognizes the fact that separate standard operating procedures (SOPs) would be required for urban, suburban and rural operations, however, certain tactics are applicable to all three. It is imperative that all fire fighters have the necessary knowledge and skills to efficiently establish an effective water supply in urban, suburban and rural areas, because on any given day or incident they may be responding to a fire in any of the three areas. In the case of DFRS personnel, they may find themselves reassigned to a rural station from an urban station and have to make a quick adjustment to different water supply tactics.

To address these issues, the WSSIWG recommends that a comprehensive operations policy be established addressing all aspects of fire department water supply, and that all MCFRS fire fighters receive updated and advanced training on fire department water supply for urban, suburban and rural fire incidents. The policy must also take into account the apparatus, equipment, technology, concepts and initiatives recommended throughout this report. The policy must also give due consideration to water supply issues concerning limited-access highways and forested/undeveloped areas, rather than concentrating solely on structure fires.

Impacts:

1. Ease of implementation:

This recommendation should be relatively easy to implement, provided that the work group that is established to develop the policy is composed of a balanced cross-section of career and volunteer personnel representing urban, suburban and rural fire stations, and also representatives of the Operations Committee, Training Subcommittee, and the Training Academy. A logical starting point would be a review of any locally-developed SOPs as well as those available from other jurisdictions. The WSWG has collected several publications that should be useful in this endeavor. The WSSIWG suggests that the work group focus first on the policy and SOPs and then address the training program that will be needed to ensure that the policy and procedures are understood and consistently put into practice.

2. Fiscal:

There should be little or no fiscal impact, since the work will be done in-house by a MCFRS work group.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

The recommendation itself calls for the development of a policy and associated procedures. See the "Comments" and "Ease of Implementation" sections above.

5. Geographical:

This recommendation applies county-wide.

Implementation Timeline:

The proposed work group should be established in the 1st quarter of FY01, and the group should complete a draft policy and a proposed training program by the 3rd quarter of FY01. The policy should become effective, assuming FRC adoption, by the 4th quarter of FY01. The training program should be initiated during FY02 and be delivered continuously thereafter.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

3. Tankers should be added to the structure fire response assignment for all streets in areas where municipal fire hydrants are not available. To designate these areas, separate block face nodes should be established within the computer-aided dispatch system and assigned separate firebox areas.

WSSIWG Comments:

The omission of tankers on some structure fire assignments within areas lacking hydrants exists within the computer-aided dispatch (CAD) system. This problem is a serious deficiency that must be corrected in the immediate future. The WSWG report cites a major incident where tanker dispatch was delayed because the response assignment did not initially include a tanker.

Use of the block face node (BFN) feature within the CAD will ensure that any street, or portion thereof, lacking hydrants will be flagged as requiring water tankers for structure fires. To achieve this capability, specific address ranges along roadways lacking hydrants will have to be identified. While maps and data collected by the WSWG may be useful in identifying non-hydranted streets, direct coordination with the three municipal water authorities will be necessary to ensure accuracy of the information and to continuously glean information concerning whether developing areas will or will not be served by hydrants.

This recommendation should be implemented in conjunction with, and be a portion of, Recommendation #2 of the "Training, Tactics and Operations" category.

Impacts:

1. Ease of implementation:

Implementation of this recommendation should be relatively easy, assuming the above mentioned references are utilized. The most time consuming aspect of this task will be data entry. Once the information has been entered using the BFN feature within the CAD, the assignment of tankers to non-hydranted address ranges will be simple. The continuous addition of new roadways and properties as development occurs in the county will necessitate regular updating of the CAD to ensure that tankers are assigned to non-hydranted areas.

2. Fiscal:

The fiscal impact should be minimal, as the task would likely be assigned to on-duty MCFRS personnel (i.e., ECC staff, light-duty staff, etc.), with some overtime possible.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Implementation of this recommendation will require immediate modification of dispatch assignments in some areas (i.e., adding tankers, where applicable) and the creation of additional fire box areas for small areas lacking hydrants within box areas that are generally served by hydrants.

5. Geographical:

This recommendation applies to non-hydranted areas of the county.

Implementation Timeline:

Implementation should be initiated immediately and completed no later than the 2nd quarter of FY01.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

4. Suppression forces should deliver a minimum required fire flow of 3000 gpm for townhouses, garden apartments, and other groups of dwellings.

WSSIWG Comments:

Based on comments received concerning the WSWG Draft Report, the WSSIWG has changed the 1500 gpm requirement in this recommendation to 3000 gpm. The 3000 gpm flow can be achieved through existing dispatch/response assignments, with modest modifications in certain areas of the county. While MCFRS pumpers (with pumping capacities ranging from 750-1250 gpm) can presently provide 3000 gpm when deployed properly and when served by an adequate water supply, the 1500 gpm requirement for future pumpers (see Recommendation #5 – "Equipment and Apparatus" category) will enhance the MCFRS ability to achieve the 3000 gpm flow.

Impacts:

1. Ease of implementation:

This recommendation is relatively easy to implement in hydranted areas, assuming the hydrants are in proper working order, water flow is not adversely affected by a problem in the water distribution network, and sufficient supply lines are laid and charged (e.g., six 3-inch lines or three 4-inch lines). It may be necessary; however, to review dispatch assignments/procedures where mutual aid companies are deployed in order to assess the capability to deliver 3000 gpm with a combination of MCFRS and mutual aid resources.

2. Fiscal:

There should be little or no fiscal impact.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

The procedures that will be required for implementing this recommendation fall within the scope of the comprehensive operations policy covered in Recommendation #2 under the "Training, Tactics and Operations" section.

5. Geographical:

This recommendation applies to hydranted areas of the county and to non-hydranted areas where relays less than 4500 feet are possible from alternate sources of water of at least a 30,000-gallon capacity.

Implementation Timeline:

This recommendation should be fully implemented within hydranted areas of the county by the 2nd quarter of FY01. Generally speaking, the 3000 gpm requirement can be met now by existing MCFRS resources, if water supply operations are conducted properly.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

5. Establish certified drafting points in non-hydranted areas, meeting minimum criteria established by the Insurance Services Office, Inc. (ISO), for use during initial fire attack. [This does not include tanker fill sites.]

WSSIWG Comments:

The minimum criteria for ISO-certified drafting points for fire attack, as listed on pages 51 and 52 of the WSWG Final Report, ensure that the fire department will have a readily accessible and reliable source of water to sustain a 250 gpm flow for at least two hours.

If the minimum rural fire flow requirement of 500 gpm for the initial 10 minutes is adopted by the FRC (see Recommendation #1 – "Training, Tactics and Operations"), this recommendation should be implemented concurrently. Certified drafting points will contribute to the MCFRS' ability to achieve the WSSIWG-proposed 500 gpm/10 minute requirement, or the 30-minute requirement proposed in NFPA 1710.

Impacts:

1. Ease of implementation:

Implementation of this recommendation will require a significant amount of field work by MCFRS personnel, who will need to identify candidate drafting sites, determine whether they meet the ISO criteria, coordinate their use as potential drafting points with the owner (private or public), and conduct bi-annual inspections. In addition, implementation of this recommendation may require coordination with one or more of the following county and state agencies: M-NCPPC, Department of Environmental Protection, (State) Department of Natural Resources, Department of Public Works and Transportation, State Highway Administration, etc. Permits may also be required for drafting points that require improvements (see below).

Many potential sites may need significant enhancements such as all-weather access or installation of dry hydrants (optional), thus requiring construction or installation in order to meet ISO criteria. Improvements such as these may preclude MCFRS use of the water source (until improvements are completed) and add costs. Each certified drafting point, per WSSIWG recommendation, would require a reflective identification sign that provides fire fighters information on the drafting point's estimated capacity and its distance from the main roadway. If dry hydrants are to be installed at the drafting site

(see Recommendation #4 of the "Planning and Technology" category), there are specific ISO criteria that must be met to qualify for certification.

2. Fiscal:

While some potential drafting points may meet ISO criteria without the need for improvements (other than the required reflective sign), others will require major improvements such as all-weather access or installation of dry hydrants. While the signs would cost about $25 each, the cost of constructing all-weather access would vary from site to site depending upon terrain and the amount of accessway that is needed. If a dry hydrant is to be included, the cost will vary from site to site depending upon the required configuration (see Recommendation #4 – "Planning and Technology" category). The costs of all improvements will include both materials and labor.

The County, State, and private property owners could share the cost of establishing ISO-certified drafting points. It is unlikely that the MCFRS would incur any of these costs.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

A process for identifying and evaluating candidate drafting points will need to be developed and implemented by the MCFRS through a work group. The group will also need to secure agreements with property owners for use of drafting points by the MCFRS and oversee the installation of any required improvements. An SOP addressing use, inspection, and testing of drafting points will be included in the comprehensive water supply policy addressed in Recommendation #2 under the "Training, Tactics and Operations" category.

5. Geographical:

This recommendation applies to non-hydranted areas of the county.

Implementation Timeline:

The project should be initiated during FY01. Although the WSSIWG envisions several ISO-certified drafting points being established between FY01-05, the program is intended to be continuous thereafter.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

6. A new and distinct dispatch assignment should be established for a supplemental "Water Supply Task Force" that comprises two tankers for water shuttle, a pumper to pump from a static or hydranted fill-site, and an additional command officer to be dedicated to the water supply function.

WSSIWG Comments:

Incident commanders traditionally request additional alarms for one of three reasons: more water, more staffing, or more equipment. Establishment of a "Water Supply Task Force" (WSTF) would be a strategic dispatch assignment designed to reduce the need for a full 2nd alarm in non-hydranted areas for reasons related solely to water supply. The WSTF concept will provide a convenient method for the incident commander to request, from ECC, the dispatch of additional water supply resources for a working incident in a non-hydranted area. Beyond the first alarm suppression units, the incident commander would receive two additional tankers, a pumper to be positioned at the fill site, and a command officer to oversee the water supply operation.

Impacts:

1. Ease of implementation:

Implementation of this recommendation should be a simple task and achieved quickly. Modification of current dispatch procedures would be required, but should be an easy task for the ECC staff. Entering the WSTF information into the CAD could be accomplished in conjunction with the assignment of tankers to the response algorithms for non-hydranted areas within areas that are generally served by hydrants (see Recommendation #3 – Training, Tactics and Operations).

2. Fiscal:

There would be no fiscal impact, as on-duty MCFRS personnel at the ECC would accomplish this task.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Implementation of this recommendation does not require a new policy or procedures. However, within the CAD system, each non-hydranted firebox area will need to have a WSTF algorithm created to allow for quicker dispatch of the WSTF when the need arises. The WSTF function should be incorporated into the comprehensive water supply policy addressed in Recommendation #2 under the "Training, Tactics and Operations" category.

5. Geographical:

Primarily, non-hydranted areas and limited-access highways. A WSTF could also be applicable to urban areas during times of interruption of municipal water service.

Implementation Timeline:

The WSTF recommendation could be implemented almost immediately, and should be implemented no later than the 2nd quarter of FY02.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

7. Develop improved coordination, training, and maintenance for use of existing sound barrier fire department connections along portions of Interstate 495.

WSSIWG Comments:

As stated on pages 53-54 in the WSWG Final Report, there are numerous issues surrounding use, coordination, training and maintenance of the fire department (FD) connections along the I-495 sound barriers. The MCFRS should take the initiative to revitalize this existing water supply resource along this major highway, which has experienced several major fires and numerous hazardous material spills involving tankers and other trucks.

Recommendations offered by the DFRS personnel assigned to Station 19 (see page 54 of WSWG Final Report) should be considered. The experiences of Prince Georges County and Fairfax County fire and rescue departments concerning their I-495 sound barrier FD connections should also be reviewed in an effort to use this resource more efficiently in Montgomery County. In addition to examining the use and maintenance of the existing connections along I-495, the MCFRS should assess the need and feasibility of expanding the system, while also considering the use of dry vertical standpipe systems (see Recommendation #8 – Equipment and Apparatus, and Recommendation #9 – Training, Tactics and Operations).

A SOP to be used by all MCFRS units operating on I-495 needs to be developed. The SOP should address: third-due (or later due) companies quickly locating the closest fire hydrant to the I-495 incident; the laying, by hand, of supply lines between the closest hydrant and the FD connection through the sound barrier; and completing the hose lay between the FD connection and the engine(s) deployed on I-495. The evolution must be practiced on a regular basis and involve all engine companies due on the initial alarm.

Impacts:

1. Ease of implementation:

Implementation of this recommendation would require multi-jurisdictional planning and cooperation between the MCFRS, State Highway Administration (SHA), and WSSC. A plan would need to be developed addressing responsibilities of each agency/organization and timelines. For example, the SHA might be responsible for periodic clearing of

vegetation in the vicinity of the FD connections in the barriers, ensuring that MCFRS personnel can gain quick access through the doorways, and the posting of reflective signs on the Beltway side of the barrier (perpendicular to the line of sight) displaying an identification number for each connection and the address of the closest fire hydrant in the adjacent neighborhood. WSSC would be assigned the responsibility of ensuring that the hydrants paralleling I-495 are always functional. The MCFRS might be responsible for periodically inspecting the FD connections and performing a water flow test utilizing the closest hydrant and the FD connection through the barrier.

The MCFRS SOP development and subsequent training should be a fairly easy task.

2. Fiscal:

The MCFRS would incur no costs implementing this recommendation, assuming on-duty personnel were used for plan and SOP development. The SHA would bear most of the costs, which should be minimal (e.g., reflective signs cost about $25 each). If any new FD connections and barrier doorways were needed along I-495 as determined by the MCFRS, the SHA would be asked to cover these installation costs, as well.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Implementation of this recommendation would require development of both the plan and the SOP described above. The SOP should be incorporated into the comprehensive water supply policy addressed in Recommendation #2 under the "Training, Tactics and Operations" category.

5. Geographical:

Presently, the recommendation applies to Interstate 495, but it could be expanded, and modified as necessary, to include any limited-access highway where plans call for installation of sound barriers between the highway and adjacent neighborhoods.

Implementation Timeline:

The plan and the SOP should be developed in FY01 and fully implemented no later than FY03.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

8. Identify alternate water supply sources by means of standard reflective signs along main roads, indicating the source's location, capacity, and distance from the posted sign.

WSSIWG Comments:

Uniform signage and identification systems already exist in other jurisdictions (e.g., Howard County District 5-Clarksville) and are very effective. With strategic placement of the signs, apparatus drivers can easily locate the fill site and know the maximum quantity of water that is available.

Despite the fact that within a few years MCFRS units will have MDTs to consult for location and data on alternate water supply sources, the proposed signs will ensure that units can easily locate these sources. The signs will also be helpful to mutual aid units that may be unfamiliar with Montgomery County.

Impacts:

1. Ease of implementation:

The implementation of this recommendation would be best accomplished through the same work group that has been proposed in Recommendation #4 under the "Planning and Technology" category, since both recommendations pertain to alternate water sources. The work group would develop a standard sign design, identify appropriate locations to post the signs, determine the specific distance information that will appear on each sign, and oversee their production and posting. The work group will have to coordinate the posting of many signs in the first few years (as few exist now), and the program will require continuous attention thereafter as new static water sources are added.

The design and posting of signs would have to be coordinated with the County's Department of Public Works and Transportation (DPWT) and the State Highway Administration (SHA). Permits may be required, as well.

2. Fiscal:

The fiscal impact of implementing this recommendation will be modest, but continual. The standard sign is expected to cost about $25. An arrangement might be forged

between the MCFRS and the County's DPWT, and/or SHA, to install the signs at no cost. Alternatives for sign installation would include MCFRS personnel, developers, property owners, homeowner associations, and/or civic groups, etc., provided that County and State traffic engineering practices for sign installation are followed. As a last resort, a contractor may have to be hired, thus adding to the overall cost of the program.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

This recommendation does not require the development of a policy or procedures. The design of a standard sign would need approval of the FRC, following endorsement by the SHA and DPWT.

5. Geographical:

The recommendation would apply county-wide, with initial emphasis on non-hydranted areas. At some future date, the program might be expanded to include hydranted areas, as a contingency in response to a major disruption of the municipal water distribution system (see Recommendation #3 – Planning and Technology).

Implementation Timeline:

In accordance with Recommendation #4 under the "Planning and Technology" category, the proposed work group should be established early in FY01. The group will immediately begin design of the standard signage and the process of identifying locations to post them. By late FY01, the initial signs should be in place, with others to follow from that point onward. The program would need to continue indefinitely.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

9. Tactical use of dry vertical standpipes should be adopted as the preferred method to establish expanded water supply relays on limited-access highways.

WSSIWG Comments:

Recommendation #8 of the "Equipment and Apparatus" category is closely related to this recommendation. While that recommendation has an equipment/system focus, this recommendation focuses on the tactical use of dry vertical standpipe systems (DVSPS) by the MCFRS.

Use of DVSPS should greatly reduce the amount of time and resources required for establishing an effective and reliable water supply for incidents on limited-access highways. While use of DVSPS is the preferred method of establishing expanded water supply relays on limited-access highways, there may be instances where DVSPS are impractical (e.g., no nearby hydrants to supply the DVSPS), and alternative methods of water supply will be required.

Impacts:

1. Ease of implementation:

This recommendation should be fairly easy to implement, assuming that DVSPS are in place as a result of Recommendation #8 - "Equipment and Apparatus". The following actions would be required: SOP development, SOP familiarization, and on-site hands-on training (to the extent possible considering the inherent traffic dangers). The most difficult aspect of using the DVSPS will be the proper positioning of MCFRS units to complete the hose lay between the hydrant, DVSPS, and relay pumper(s) on the limited-access highway.

2. Fiscal:

On-duty MCFRS personnel would accomplish development of the DVSPS SOP and associated training, therefore little or no costs are anticipated in implementing this recommendation. As stated in Recommendation #8 in the "Equipment and Apparatus" category, the cost of installing DVSPS would be borne by the SHA and DPWT.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

Efficient and effective use of DVSPS by MCFRS personnel will be dependent upon the development of an effective SOP and tactical training. The required SOP and training should be a component of the comprehensive operations and training policy recommended in Recommendation #2 of the "Training, Tactics, and Operations" category.

5. Geographical:

The focus of this recommendation is existing and proposed limited-access highways throughout Montgomery County.

Implementation Timeline:

With the potential for installation of the county's first DVSPS on the Greentree Road overpass above I-495 in Bethesda, the DVSPS SOP must be developed and adopted during FY01. Training of MCFRS personnel in the Bethesda-Cabin John area must also occur quickly. All MCFRS personnel should receive initial training on use of DVSPS no later than FY03, with priority emphasis on companies located in the down-county area where most of the DVSPS are anticipated.

WATER SUPPLY RECOMMENDATIONS
"TRAINING, TACTICS AND OPERATIONS" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

10. Initiate a pilot test of fire hydrant marking systems in both urban and suburban areas.

WSSIWG Comments:

There are several systems available on the market for marking hydrants, as described on pages 89-90 of the WSWG Final Report. While the ultimate goal is to obtain hydrant information from MDTs (that should be available inside all suppression apparatus within a few years), the capability to visually locate a specific hydrant will always be advantageous. Each marking system has associated issues that would have to be addressed, such as installation costs, the threat of vandalism, the need to clear snow/ice, etc. There may be opportunities for assistance from the public to address some of these issues.

The pilot test should, at a minimum, include an evaluation of each of the systems described in the report. The MCFRS work group assigned to this project will need to carry out the following actions: 1) identify an area to test each marking system, 2) obtain a sufficient number of markers from the vendor, 3) coordinate installation of the markers with the DPWT, SHA, and affected communities, 4) devise a standardized method for evaluating the various systems, 5) present the pilot test findings and conclusions in a report to the FRC. The work group should consider running the pilot test for up to a full year to evaluate the performance of the various marking systems over the spectrum of weather conditions.

Impacts:

1. Ease of implementation:

Implementation of this recommendation could be relatively easy, if approached as a partnership between the MCFRS, transportation officials, municipal water authorities, and community groups.

2. Fiscal:

The fiscal impact on the MCFRS could range from minimal to moderate. The work group may be successful in obtaining free samples or loaner samples from the manufacturers/vendors. If markers must be purchased, the DPWT, SHA and/or water

authority may be willing to provide funding. Community groups may be willing to contribute, as well. Once the markers are obtained, the DPWT, SHA and/or water authority may be willing to install them at no cost to the MCFRS.

Fire Hydrant Spotters™ (blue reflective, snow-plowable markers that are embedded in the road surface) cost about $16.50 each, and require an epoxy adhesive costing about $1 per marker to install. The orange polycarbonate FlexStake™, which attaches on or next to a hydrant, comes in several lengths. The four foot version, with reflective decals and mounting hardware, costs about $21 each.

3. Legislative:

Legislation is not required.

4. Policy/procedures:

A policy and procedures are not required for the proposed pilot test; however, guidelines for installation of the marking systems will have to be developed in coordination with the DPWT and SHA. A process for evaluating the hydrant marking systems will need to be developed (see "Comments" above).

5. Geographical:

The proposed pilot test will be limited to small areas selected by the work group. These areas are to include both suburban and urban settings.

Implementation Timeline:

The proposed pilot test should be conducted no later than FY02, and the work group's findings and conclusions should be published no later than FY03. The FRC will then determine whether a hydrant marking system, or combination of systems, should be adopted for county-wide application.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

1. Develop standardized Geographic Information System/AutoCAD maps and diagrams indicating the locations of all hydrants, fire department connections, and static water supply sources. When the mobile data terminal (MDT) system goes online, ensure the inclusion of these maps and diagrams and tie to them data files concerning access, ownership, and specific operational tactics regarding each water supply source. In the interim until the MDT is implemented, develop and place on-board fire suppression units hard copy plans that include the same maps, diagrams, and information.

WSSIWG Comments:

An on-going initiative of the Finance, Technology and Planning Committee, the development of standardized GIS maps has begun with Burtonsville Station 15's area. Through a pilot program, an ArcView-trained firefighter is developing maps of Station 15's first-due area, with assistance provided by the County's GIS Office. Upon completion of this pilot effort, a follow-on program will be established to develop standardized GIS maps for all areas of the county, by first-due area.

From the perspective of the WSSIWG, the ultimate goal of this initiative is to have extensive water supply information readily accessible to MCFRS unit and command officers. The GIS provides a "seamless" technology for transferring water supply data to a computerized geographical format. When MDTs are installed in MCFRS apparatus, the GIS water supply maps and corresponding data (when developed and inputted) will provide instant access to crucial information, including hydrant locations, length of hose lays from hydrants to specific addresses, locations of static water supply resources, and site plans for individual properties indicating the locations of hydrants, fire department connections, sprinkler system valves, and other site-specific information of interest. Through GIS and the MDT technologies, the unit/command officers might also have the capability to check the status of individual hydrants (in vs. out of service) via a data link with the WSSC Command Center in Laurel.

Implementation of this recommendation will involve the following tasks:

- Updating/revising existing WSSC data base indicating locations of hydrants
- Collecting data on locations of hydrants within the Rockville and Poolesville municipal water systems

- Collecting site data for individual properties on locations of privately owned fire hydrants, fire department connections, sprinkler system valves, and other fire suppression systems.

- Identifying static water supply sources county-wide and collecting information on access, ownership, and specific operational tactics regarding each water supply source. [GPS units could be used to pinpoint locations by latitude/longitude coordinates.] In addition, creating a data base to store this information.

- Developing GIS maps and site diagrams displaying water supply data, including length of rural lanes and driveways and corresponding supply line requirements.

- Placing maps and related information in binders (until the MDT is implemented), and placing these binders, having page protectors and alphabetical indexes, in all fire suppression units.

Impacts:

1. Ease of implementation:

Implementation of this recommendation will be dependent upon a significant long-term commitment of personnel and resources. Data collection will involve several personnel from every station and will be a considerable time commitment. Development of GIS maps and AutoCAD diagrams will require MCFRS firefighters/rescuers trained in ArcView and AutoCAD and/or one or more fulltime programmers trained in these same software applications. There will be a considerable need for guidance from the GIS Office, as well as the Maryland-National Capital Park and Planning Commission.

2. Fiscal:

To implement the provisions of this recommendation, funding will be required for the following resources and initiatives:

- Fulltime programmer(s)
- 5 Portable GPS units (about $350 each), one per MCFRS District
- Printing of maps and data
- Binders, with page protectors, for storing paper maps and hardcopy data

3. Legislative:

No legislation is required.

4. Policy/procedures:

A policy will be required to ensure standardization of maps and site diagrams.

5. Geographical:

The development and use of standardized maps and site diagrams will apply county-wide, including all station first-due areas.

Implementation Timeline:

Hardcopy maps and diagrams showing water supply information should be in place on all suppression units by FY02. The same maps, diagrams, and information should be available within the MDT system no later than FY04.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

2. The MCFRS Office of Fire Code Enforcement should develop an inspection procedure for use during in-service inspections for all buildings equipped with an automatic sprinkler system, standpipe system, and/or fire pump, that assures compliance with NFPA 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems."

WSSIWG Comments:

A standardized inspection procedure will ensure that all MCFRS personnel will be able to uniformly verify water-based fire protection system requirements. Proper functioning of these systems is essential to assure safe evacuation of the occupants, limit fire spread, and enhance the safe deployment of suppression personnel. Implementation of this recommendation will involve developing the inspection procedure and training firefighters to use the procedure. Increased interaction between the Office of Fire Code Enforcement and in-service units will assure the operational readiness and reliability of these systems.

Impacts:

1. Ease of implementation:

Development of the inspection procedure and a database by the Office of Fire Code Enforcement should be a fairly simple task. Training firefighters to use the procedure should not be difficult, provided that a comprehensive training program is developed and delivered through the Training Academy. A train-the-trainer approach may be suitable for this initiative. If laptops or handheld data entry devices were to be purchased for this initiative, then the complexity of the training program would increase and result in a longer course.

2. Fiscal:

The cost of developing the inspection procedure would be minimal. Training costs would be fairly low, particularly if a train-the-trainer approach were applied, utilizing in-service training programs already in place. If the data entry process were to be automated, there would be associated costs (to be determined).

3. Legislative:

No legislation is required.

4. Policy/procedures:

A standard in-service inspection procedure for water-based fire protection systems would have to be developed, based upon NFPA 25.

5. Geographical:

The procedure called for in this recommendation would apply county-wide.

Implementation Timeline:

The inspection procedure should be developed during FY01, and training of all MCFRS personnel should be completed by FY02. Once trained, personnel should begin using the procedure immediately. Laptops and/or handheld data entry devices could be phased in between FY02 and FY05.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

3. A contingency plan should be developed by the MCFRS that provides for adequate water supply for fire suppression throughout Montgomery County during times of catastrophic failure of any of the three municipal water systems serving the county.

WSSIWG Comments:

Regardless of the size of the three municipal systems, a catastrophic failure of any of the systems would severely limit the ability of the MCFRS to quickly suppress structure fires and to control large brush fires within the affected area. A contingency plan would address resources and procedures that would limit this vulnerability should a catastrophic failure occur. Implementation of this recommendation will involve developing the contingency plan, training personnel to implement the plan, and periodic testing and revision of the plan

Impacts:

1. Ease of implementation:

Development of the contingency plan would be a joint effort between the MCFRS, including the Emergency Management Office, and the three municipal water authorities serving Montgomery County. Coordination with the DPWT, mutual aid departments, the Council of Governments, the State (e.g., Maryland National Guard tankers), the Federal Government (e.g., Department of Defense tankers), and private-sector organizations may also be required. Involving outside agencies in plan development could prolong the time required to complete the plan. The training aspect of this initiative could be absorbed into the overall scope of the comprehensive water supply operations and training program addressed in Recommendation #2 under the "Training, Tactics and Operations" category. Periodic testing of the plan could range from a simple table-top exercise, to a full-scale functional exercise.

2. Fiscal:

The cost of developing the contingency plan would be minimal if in-house personnel were used. Training costs and the costs associated with testing the plan would be minimal, unless a full-scale functional exercise was conducted which could be costly if outside resources were called upon to participate. Should the plan ever be activated,

costs for deployment of outside resources could be high, depending upon the duration of the emergency.

3. Legislative:

No legislative action is required.

4. Policy/procedures:

Implementation of this recommendation will likely require the development of a new policy and related procedures, which could be absorbed into the overall scope of the comprehensive water supply operations policy addressed in Recommendation #2 under the "Training, Tactics and Operations" category. Due to the major risk reduction impact of this recommendation and the need for inter-organizational planning, an amendment to the *Fire, Rescue, and Emergency Medical Services Master Plan*, and the County Emergency Operations Plan, would also be in order.

5. Geographical:

The contingency plan should apply to the geographical areas of the county served by the three municipal water authorities, approximately 55-60% of the land area in the county. In view of the fact that all MCFRS units and DPWT units having water-carrying capability would likely be identified in the contingency plan as potential resources during a water emergency, activation of the plan could affect the entire county from a resource deployment standpoint.

Implementation Timeline:

The contingency plan could be developed in the FY01-02 time frame. Training of all MCFRS personnel, and initial testing of the plan, should be completed in the FY02-03 time frame.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

4. The MCFRS should develop a program to expand the use of dry hydrants in the rural portions of the county, incorporating NFPA 1231 guidelines as appropriate.

WSSIWG Comments:

Development and implementation of a dry hydrant program would require the formation of a work group to develop the program and to oversee the program on a long-term, continuous basis. The work group would have to devise a method of identifying suitable static water sources (possibly using the GIS) and contacting property owners to determine their willingness to participate in the program. In addition, the group would need to identify strategic sites in which to locate underground tanks. The WSSIWG would like to emphasize that although the future need for MCFRS tankers could be reduced, dry hydrants are not a substitute for mobile tanker water shuttle.

The proposed work group may wish to devise an incentive plan (e.g., property tax reductions) to encourage private property owners to participate, either allowing the County to install a system, or the property owner installing a system at their expense to address their own fire protection needs. The group may also wish to draft legislation requiring developers to install underground tanks with dry hydrants in non-hydranted developments meeting certain criteria. Once willing participants were identified, the group would need to coordinate with County contractors the installation of tanks, piping and dry hydrants as well as fire department vehicle access including turn-around areas. A legal agreement for construction and long-term MCFRS use of the water source/dry hydrant would have to be coordinated between the County and property owners, as well.

Finally, MCFRS tactics and SOPs for efficient/effective use of the dry hydrants and periodic maintenance of dry hydrants (i.e., checking caps and threads, clearing vegetation/debris, back flushing) would have to be addressed within the scope of the comprehensive water supply operations policy called for in Recommendation #2 under the "Training, Tactics and Operations" category.

Impacts:

1. Ease of implementation:

Because the program would be largely-dependent upon participation from private property owners, this initiative will require a great deal of coordination and time in both

the developmental and the long-term operational phases of the program. The need to establish and monitor contracts for installation of each dry hydrant will add to the complexity of the program. Developing and implementing the required training and maintenance will require a significant commitment of time and resources, as well. In view of these issues, the installation and availability of the initial dry hydrants established under this program would probably not occur until FY03. Additional installations would be envisioned to occur at a steady rate for about 10 years, and then drop off thereafter to only a few per year. If developers were required to install underground tanks with dry hydrants under certain scenarios, then a considerably higher number of systems would be expected over the long-term.

2. Fiscal:

It is anticipated that the County would have to pay for the installation of most, if not all, of the dry hydrants, including the construction of adequate means of MCFRS access. The cost of connecting a dry hydrant to a body of water will vary depending upon the length and diameter of piping required and the amount of fire department accessway that needs to be constructed. Installation of a large capacity underground water tank with a dry hydrant connection would cost between $31,000 for a 30,000 gallon tank and $45,000 for a 50,000 gallon tank.[3] Costs include the tank, piping, fittings, excavation, back-filling, and seeding. Occasionally, the property owner may be willing to cover the costs of a dry hydrant installation if they had extraordinary fire protection needs, but would probably find an automatic sprinkler system to be a more cost-effective approach. If developers were required to install underground tanks with dry hydrants under certain scenarios, they would bear the costs initially, and inevitably pass along the costs to new home buyers.

3. Legislative:

Legislation would only be required under two scenarios: 1) if the initiative was pursued of requiring developers to install underground tanks with dry hydrants in non-hydranted developments meeting certain criteria, and/or 2) if the initiative was pursued of creating tax incentives for individual property owners who voluntarily install a dry hydrant at their expense, or allow the County to install a system on their property for public use.

4. Policy/procedures:

A policy for expanding the use of dry hydrants in non-hydranted areas would be required. Related to this policy, SOPs would have to be developed for MCFRS use of dry hydrants and for their maintenance. As stated above, the dry hydrant policy would have to be addressed within the scope of the comprehensive water supply operations policy called for in Recommendation #2 under the "Training, Tactics and Operations" category.

[3] The Winfield Volunteer Fire Department located in Carroll County, Maryland, provided cost estimates. The estimates were obtained from a local contractor in October, 1999.

5. Geographical:

The expanded use of dry hydrants would apply to all non-hydranted areas of the county.

Implementation Timeline:

The proposed work group should be established early in FY01 to begin developing the dry hydrant initiative. By late FY01, the initiative should be defined and a plan for its implementation should be completed. Any proposed legislation should also be drafted. During FY02, any legislation should be presented to the County Executive and County Council, and the program's implementation plan should be initiated. By FY03, the initial dry hydrants established under this program should be in place, with others to follow in future years.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

5. The MCFRS should explore available Class B foam strategies and develop a plan to improve Class B fire fighting foam capabilities.

WSSIWG Comments:

While most pumpers in the county are equipped with 40 gallons of Class B foam, and four pumpers (E71, E81, E261, E281) have quantities of 100-250 gallons and around-the-pump foam capabilities, additional large volume foam capabilities are required for large-scale incidents involving flammable liquids. Incidents such as the 1992 tanker fire under the I-495 overpass at the I-270 Spur required the response of foam units from Dulles International Airport approximately 25-30 miles away. The risks throughout the county posed by trucks, trains and aircraft carrying flammable liquids, as well as fixed facilities storing flammable liquids, illustrate the need for Class B foam resources within the MCFRS that can provide quick response.

Several departments across the country (e.g., Dade County, Florida) have found foam trailers or skid-mounted foam systems to be a cost-effective alternative to a full-sized dedicated foam truck. Such foam trailers/systems typically carry 275-500 gallons of foam concentrate, and may also be equipped with built-in proportioners, foam nozzles and other foam appliances. These foam units are designed to work in combination with a strategically positioned pumper that provides the required water supply and handlines. If the foam unit is designed to simply carry foam, then a pumper with an around-the-pump proportioner is required. It has been suggested within the comments received that the county deploy two bulk foam trailers meeting the above description, one in the up-county area and one in the downcounty area. Nonetheless, the need for a full-sized dedicated foam truck should also be assessed and its advantages/disadvantages compared to those of trailers/skids.

Impacts:

1. Ease of implementation:

A work group, working in conjunction with the Apparatus Specifications Committee, would best achieve implementation of this recommendation. Using this scenario, implementation of this recommendation would be fairly easy, and could be accomplished in a short time frame (see "Timeline" below).

2. Fiscal:

Implementation of the plan for Class B foam strategies would require funding for the initial and recurring purchase of large quantities of foam concentrate, and the one-time purchase of a transport unit (i.e., skid, trailer, or dedicated truck) and foam-related nozzles and appliances. Funding may also be required for a utility vehicle to tow a trailer or carry a skid, specialized personal protective equipment (in addition to that within the HIRT inventory), and specialized training in the use of the chosen foam system. The following cost estimates are provided, keeping in mind that some items are alternatives for other items:

- 500 gallons Class B foam concentrate - $11,000-$12,500 ($22-$25/gallon)
- Foam trailer equipped with built-in proportioner, nozzles and appliances – Cost to be determined (TBD)
- Skid-mounted foam transport system – Cost TBD

3. Legislative:

No legislative action is required.

4. Policy/procedures:

Standard operating procedures associated with enhanced Class B foam capabilities would be required, addressing dispatch of the unit(s), operational tactics, and maintenance of the unit(s) and equipment. Theses SOPs would have to be addressed within the scope of the comprehensive water supply operations policy called for in Recommendation #2 under the "Training, Tactics and Operations" category.

5. Geographical:

A Class B foam strategy would apply county-wide, however, a dedicated foam unit would probably be placed at only one station to serve the entire county.

Timeline:

The development of a plan for a county-wide Class B foam strategy should be completed during FY01. Acquisition of foam apparatus and equipment, if approved, would probably occur during FY02. The overall program, including training, could be completed within the FY02-03 time frame.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

6. The MCFRS should move forward with the proposed risk analysis to be performed at the station response area or fire box area level, to fully identify fire-related risks.

WSSIWG Comments:

This recommendation originated from a similar recommendation appearing in the *Master Plan Priority Issues Study Final Report* published by the FRC in 1998. The report recommends that the analysis address all risks including fire, EMS, rescue, hazardous materials, and explosives. The intention of the WSSIWG is to utilize the fire-related findings of the risk analysis to determine where fire suppression resources should be placed to best minimize fire risks throughout the county.

Impacts:

1. Ease of implementation:

The Planning Subcommittee of the FTP Committee will oversee the station area risk analyses as part of Phase 2 of their Station Location and Resource Allocation Study. The Planning Subcommittee will begin by establishing a methodology and process that will be applied county-wide during the risk analysis project. It is envisioned that each Station Commander, working closely with the Chief of the LFRD, will be charged with overseeing the risk analysis performed within their station's first-due area, using standard criteria established by the Fire Administrator.

The Station Commander will establish a group of career and volunteer personnel to collect, analyze and summarize risk-related data, following the criteria established by the Fire Administrator and the standard methodology and guidance set forth by the Planning Subcommittee. A portion of this work could be accomplished through the Standard Training Program (STP) if STP sessions of this nature can be scheduled. The findings and results for each station area will then be further analyzed by the Station Location and Resource Allocation Work Group and the Research and Planning Unit, who will use this information as the basis for resource allocation recommendations to the FTP Committee and the FRC.

The process associated with the implementation of this recommendation is expected to be time consuming and involve a labor-intensive effort on the part of the entire MCFRS.

The success of this project will be dependent upon the support of senior management within the MCFRS and a system-wide buy-in from the rank and file. In addition, the Planning Subcommittee and the Station Location and Resource Allocation Work Group will have to provide clear and consistent guidance to participants to ensure the effort is well coordinated and successful.

2. Fiscal:

Implementation of this recommendation (i.e., performing the risk analysis) should have little, if any, fiscal impact. The work will be performed during normal duty hours, with the exception of possible overtime expenditures in certain instances. Implementation of resource allocation decisions that may occur as a result of the risk analysis could have a significant fiscal impact, but this impact is unknown at present.

3. Legislative:

No legislative action is required.

4. Policy/procedures:

Not required. Guidance on performing the risk analysis will be provided to participants.

5. Geographical:

The risk analysis will apply county-wide, but will be performed at the station first-due area level.

Implementation Timeline:

It is envisioned that the risk analysis will be initiated in FY01 and completed in FY02.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

7. The Fire Rescue Commission should initiate immediate action to correct the problems regarding FIRES/EMBRS compliance and the process for estimating fire loss.

WSSIWG Comments:

In its final report, the Water Supply Work Group states that it believes the number of structure fires and the resultant dollar loss are grossly under-estimated. It stated two reasons: 1) a significant non-compliance problem concerning the use of the automated incident reporting system; and 2) the incident commander and unit officer underreporting actual fires by using codes that indicate "good intent, smoke scare, hazardous condition, etc."

The WSSIWG concurs that incident data, as presently collected, is inadequate for the numerous purposes for which data can be used. In preparation of this report, it became apparent that useful data pertaining to structure fires and fire loss was not readily available. Statistical analysis based on incomplete data is suspect and can lead to unreliable and disputable conclusions and recommendations.

The WSWG and the WSSIWG took tremendous efforts to ensure that the data it used throughout the study was unbiased and representative of its charge. This extra effort, although necessary to ensure an unbiased report, was inefficient and would have been unnecessary had basic incident reporting measures been in place.

Although not a task specifically related to water supply and the charge of the WSWG/WSSIWG, the work group concludes that it is absolutely essential to report its findings concerning this problem and to make this recommendation to the FRC.

WATER SUPPLY RECOMMENDATIONS
"PLANNING AND TECHNOLOGY" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

8. The MCFRS should monitor the expansion and looping of water mains in the Damascus and Clarksburg areas, and, to the greatest extent possible, support increased water storage capacity throughout the WSSC High Zone.

WSSIWG Comments:

Presently, WSSC serves the Damascus area by a single 16-inch feeder main and the Clarksburg area by a separate 16-inch feeder main, both comprising the northern most portion of the WSSC High Zone. The two mains are not connected; thus the large area served by each main is extremely vulnerable to breaks or other water service disruptions, without the benefit of a looped network. In response to the upcoming large-scale development in Clarksburg, WSSC plans to expand the water delivery network in Clarksburg, and connect the Damascus and Clarksburg feeder mains to form the much-needed loop. Plans also include adding a 1 million gallon elevated water tank near the Interstate 270/Route 121 interchange.

Water storage capability within the WSSC High Zone presently totals 43.5 million gallons. Considering the average daily demand for municipal water throughout the WSSC High Zone, the WSSIWG believes that the High Zone lacks sufficient water storage capabilities to maintain adequate volume and pressure in the system for both domestic and MCFRS use should a major disruption in supply from the WSSC Filtration Plant occur. The WSSC High Zone would be the first portion of the system affected by a failure due to elevation. Additional storage capacity would help to alleviate this perceived deficiency.

Impacts:

1. Ease of implementation:

The task of monitoring water system expansion and looping in the Clarksburg and Damascus areas should be easy to accomplish. Although initiated with the WSSC, this task will require periodic coordination with WSSC and regular site visits by MCFRS personnel.

The coordination of water delivery/storage improvements in the High Zone will be considerably more difficult and time consuming. For the desired improvements to occur,

the MCFRS will have to provide convincing arguments to WSSC and the County Council due to the high-cost capital improvements that would be required. The best way to approach this task may be to address it in combination with the implementation plans for Planning and Technology Recommendation #3 (contingency plan for failure of municipal water system) and Recommendation #1 under Interagency Coordination.

2. Fiscal:

The implementation of this recommendation would have no fiscal impact on the MCFRS, since on-duty MCFRS staff will accomplish it. WSSC, and its customers, would bear the costs.

3. Legislative:

No legislative action is anticipated.

4. Policy/procedures:

New policies and proceduresare not required.

5. Geographical:

Applies to portions of the county that are served by the WSSC High Zone, with emphasis on the Clarksburg and Damascus areas.

Implementation Timeline:

Monitoring of water system expansion and looping within the Clarksburg and Damascus areas has been initiated (since expansion is in progress) and should be continued until all major water mains are installed. The effort to increase water storage capacity within the WSSC High Zone should be initiated in FY01 and continued until the MCFRS is satisfied that storage capacity is sufficient to ensure availability of a reliable and uninterruptable water supply for fire suppression.

WATER SUPPLY RECOMMENDATIONS
"INTER-AGENCY COORDINATION" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

1. Improve planning and working relationships with the three municipal water authorities serving Montgomery County.

WSSIWG Comments:

As the WSWG discovered while conducting the Water Supply Study, there has been little, if any, regular contact during the past ten years, or longer, between the MCFRS and the three municipal water authorities serving Montgomery County (i.e., WSSC, Rockville, Poolesville). This lack of communication and coordination has led to a number of issues involving hydrant maintenance, low-flow hydrants, lack of notification of water mains undergoing long duration repair/replacement, and, from the MCFRS perspective, a lack of water storage facilities throughout much of the county. While these issues do not apply globally to all three municipal systems, they are of significant magnitude to have adversely affected fire suppression operations in certain cases, or present a potential for the same.

Regular contact between the MCFRS and the municipal water authorities would have a positive impact on existing issues, and would serve to prevent similar issues from arising in the future. The MCFRS should take the initiative to improve planning and working relationships with the three municipal water authorities by building upon the initial contacts that were made between the WSWG and representatives of the WSSC, Rockville, and Poolesville water systems. **The WSSIWG recommends that the MCFRS establish a permanent liaison with each of the three municipal water authorities to improve planning and working relationships**.

Impacts:

1. Ease of implementation:

The recommendation to improve planning and working relationships with the three municipal water authorities should be fairly easy to implement. Establishing a permanent MCFRS liaison with each of the three municipal water authorities, should facilitate long-term improvements in water system planning as it relates to fire suppression operations, and foster a positive, long-term working relationship between the organizations.

2. Fiscal:

Assuming the liaison responsibility was assigned to an existing MCFRS employee as an additional duty, there would be no fiscal impact. It is envisioned by the WSSIWG that the liaison responsibility would require approximately 10-25% of a work year.

3. Legislative:

No legislation is required.

4. Policy/procedures:

Due to the importance of having an adequate and reliable municipal water system to support fire suppression requirements, and the need for inter-organizational planning to achieve this objective, an amendment to the *Fire, Rescue, and Emergency Medical Services Master Plan* is in order. In addition, policies and procedures may need to be developed to implement any programs and initiatives resulting from the planning process.

5. Geographical:

The recommendation applies to the three existing municipal water authorities serving the county, and would also apply to any additional municipal water authority that may serve the county in the future.

Implementation Timeline:

The WSSIWG recommendation to establish a permanent liaison with each of the three municipal water authorities should be implemented as early as possible during FY01. The general recommendation to improve planning and working relationships with the three municipal water authorities should commence immediately and be pursued on a continuous basis from that point forward.

WATER SUPPLY RECOMMENDATIONS
"INTER-AGENCY COORDINATION" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

2. Coordinate with the three municipal water authorities MCFRS review of their hydrant flow records on a regular basis.

WSSIWG Comments:

Based upon actual incident experience and information provided by the three municipal water authorities serving the county (i.e., WSSC, Rockville, Poolesville), the WSSIWG is aware that certain hydrants have insufficient flow rates and/or operating pressures. To ensure that the MCFRS is kept abreast of hydrants having these deficiencies, and in an effort to correct these deficiencies, a process must be established whereby the three municipal water authorities present their hydrant flow test results to the MCFRS on a regular basis. Development and coordination of this process could be assigned to the proposed MCFRS water supply liaison (see discussion in Recommendation #1 under Inter-Agency Coordination above). The MCFRS water supply liaison would then distribute hydrant flow records to MCFRS station commanders and Chief Officers for tactical consideration.

Impacts:

1. Ease of implementation:

This recommendation should be fairly easy to implement, provided that the water authorities are cooperative in releasing data. Establishing a permanent MCFRS liaison with each of the three municipal water authorities, as proposed in Recommendation #1 under Inter-Agency Coordination, should facilitate this process.

2. Fiscal:

Assuming the proposed liaison responsibility was assigned to an existing MCFRS employee as an additional duty, there would be no fiscal impact

3. Legislative:

No legislation is required.

4. Policy/procedures:

A procedure would need to be developed for disseminating, on a regular basis, hydrant flow data to the 31 fire stations in the county that operate engine companies. The procedure would also have to address follow-up required on the part of the Chiefs and station commanders to pre-plan fire fighting tactics for areas where deficient hydrants are located.

5. Geographical:

The recommendation applies to the three existing municipal water authorities serving the county, and would also apply to any additional municipal water authority that may serve the county in the future. The dissemination of hydrant flow data would apply to the 31 fire stations in the county that operate engine companies.

Implementation Timeline:

This recommendation should be implemented as early as possible during FY01 and be pursued on a continuous basis from that point forward.

WATER SUPPLY RECOMMENDATIONS
"INTER-AGENCY COORDINATION" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

3. Encourage the WSSC to improve maintenance efforts regarding fire hydrants throughout their system, and to update the process for notifying the MCFRS of out-of-service hydrants.

WSSIWG Comments:

WSSC stated that the nearly 19,000 fire hydrants within its bi-county system are inspected and maintained on a two-year cycle. The WSWG questions this claim regarding WSSC hydrants located in Montgomery County. Based upon the experiences of MCFRS personnel, often times WSSC hydrants are so difficult to open that hydrant wrench extension bars are employed to open the operating nut or to remove caps, thus requiring more time and effort during fire fighting operations. Regular inspection and lubrication would resolve such problems.

Another issue regarding WSSC is the apparent lack of notice to the MCFRS concerning out-of-service hydrants. The notification, in general, has been inconsistent in recent years. Furthermore, the MCFRS has not been receiving advanced notice of WSSC plans for temporary aboveground mains employed during extensive system repairs/upgrades. Firefighters may not know of their existence until they have arrived at a fire incident and find hydrants with low pressure/flow fed by these temporary mains.

Impacts:

1. Ease of implementation:

This recommendation is closely related to Recommendation #1 under Inter-Agency Coordination, and could be addressed in combination with that initiative to improve planning and working relationships with the municipal water authorities serving Montgomery County. The proposed MCFRS water supply liaison would take the lead in impressing upon the WSSC the importance of improving its fire hydrant maintenance program and its process of notifying the MCFRS of out-of-service hydrants and plans for installing temporary water mains.

2. Fiscal:

No fiscal impact on the MCFRS is anticipated.

3. Legislative:

No legislation is required.

4. Policy/procedures:

An updated procedure may need to be developed for disseminating information to the field about out-of-service hydrants and water authority plans for installing temporary aboveground water mains. The procedure would also have to address follow-up required on the part of the Chiefs and station commanders to pre-plan fire fighting tactics for areas where temporary mains will be in service for extended periods, or where hydrants may be out of service for several days.

5. Geographical:

The recommendation applies to the areas in the county served by WSSC, but could also apply to other municipal water authorities serving the county in the future. The MCFRS dissemination of information concerning the status of hydrants and water mains would apply to the 31 fire stations in the county that operate engine companies.

Implementation Timeline:

This recommendation should be implemented as early as possible during FY01, and be pursued on a continuous basis from that point forward with all of the municipal water authorities serving the county, as necessary.

WATER SUPPLY RECOMMENDATIONS
"INTER-AGENCY COORDINATION" CATEGORY

WSWG RECOMMENDATION ENDORSED BY WSSIWG:

4. The MCFRS, State Highway Administration, and other appropriate authorities should address the problems concerning the dry standpipe running the length of the American Legion Bridge at Cabin John.

WSSIWG Comments:

As explained in detail on pages 51-52 of the WSWG Draft Report, use of the dry standpipe running the length of the American Legion Bridge presents many tactical concerns. The time and effort required to fill the standpipe, considering all required tasks and complications, render the system of limited utility. With the exception of a long-duration incident (e.g., overturned tanker, or tanker fire) where time may be available to fill the standpipe, the system would offer little advantage to fire fighters.

To alleviate some of the problems associated with the bridge's dry standpipe, and to make its use more advantageous to firefighters, coordination will be required between the MCFRS, State Highway Administration (SHA), David Taylor Naval Research Center Fire Department, National Park Service (which owns/maintains the Clara Barton Parkway under the American Legion Bridge), and other appropriate authorities.

Impacts:

1. Ease of implementation:

This recommendation could be difficult to implement, since the problems are significant, resolution would require a joint effort of several county, state and federal organizations, and the costs could be high. The MCFRS would need to establish a work group to coordinate this effort, with representatives of the Cabin John Park Volunteer Fire Department, the FRC's Operations and FTP Committees, and other fire service organizations wishing to participate.

2. Fiscal:

Implementation of this recommendation should have no fiscal impact on the MCFRS. Should the effort lead to recommendations for infrastructure improvements to the water supply system on the bridge, costs could be significant and would likely be borne by the SHA and/or other state or federal agencies.

3. Legislative:

No legislation is required.

4. Policy/procedures:

Whether infrastructure enhancements occur or not, a standard operating procedure (SOP) for MCFRS use of the bridge's water supply system is required. The SOP would become part of the comprehensive water supply operations policy addressed in Recommendation #2 under the Training, Tactics and Operations category.

5. Geographical:

The recommendation applies only to the American Legion Bridge at Cabin John; however, the proposed SOP would be applicable to any MCFRS personnel and apparatus deployed to an incident on the bridge.

Implementation Timeline:

Because this recommendation is of a lower priority than most of the WSSIWG's recommendations, it is envisioned that the proposed MCFRS work group would be established during FY01. Anticipated infrastructure enhancements, which would have to be included in the responsible agency's (e.g., SHA's) capital budget, would extend the implementation date of this recommendation to the FY02-05 time frame.