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PUBLIC WATER SUPPLY AND DISTRIBUTION AT THE FEMP

BY

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POTABLE WATER SUPPLY AND DISTRIBUTION AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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ABSTRACT

On February 17th, 1996, The Fernald Environmental Management Project (FEMP), A former Department of Energy uranium processing facility near the rural town of Fernald, Ohio, became a "user" instead of a "producer" of potable water by tying into the Cincinnati Water Works new Public Water Supply System. This satisfied the future site needs of potable water and nullified the need to follow the sampling requirements set forth by the Environmental Protection Agency and the Safe Drinking Water Act for potable water producers. This transformation into a customer also reduced the long water transmission time from the Cincinnati Water Works station to the small community that would have occurred without a large user such as the FEMP being on line.

BACKGROUND

Construction began on the Feed Materials Processing Center (FMPC), located 17 miles northwest of Cincinnati in Fernald, Ohio in 1951. The facility became fully operational in 1953 to produce highly purified uranium metal in support of defense activities. This included uranium derbies, ingots, billets, fuel cores, and target elements for DOE sites in Rocky Flats, Colorado; Savannah River, South Carolina; Oak Ridge, Tennessee; and Hanford, Washington.

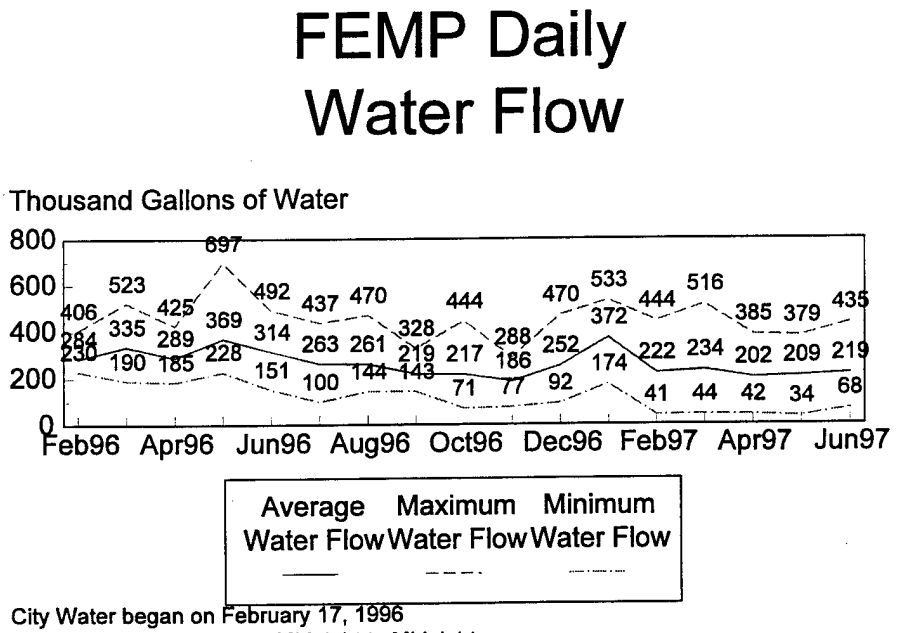
National Lead of Ohio (NLO) operated the FMPC from 1951 to 1985 under a contract with the Department of Energy (DOE) and its predecessor agencies. Westinghouse Materials Company of Ohio (WMCO) took over operation of the facility in 1986 until 1992. Production at the FMPC ceased in 1989 and officially ended in 1991. The FMPC was renamed the Fernald Environmental Management Project (FEMP) in August of 1991 to reflect its new mission of environmental restoration.

The Fernald Environmental Restoration Management Company (FERMCO), a subsidiary of Fluor Daniel, Inc., assumed the responsibility of the cleanup in December of 1992. FERMCO was renamed Fluor Daniel Fernald (FDF) in 1996.

PUBLIC WATER SUPPLY PROJECT

Sampling of 33 private wells indicated that the uranium levels above background were present in the ground water outside of the FEMP property boundary (SITE 1996). The Hamilton County Department of Public Water Works (HCDPW) proposed to implement a Public Water Supply (PWS) system that was an alternative water source for the approximately 300 property owners near the FEMP that were affected by, or had the potential to be affected by, uranium contaminated ground water generated by past operations at the FEMP (NEPA 1993). The Public Water Supply System would provide a safe, reliable source of potable water to these affected residents. The Department of Energy (DOE) partially funded this Public Water Supply project.

The Hamilton County Department of Public Water Works determined that with the small population of the Fernald area, transmission times would be extraordinarily long. The HCDPW asked the FEMP to become a user of this proposed public water system (NEPA 1993). A large user of water would significantly reduce the lag in transmission time. As one can see from the following graph, the FEMP is large user of water . The average daily usage ranges between 202 and 372 thousand gallons of water.



The FEMP included its own water treatment plant to provide potable water to the site and its employees. With the site being a producer of water, it was regulated by the Safe Drinking Water Act (SDWA). Potable water was produced by obtaining well water from three 135'(feet) deep wells. This well water was treated with cold lime and the addition of alum. A byproduct was formed from this treatment method which was deposited into a lime sludge pond. By 1991, it was required to take a revised course of action since the pond's remaining capacity was minimal. A non-sludge water treatment system known as the Electrodialysis Reversal System (EDR) was purchased. However , there were concerns as to whether or not this system could handle the FEMP future water demands (NEPA 1993). In 1993, a water needs assessment was conducted by the FERMCO Engineering Department to evaluate the alternatives for supplying the future potable water needs for the FEMP (Water 1993). The following summarized options were considered during this assessment:

- Continued utilization of the existing lime-alum softening operation for FEMP water usage

- Implementation of the non-sludge producing electrodialysis reversal system

- Meet potable water demands by becoming a public water supply customer of the HCDPW's PWS

The assessment concluded that becoming a public water supply customer was the most viable option.

As a result of this assessment evaluation and conclusion , It was decided by FERMCO and the Department of Energy that a tie-in to the Public Water Supply Project would be the best alternative. This would alleviate many problems including the diminishing capacity of the lime storage pond, and the transmission lag time faced by the HCDPW if a large user didn't tie into the PWS.

The FEMP became a user of potable water instead of a producer when the drinking water distribution system was connected to the City of Cincinnati Water Works on February 17th, 1996.

RESULTS OF TRANSITION OF "PRODUCER TO USER"

The table below shows the tests that were completed on a routine basis when the FEMP was a producer of potable water:

Test Performed	EPA/SDWA Regulations Drinking Water Testing Frequency
Fecal Coliform	Monthly
Lead	Quarterly
Copper	Quarterly
Chlorine Residual	Daily
pH	Daily
Uranium	Monthly
Alkalinity	Daily
Hardness	Daily
Hydrocarbons	Quarterly

As a result of the FEMP becoming a "user" of potable water instead of a "producer", all of the parameters that the water was tested for are not required, except for Fecal Coliform which is tested for on an as needed basis.

Even though the FEMP is not required to perform these tests by the EPA/Safe Drinking Water Act, the facility still tests for the following to assure water quality from Cincinnati Water Works, the owner and operator of the Public Water Supply System.

Test Performed	EPA/SDWA Regulations Drinking Water Testing Frequency
Fecal Coliform	As Needed
Lead	None
Copper	None
Chlorine Residual	Daily
pH	Daily
Uranium	None
Alkalinity	Daily
Hardness	Daily
Hydrocarbons	None

These samples are taken by state licensed personnel. The water distribution system at the FEMP also contains backflow preventers which obstructs unwanted material from entering the system.

When the FEMP did produce its own potable water, it was comparable in quality as what is received by the Cincinnati Water Works. The table below gives a comparison of the Cincinnati Water Works to the FEMP's water on a random day of production (Oct. 3, 1995):

Water Source	Total Hardness (Mg/L $CaCO_3$)	pH Standard Units	Chlorine Residual mg/L
Cincinnati Water Works	Average of 170 mg/L	9.0	0.4
FEMP Water Plant (October 3, 1995)	Average 106 mg/L	9.48	0.5

CONCLUSION

In addition to providing property owners surrounding the FEMP with a reliable source of potable water, the Public Water Supply Project enabled the FEMP to become a user instead of a producer of potable water. This reduced sampling requirements that were mandated by the Safe Drinking Water Act for producers of potable water. The site still samples for pH, alkalinity, and hardness to assure the highest water quality for site personnel. These samples are taken by state licensed personnel. Since the FEMP is such a large user of potable water, the public water supply tie in also reduced the slow transmission time that would have occurred with such a small number of customers.

References

National Environmental Policy Act (NEPA) Categorical Exclusion Determination, FEMP Public Water Supply Tap-in, NEPA Document No. 433, October, 1993.

Removal Site Evaluation Public Water Supply Tap-In Phase, May, 1994
Site Restoration Services Department, "1995 Site Environmental Report", June, 1996

Strategic Plan for the FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, September, 1995

Water Needs Assessment for the FEMP, CRU5 Engineering, April, 1993

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