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# Franklin County Firefighter's Association
# Ottawa, Kansas

## Rural Water Supply Operations Seminar
## 2-hr Water Supply Drill
## August 25, 2013
## Summary Report

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# The Purpose

- The purpose of the seminar and drill was to review the basics of rural water supply operations and to practice water supply operations in a non-hydranted setting.
- The drill also allowed mutual aid companies to work together in a real-life training situation.

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# The Seminar

- The 2-day seminar started on Saturday with a 4-hour classroom session to review the basics of rural water supply operations.
- The review session was held at the Franklin County Fairgrounds in Ottawa, Kansas.
- Once the classroom part was over, the seminar continued with several hours of practical work on fill-site and dump site operations.
- The program concluded on Sunday with the 2-hr ISO tanker shuttle exercise and program review.
- Seminar participants were from the Franklin County area.
- Instructors for the seminar were Mark Davis and Alan Butsch.

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# The 2-hour Water Supply Drill

- The tanker shuttle drill was held on August 25th at L.O.H. Fire Station in Ottawa Township.
- The drill attempted to replicate the 2-hour Water Supply Delivery Test used by ISO in their evaluation of fire department water supply capabilities.
- While everyone in the fire service may not agree on ISO's evaluation of fire department capabilities, the 2-hour test is still a reasonable standard by which fire departments can compare their water supply operations.

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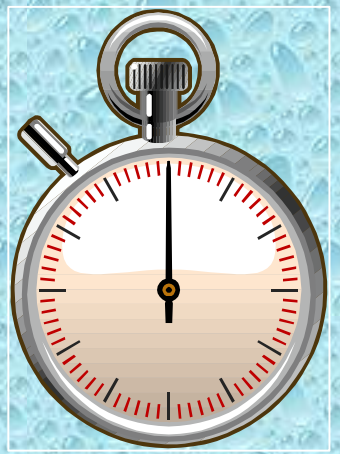
# The ISO Test

- The ISO 2-hour Water Supply Delivery Test has three critical time segments:
  - 0:00 to 5:00 minutes
  - 5:01 to 15:00 minutes
  - 15:01 to 120:00 minutes



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# ISO Test *0:00 to 5:00 Minutes*

- A drill location is selected and the units due to respond on the first-alarm assignment are dispatched.
- Time starts when the first engine arrives on the scene and comes to a complete stop.
- There is no requirement to flow water during the first 5 minutes, but the crew must be prepared to flow water once the 5-minute mark is reached.

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# ISO Test *5:01 to 15:00 minutes*

- At the 5-minute mark, a flow of at least 250 gpm must be started - and it must be sustained.
- During the next 10-minutes, crews can work to further develop their water supply and increase their flow, however…
- At the 15-minute mark ( 5+10), whatever amount of water is flowing at that time must be maintained for the remainder of the 2-hour test.

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# ISO Test *15:01 to 120:00 minutes*

- Once the 15-minute mark has been reached, the remainder of the 2-hour test is really just about ***sustaining*** the flow.
- The ISO test includes the simulation of automatic mutual aid response and allows additional water supply units to arrive and assist in the delivery process as would happen on a real incident.
- The real advantage of the ISO test is that it gives a fire department the chance to see where improvements can be made in their water supply delivery process.

It is one thing to say that your fire department can deliver 500 gpm for two hours – it is another thing to prove it in a real-life drill scenario!

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# Water Supply Drill Participants

- *The participants for the drill were from eight different fire departments and the water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in the L.O.H Fire District.*

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# Drill Participants

- L.O.H. Engine 3651
  - 1,250 gpm pump w/1,000 gal tank
- L.O.H. Engine 3652
  - 1,500 gpm pump w/1,500 gal tank


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# Drill Participants

- L.O.H. Engine 3653
  - 750 gpm pump w/3,500 gal tank

- L.O.H Tender 3661
  - 750 gpm pump w/4,000 gal tank

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# Drill Participants

- L.O.H. Tender 3662
  - 250 gpm pump w/3,200 gal tank
- Pottawatomie Tender 3361
  - 750 gpm pump w/3,000 gal tank

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# Drill Participants

- Centropolis Engine 3851
  - 1,000 gpm pump w/800 gal tank

- Centropolis Tender 3861
  - 1,600 gal tank


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# Drill Participants

- Pomona Engine 3952
  - 1,000 gpm pump w/1,000 gal tank
- Pomona Tender 3961
  - 300 gpm pump w/2,500 gal tank



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# Drill Participants

- Wellsville Tender 3761
  - 1,000 gpm pump w/1,800 gal tank


- Cutler Grass 3571
  - 400 gpm pump w/250 gal tank


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# Drill Participants

- Pomona Grass 3972
  - 400 gpm pump w/250 gal tank

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# Preparation

Units began the day at the fairgrounds where they received a briefing on the drill before heading out to the church camp.

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# The Drill Begins

L.O.H. Engine 3651 and Tender 3661 arrive on the scene and the drill begins.

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# Dump Site Set-up

Engine 3651 carries a 2,100-gallon dump tank and crews go to work setting up that tank in preparation for moving to a dump site operation.

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# Dump Site Set-up

Tender 3661 prepares for nurse tanker operations using its 750 gpm pump to supply the attack pumper (E3651) until the dump site can be made operational.

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# Dump Site Set-up

Pomona Engine 3952 (1,000 gpm) is the second pumper to arrive on the scene and goes to work setting up as the “dump site” pumper.

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# Nurse Tanker Operations

The key to the success of this drill was the ability of the first tender (T3661)to pump its water to the attack pumper (E3651) until such time that a dump site could be set up. At just over the 3-minute mark, Tender 3661 is connected and supplying water to E3651 through a single, 3-inch line.

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# Dump Site Set-up

A total of five persons operated two pumpers and a tender while at the same time set up the first dump tank – all within five minutes of arrival.

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# Water Flow Starts at 250 gpm

At the 5:00 minute mark, water flow is started at the attack pumper using the pre-piped deck gun. A hand-held pitot gauge was used to verify flow.

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# Dump Site Set-up

Pottawatomie Tender 3361 (3,000 gallons) arrives next around the 7:20-minute mark. With nurse tanker ops still underway, crews work to get a second dump tank down in preparation for a larger operation.

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# Dump Site Operations

Tender 3661 dumps some of its 4,000 gallons into the first dump tank while still pumping to the attack pumper. This water was used to allow the dump pumper to obtain a draft.

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# Dump Site Operations

One issue that occurred was a dump tank drain that was loosely tied up – on the outside of the tank. The drain had to be fixed before the operation could move forward.

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# Additional Units Arrive

Using the “Tanker Task Force” concept, the first task force of tankers arrives on the scene.

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# Dump Site Operations

Water transfer devices are in place and the second dump tank is placed into operation at 14:41 minutes.

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# Dump Site Operations

Wellsville Tender 3761 quickly dumps its 1,800 gallons of water as flow is moved to 500 gpm.

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# Improving Capacity


A length of 2-1/2-inch suction hose was added by the dump site pumper in order to increase pumping capacity to 1,250 gpm.

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# Water Flow Moved to 500 gpm

At the 15:00 minute mark, flow was moved to 500 gpm at the attack pumper where it was sustained for the remainder of the drill.

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# Dump Site Operations

A two-dump tank operation was now underway and all nurse tanker operations had stopped. The attack pumper (red) is being supplied by the dump site pumper (yellow) via dual, 3-inch supply lines.

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# Dump Site Operations

At around the 28-minute mark, the third dump tank was ready to be placed into operation.

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# Dump Site Operations

Because almost every tanker dumped off of the rear only, the three dump tanks were placed in a “diamond” configuration – thus creating a loading dock effect.

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# Dump Site Operations

At the 45-minute mark, three dump tanks were full of water and tankers were waiting to dump.

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# Water Transfer Operations


Water transfer operations were handled by the dump site pumper and by the Cutler grass rig. A total of three jet siphons were used to transfer water.

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# Water Transfer Operations


The Cutler grass rig (400 gpm) drafted from Tank 2 and powered a jet siphon (orange supply feed) to transfer water from Tank 3 into Tank 2. Note: the second suction line in the red tank was not in use at the time of the photo. Crews were waiting on a jet siphon device.

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# A Critical Point

Near the 48-minute mark, dump site operations were dangerously low on water. A supply line had broken at the fill site and that had slowed the return of tankers. However, tankers did make it back just in the nick of time and flow was never lost.

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# Dump Site Operations

L.O.H. Tender 3662 arrives just in time with its 3,200 gallons of water! The rig is seen to the left – backing up to the dump tank.

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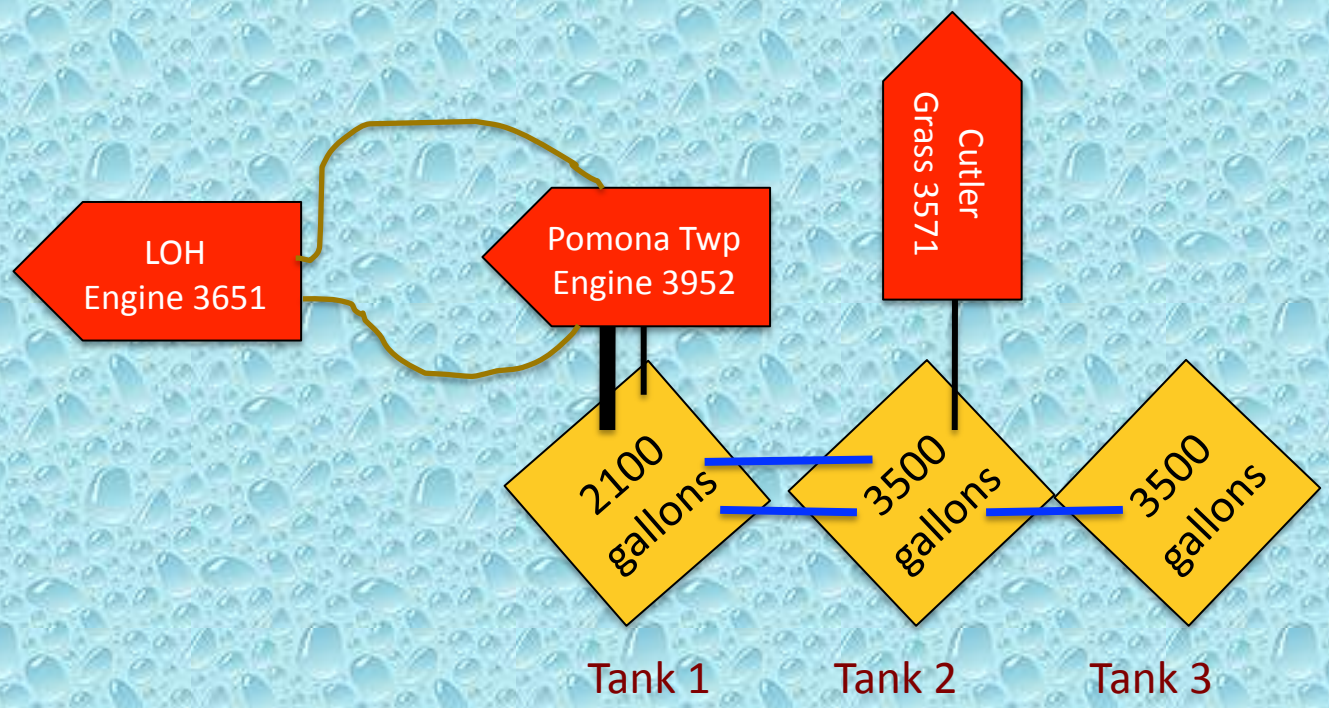
# Dump Site Layout

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# The Fill Sites

- For this drill – two fill stations were used, both at the same pond.
- The pond was located at a church camp located on Eisenhower Road and provided about a 6.0-mile roundtrip for the units hauling water.
- One of the fill stations used a grass rig and pumper combination in an "open-relay" set-up.
- The other fill station used a pumper (Engine 3652 [1,500 gpm]) supplying 5-inch LDH to a loading valve.
- The pond provided ample water volume to support the drill and access was not a problem.

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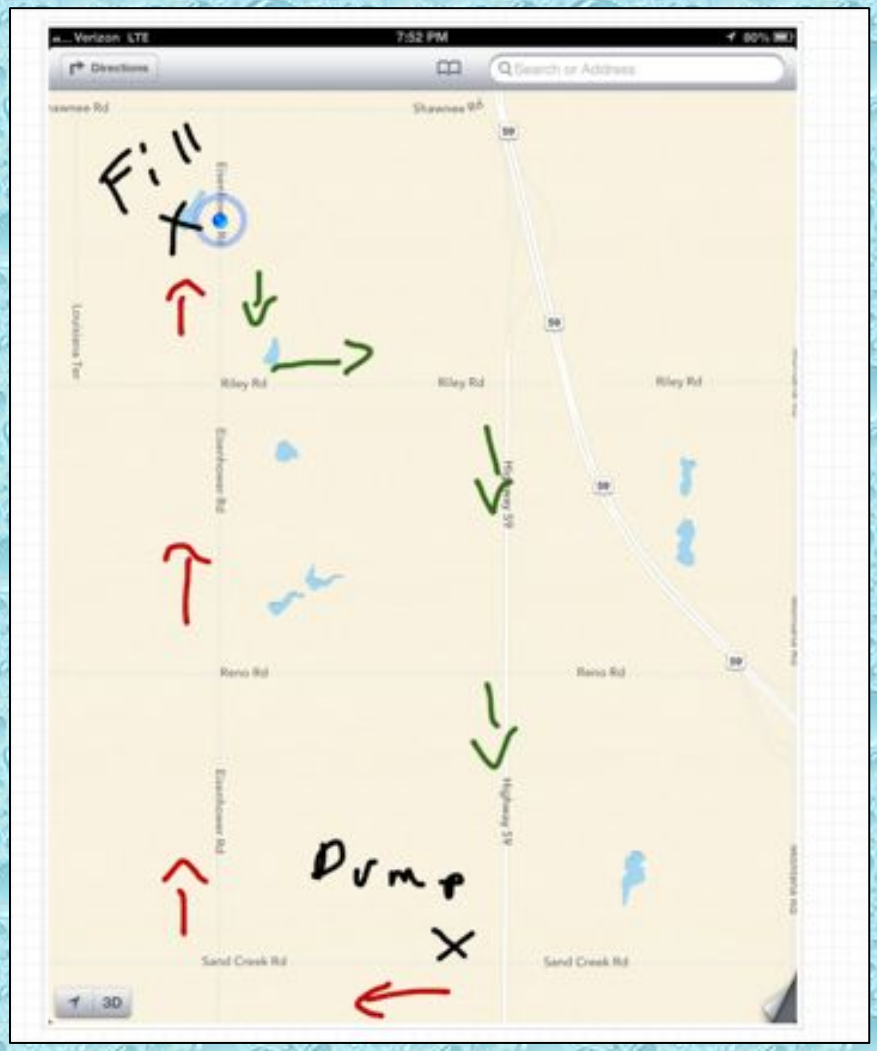
# The Travel Route




The travel route was simple, but took tankers over narrow gravel roads common to Franklin County. Thus, travel time was very much representative of real life response times.

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# Fill Site Operations

All loading operations took place in the main parking lot at the church camp. Two independent fill site pumpers supported two loading stations in the same parking lot. Note the 5-inch LDH supply line on the right that supported one of the loading stations.

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# Fill Site Operations

At the first loading station, Pomona's grass rig (400 gpm) drafted from the pond and pumped water to a portable dump tank. (Engine 3652 is seen in the background drafting and supplying the 2nd loading station via 5-inch LDH).

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# Fill Site Operations

Centropolis Engine 3851 (1,000 gpm) then drafted out of the dump and filled tankers using dual, 3-inch hose lines.

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# Fill Site Operations


One of the problems early on was that the pumper did not have any 6-inch suction hose – so dual, 2-1/2-inch suctions had to be used.

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# Fill Site Operations

Eventually, 6-inch suction hose was located on one of the rigs and the pumper increased its ability to load tankers. The "open relay" was used to meet the 1,000 gpm fill rate while using a limited supply source (400 gpm grass rig).

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# Fill Site Operations

Engine 3652 (1,500 gpm) drafted from the dam and supplied water back to a loading station via 400 ft of 5-inch LDH. This loading station easily met the 1,000 gpm fill rate goal.

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# The Results

- The drill was stopped at the 90-minute mark due to an air travel scheduling issue with the instructors.
- Water flow was **never** interrupted during the drill.
- A 250 gpm flow was started at the 5-minute mark and was increased to 500 gpm at the 15-minute mark with **no problems**.

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# The Results

- An estimated 40,000 gallons of water were flowed through the attack pumper during the drill producing an average flow rate of 471 gpm – but really 500 gpm from the 15-minute mark until the end.
- There had been some initial skepticism that a 500 gpm flow could be sustained – that was clearly proven wrong.

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# The Lessons Learned

- At the Ottawa drill, there were only about 19 people actively involved in the water supply delivery process.
- The following is a breakdown of personnel and assignment:

| Unit | # of People | Assignment |
|---|---|---|
| Engine 3651 | 2 | Driver/pump operator for attack pumper operations |
| Engine 3652 | 3 | Driver/pump operator plus crew for fill site operations |
| Engine 3851 | 3 | Driver/pump operator plus crew for fill site operations |
| Engine 3952 | 1 | Driver/pump operator for dump site operations |
| Grass 3571 | 1 | Driver/operator for jet siphon support |
| Grass 3972 | 1 | Driver/operator for fill site support (draft) |
| Tender 3661 | 1 | Driver only |
| Tender 3662 | 1 | Driver only |
| Engine 3653 | 1 | Driver only (hauled water) |
| Tender 3361 | 1 | Driver only |
| Tender 3861 | 1 | Driver only |
| Tender 3961 | 1 | Driver only |
| Tender 3761 | 1 | Driver only |
| WSO | 1 | Water Supply Officer |

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# The Lessons Learned

- Using the "gpm per person concept", 19 persons supported an average flow of 471 gpm over the duration of the drill. Therefore, the gpm per person result was 24.8 gpm per person.
- During the time period where the drill produced a 500 gpm sustained flow rate, each of the 19 persons contributed 26.3 gpm.
- In both cases, the results show that the higher the gpm per person rate, the more efficient the water supply operation.
- While the "gpm per person" concept is not a complete indicator of effectiveness, it is a good tool for understanding the number of personnel needed to support an extended water supply operation and the efficiency of such operation.

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# The Lessons Learned

- The use of Tender 3661 as a nurse tanker during the early minutes of the drill provided valuable time to the dump site crew. There was no need to rush around and hastily set-up dump tanks. There was ample time to think through the process and not run out of water.
- Even though a smaller capacity pumper was used as the dump site pumper, the use of the 2-1/2-inch suction hose and the grass rig to run a jet siphon made a big impact on the total capacity ability.

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# The Lessons Learned

- A tanker fill-site needs to run like a NASCAR pit stop. Anything that slows down the loading of tankers is going to reduce the efficiency of the tanker shuttle.
- The use of LDH is almost certain to improve tanker loading times. The loading goal is 1,000 gpm.
- To be most effective using LDH, manifolds and a variety of appliances and adaptors are needed.

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# The Lessons Learned

- The flow capability of low level strainers varies from manufacturer to manufacturer. It is in a FD's best interest to drill with their strainers to learn what maximum flows can be obtained.
- Jet siphons, suction hose, and dump tanks are needed at most every dump tank operation – therefore, it is wise to carry those items on every tanker.

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# The Lessons Learned

- A “best practice” is for tankers/tenders to be marked on all sides with unit identification. At large-scale, mutual aid incidents, tanker/tender identification is important to the Water Supply Officer.


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# Summary

- The drill was a success. For the new folks, they got to see how dump tank operations work.
- For the older, experienced folks, it was a chance to practice their "craft."
- The success of the drill showed the importance of mutual aid response practices and procedures – and the importance of mutual aid interoperability.
- Many thanks to the L.O.H Fire Department and the Franklin County Firefighter's Association for for sponsoring and hosting this seminar.

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