Northwest Fire Services

PROPOSED TREATMENT OF INVASIVE SPECIES FOR FIRE APPARATUS

Introduction to the problem

United States is experiencing a devastating attack from various small invasive species of mollusk called Zebra and Quagga Mussels. Originally introduced from Eastern Europe through the Great Lakes, mussels have spread rapidly throughout lakes and river systems of the United States and in 2016 found their way into Montana and other neighboring states.

Definition of the problem

As fire crews move back and forth across the state and also from one state to another, firefighting equipment represents an excellent vector or vehicle for transmitting invasive species by transfer of residual water among water sources, i.e., hydrants, lakes and streams. Strike teams and responding fire departments interact with each other, presenting the potential for cross-contamination of their engines and tenders throughout the firefighting process. This is unfortunately an excellent way for invasive species to be transported from one region to another, if they are not dealt with by decontamination at each location. In addition, as fire crews go back to their home station and possibly pull water from hydrants, there is a remote chance that there could be contamination in the public water systems via pressurized lines that are hooked up to hydrants that don't have ample pressure. Once introduced, invasive mussels have a devastating effect on native species, smothering native mollusks, fouling the spawning grounds of fish, and fundamentally altering the ecosystem and its endemic flora and fauna. Contamination of natural water supplies such as lakes and streams presents a clear and serious threat to the health and stability of fragile, natural ecosystems.

Example 1 of the problem (Introduction of Invasive Species to Public Water Supply)

A water tender pulling water out of the Missouri River could unknowingly infect itself with Zebra Mussels and other invasive species while transporting water to fire engines and brush rigs. After possible contamination of all equipment, they return to their home station where the invasive species could grow and survive, not only in their tanks and pumps, but also in their hoses.

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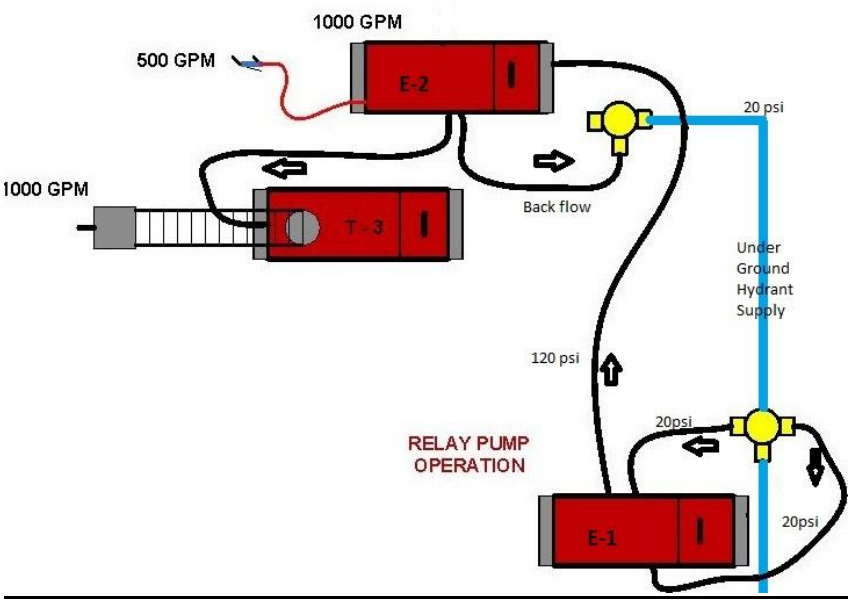
In a relay pumping scenario, with multiple engines drafting from multiple hydrants, the first engine may pull the hydrant supply down to 20 psi (which they should not do, but has happened), while supplying the other engine at 120 psi. The second engine would be hooked up to a different hydrant for additional water supply on the same hydrant system. That hydrant pressure is now drawn down to 20 psi from the first engine pumping. This scenario could allow a back-flow that would contaminate the water supply, as the second engine is now 100 psi over the hydrant's pressure. This would end up back-flushing the hydrant and public water supply. Although by training and procedures this should not happen,it is possible, as most departments are staffed by volunteers who lack extensive fire pumping skills and training. This is by no means their intention, but it is a very real possibility for introducing Zebra Mussels and other invasive species into a public water system.



Example 2 of the problem (Introduction of Invasive Species to a Natural Water Supply)

The same water tender has returned to its own district and is called out on a fire in a rural setting. That tender will more than likely fill out of a pond or creek. In the process of filling the tender you must use a primer pump that induces the suction to supply. In some cases the primer pump does not work. One of the tricks to priming, without a working primer system, is to backflush the pump and suction line to remove the air in the line and induce a proper draft to fill

the tank. The only way to induce a suction without a primer is to backflush the system. This would allow contamination of the water source that the water tender is attempting to draft from, and possibly transmit invasive species into that water source.

What a treatment should be for a potable water non-corrosive system.

Any chemical used to treat water that will have contact with a piece of fire apparatus should be potable, safe, and easy to implement without having hazardous chemicals or by-products involved, and should be capable of being applied in a timely manner with means of verification of treatment. Fire trucks are part of the water system, although many people do not understand how fire trucks and water tenders operate. They constitute part of the national water system, i.e., river and lakes, and are also part of the public water system, i.e., hydrants. The owners of Northwest Fire Services (NWFS) have experience working around the fire service for 50+ years. The control of invasive species in the fire service is a priority for us as we pump-test fire departments throughout the northwest United States.

In January of 2017, National Wildfire Coordinating Group wrote a proposed treatment of fire apparatus on fire grounds PMS 444. I reviewed this and found the chemicals and solutions they are proposing to be harmful to the equipment and to the environment. The treatments proposed by the National Wildfire Coordinating Group would include, per Page 7 of the PMS 444 guidelines:

1. Power wash contaminated surface for 2 minutes with 140-degree hot water.
   a. This procedure would not be effective as you will never get all the infected surfaces at 140 degrees (all tanks inspected for use for Federal and State fire fighting has to be baffled with bulkheads or baffle balls).
   b. The high temperature that needs to be maintained is delaminating to the fiberglass tanks and is harmful to hoses, poly tanks, and seals.
2. Dry the gear in hot sun until dry to touch.
   a. You will not dry up all areas of the tank and pump.
3. Use of chemical solutions.
   a. Clorox bleach (corrosive).
   b. Spartan Super HDQ Neutral 1204 (corrosive).
   c. Spartan GS High Dilution Disinfectant 256 (corrosive).
   d. Spartan GS Neutral Disinfectant Cleaner (corrosive).

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All these proposed products are considered corrosive and could react with other chemicals to cause unintended hazardous environmental consequences, and to create by-products that are not safe for humans. Furthermore, none of these products is labeled for use against the target pests, i.e., invasive mussels.

We need to look at chemicals proven to be safe for potable water and that have no disposal issues, and that will effectively treat not only during the treatment process, but will reside in the pumps and hoses to allow the continuing treatment of the equipment.

NWFS has found several chemicals that meet this requirement and propose introducing them to the fire service. One chemical is EarthTec QZ, which is a suspended copper sulfate product that has an outstanding history of controlling mussels and invasive species in open water and in water treatment facilities throughout the United States.

Proposed Treatment Plan for Northwest Fire Services Treating Wildland Equipment

Northwest Fire Services has a unique 5,000-gallon stainless steel tanker that can service up to seven engines or tenders. Our tanker is designed for pump testing for ISO certification and is set up for Type I support tender operations. It is also uniquely designed for treating aquatic invasive species. NWFS proposes to circulate a potable water chemical solution (suitable for pools and drinking water) that kills veliger and adult Zebra Mussels along with Eurasian Watermilfoil and others over a period of 24 to 48 hours. NWFS can provide a certificate with date and time upon completion of treatment to each fire engine and tanker. We have come up with a detailed treatment procedure to stop the spread and distribution of invasive species in the fire service. We would like to review that procedure with state and federal agencies.

Supporting Documents

Invasive Mussels Wildlife Federation

Guidelines to Preventing Aquatic Invasive Species Transport by Wildland Fire Operations PMS 444

Safety Data Sheets for Chemicals

Technical Sheets for EarthTec QZ

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NSF Trademark

Presentation of EarthTec QZ Successfully Controls Zebra Mussels at the Intake of a Major Municipal Water Treatment Plant

Latest: Invasive Zebra Mussels have reached Montana December 20, 2016

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