



Wildland **FIRE HYDRANTS**

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**Wildland Fire Hydrants (WLFH) is a Spokane, Washington based
Emergency Equipment Rental Agreement EERA,
Call When Needed, Incident Only, Non-VIPR Vendor supplying
TENDER FILLING SYSTEMS, ENGINE FILLING SYSTEMS
& TASK FORCE FILLING SYSTEMS.**

Wildland FIRE HYDRANTS

WLFH PLUG & PUMP SYSTEMS

Incident situations and requirements are constantly changing, which is the very reason **Wildland Fire Hydrants Plug & Pump Systems** were developed. System capabilities were designed to be flexible and easily expandable, adapting to various changing incident requirements and environments.

Plug & Pump is a Water Handling capability designed to improve the distribution of water resources, assisting the wildland firefighting effort, air operations and ground support by increasing the number of vehicles filled per hour with a system designed to expand piecemeal to provide the necessary flow and fill rate to reduce Fill Time, Wait Lines, Drive Time and overall Turnaround Time.

Systems are designed to operate at Hose Flow Volume with a GPM rate and a vehicle fills per hour rate that is greater than any water fill system currently in use. A small footprint to allow for greater water source access points, able to increase capabilities as needed to ensure time saving filling times, and a myriad of configuration possibilities that are designed to meet any situational requirements. System components consist of combining existing technologies, modified to adapt to this application.

Maximum capabilities limited by resource availability and vehicle fill spot availability. Fill spots could easily be where the line would form.



Boulder Mountain

WLFH CAPABILITIES STATEMENT

WLFH Crews dispatch with additional Crew and internal Equipment Cache until the System is operational and incident requirements met. Once operational, crew size will reduce. Some configurations and Incidents may allow for single crew member operations, most configurations will require two crew members while larger configurations would require additional crew. Final crew required TBD on site.

WLFHs dispatch equipment cache consists of 2 separate dual-pump, continuous flow configurations with 5-10 Direct Fill connections, 3-4 Indirect Fill towers and Backup Pump. Cache is available to deploy with remaining equipment to an additional site or separate Incident.

System expands piecemeal allowing any one pump to combine with others in Tandem or Multi-Pump operations with Single or Continuous Flow with the appropriate number of Direct Hose Connection and/or Indirect Overhead Fill Towers.

All Systems are high volume/low pressure (max 2500 GPM@less than 38 PSI).

Remote Operations- Able to be self-sufficient with the level of support TBD on scene.

Crews camp with equipment.

Hoses and equipment sanitized in accordance with NWCG guide.

Pumping in accordance with Salmon-Challis National Forest requirements.

Capabilities based on 75% optimal pump flow, less than 100' discharge hose.

Filling System configurations have a myriad of DISTRIBUTION and PUMPING GPM options designed to drastically increase tanked vehicles maximum effectiveness by reducing filling time and reducing or eliminating vehicle wait line times as well as being able to access considerably more water sources, if it can be walked to, it can be accessed. A closer water source also shortens drive times.

It all starts with the scalable Distribution system which can be configured for continuous flow able to "tank" every gallon pumped whether via indirect overhead fill or direct hose connection.

3 inch Hand Valve with 2, 2 ½ and 3 inch hose connections with a restricted flow of no more than 225 GPM.

3 inch fill pipe connection capable of 400 GPM,

4 inch overhead capable of 1,000+ GPM Indirect Fill for larger tanked vehicles.

The Pumping System GPM is also scalable from 400 GPM to 2,000+ net GPM. System psi would be determined by set-up configuration, pumping conditions would vary but not exceed 38 psi. Preferred operating psi of 16-24.

A portable fire hydrant that is able to access the resource, hose line able to reach hundreds of feet for vehicle fill spots, with the ability to configure the pumping system (GPM) to the required distribution system (# direct fill connections and indirect) to accomplish desired result (GPH, # vehicles tanked). Configuration set-up time is dependent on requirements, it could take two hours plus to have a system fully operational, limited pumping operations possible within an hour. Once assembled, tear down and re-set of the same configuration are considerably less than initial set-up time.

WLFH SPECIFICATIONS

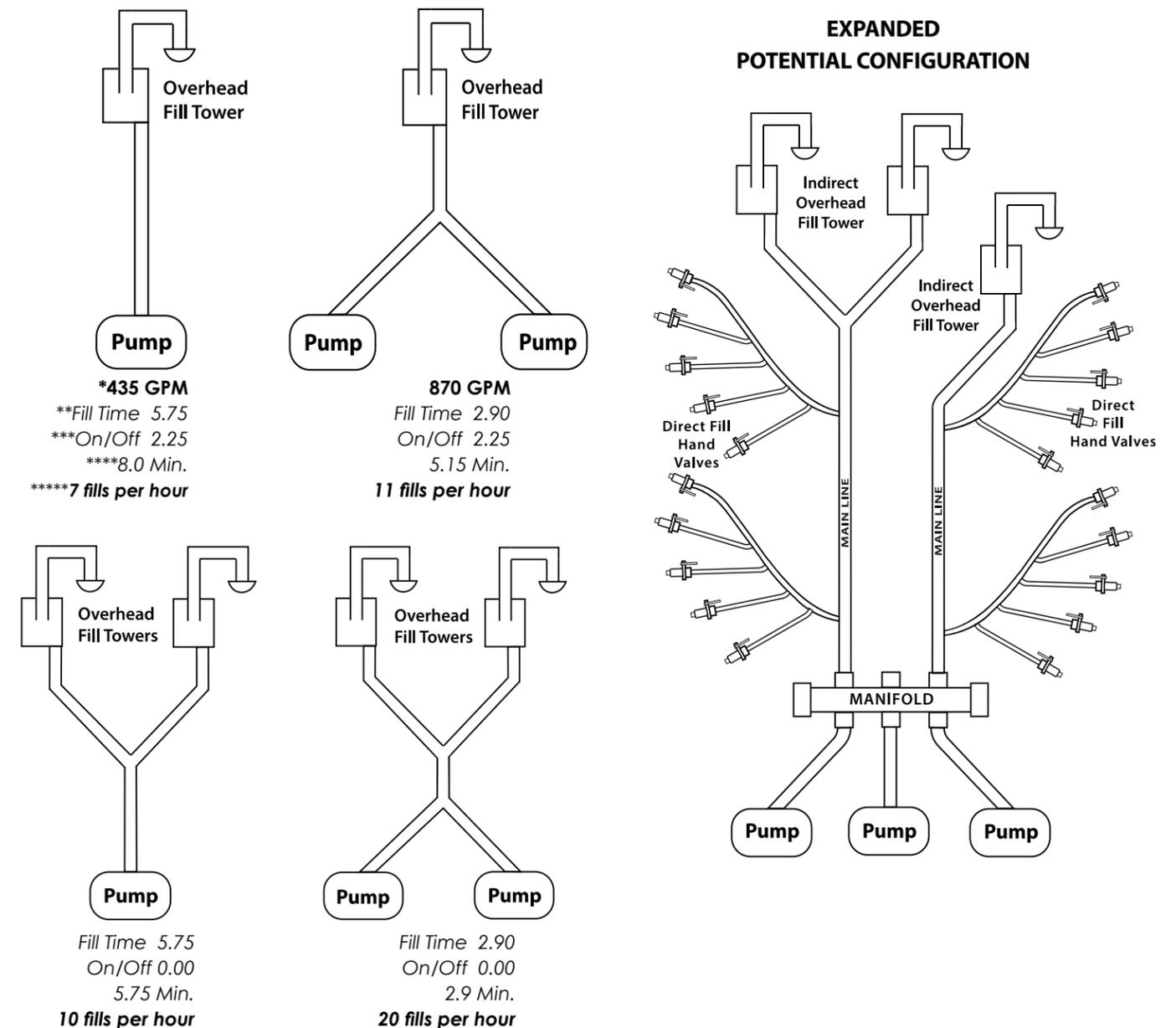
Single and Tandem or dual pump configurations are limited to what the pumping situation allows. Most setup would range from 300-800 +GPM.

Single configurations would have an appropriate number of direct fill hose connections based on 200 GPM per connection. continuous flow configuration would require additional connections.

Indirect fill requires a single Overhead Fill Tower, two Towers for continuous flow.

Single flow configurations Vehicles would pull on and off after each other on a single discharge line. Continuous flow configurations would have multiple discharge lines. Discharge lines may be Direct and/or Indirect Fill.

SEE ILLUSTRATIONS BELOW: Shows Single vs. Continuous Flow, Single vs. Double Pump, Single vs. Double Overhead Fill Tower. *580 Pump@75% =435GPM - **Time to fill 2500 gallon tender - ***Vehicle pull on/pull off time - ****Per unit fill time - *****Unit fills per hour.



WLFH SPECIFICATIONS

Multi pump configurations of three or more pumps require a MANIFOLD and REMOTE CONTROL.

Manifold allows for a 4 inch 1000 GPM MAIN-LINE capability distributed to 3 or 4 separate DISCHARGE-LINES configured to direct or indirect fill.

Remote Control of pumps and valves for near instant control of flow and rate, which allows for a managed flow rate up to 2500+ NET GPM.

Each Main-line capable of 3-4 Discharge-lines connected to Direct and/or Indirect Filling configurations to allow for a constant flow in rotation.



The first set-up for proof of concept testing, configurations do not resemble this setup as improvements have been made, the general idea is there.

Tender Filling Systems with indirect fill connections are flexible and easily expandable from a single pump and Overhead Fill Tower configuration into a variety of multi pump, multi fill tower configurations.

Configuration capabilities base on 2,500 gallon fills and range up to 60 Tender fills per hour.

Tender Filling Systems are capable of a greater discharge flow up to 1400+ GPM. Vehicles with dry tanks would have the GPM gradually increase as the tank level rises.

Engine Filling Systems with Direct Fill via 2, 2.5 & 3 inch hose connections. Individual hose connections are RESTRICTED to less than 225 GPM. Designed to deliver 200 GPM @ less than 20 psi with a variety of configurations to provide what is required.

Configuration capabilities based on 500 gallon direct fills and range to 240+ fills per hour.

Systems designed to have a discharge connection for every 200 gallons of net pumping volume.

WLFH SPECIFICATIONS

Task Force Filling Systems are a blend of the Tender & Engine Filling Systems with Direct and In-direct fill connections. Designed to fill anything that comes along.

Configuration capabilities based on 5 - 500 gallon direct fills and 1- 2,500 gallon indirect fill and range up to 120 direct fills and 24 indirect fills per hour.

WLFH EQUIPMENT AND CREW

Pumps:

13 HP Honda BE Power Equipment BE-TP4013HM - 4 inch trash pump, 580 MAXIMUM GPM. 26 foot suction pull, 69 foot discharge push, 95 foot total lift.

The TP4013HM is WLFHs base pump, a capable and reliable pump which two or three of them together can solve your worst pumping difficulties. Each pump has its own oversized suction strainer so high volume pumping operations do not operate with a single intake, resulting in considerably less suction pull which is not as intrusive to the habitats the pumps are operating in.

13 HP Honda Echo Bearcat 4422 - 4 inch water pump, 422 MAXIMUM GPM. 26 foot suction pull, 72 foot discharge push, 98 foot total lift.

The 4422 is WLFHs backup and kicker pump for multi-pump manifold configurations,

All Pumps include: 50 feet suction hose, oversized suction strainer screened in accordance with Salmon-Challis National Forest requirements, one-way Foot Valve to maintain constant prime, containment berm, associated fittings, signage.



Pair of 422 and 580 pumps.

WLFH EQUIPMENT AND CREW

Indirect Fill Connections:

4 inch custom designed and fabricated aluminum Overhead Fill Towers proven flow rate of 1,400+ GPM, a foot-print of less than 8'x8' allowing for set-up in tight spaces, lightweight at less than 100 lbs dry, assembled and disassembled in less than 30 minutes.

Towers have 12' downspout clearance with 8'8" arm that swivels 360°.

Comes with traffic cones, reflectors, signage, night lighting and Flagstaff.



3 Overhead Fill Towers



Final design of Overhead Fill Tower at Boulder Mountain

WLFH EQUIPMENT AND CREW

Direct Fill Connections:

3 inch Hand Valves with associated 10' of hose and fittings that are designed to restrict, reduce and slow the flow to deliver 200 GPM at less than 20 psi, restricted to less than 225 GPM at maximum 38 psi.

Hand valve reduces to 2.5 & 2 inch connectors.

Current 2 and 3 inch M/F cam-loc fittings, 2.5 inch M NH fitting.

Comes with traffic cones, reflectors, signage and night lighting.



Hand valve with 2.5" m NH fitting



3" Hand Valve with m/f Cam-loc, 2.5" m NH and 2" m/f Cam-loc fittings

WLFH EQUIPMENT AND CREW

Manifold:

6 inch 8 Port custom designed and fabricated Manifolds are necessary to harness the power and flow of 3 or more pumps to provide the necessary "NET" water flow rate.

Single Main-line allows a "NET" or requested flow rate of 1000-1400 GPM.

Dual Main-line allows a "NET" or requested flow rate from 2000-2500 GPM.

Triple Main-line with a variable flow rate of 2500+GPM,

Manifolds are able to daisy-chain together for 5K++ GPM configurations.



Pair of single manifolds



Pair of daisy-chained manifolds

Hose:

4 inch rigid hose for foot valve to pumps.

4 inch water hose for pump to manifold.

4 inch lay-flat hose for pump and manifold to main line and discharge lines.

Generous 4 inch hose allotment of 300-900 feet depending on set-up configuration.

WLFH EQUIPMENT AND CREW

Remote Control System:

Custom designed and manufactured specifically for this application. Wireless controller allows a single System operator to have real time control of pumps and valves plus has an emergency all stop switch. R/C also allows for greater distances between water source, water pumps and discharge configurations. This is highly recommended for multi pump configurations as without R/C the additional crew that would be required could make the options and cost of operations impractical.

All Systems are always able to operate without R/C, or manually.

Knife Gate Valves:

To isolate flow to Discharge hose-lines from the Main hose-line.

Crew Members:

Crew Members have RT-130 training and required PPE with the EXCEPTION to Nomex clothing and Fire Shelter, to be provided per EERA.

WLFH is appreciative of the opportunity to provide this service to Region 4 and working with the firefighters to refine our capabilities.

If you would like to discuss the System, have any questions, input or concerns, please reach out to me via email, text or phone, I am at your service.

Have a safe 2023 season,

L.M. Lenny Lemmond

L.M. (Lenny) Lemmond, Owner
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