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Rose Galbraith,
MPH



Nicholas Sharp,
MPH



Deyonne
Sandoval, MS,
CHES

Collaborative Response to Natural Disaster Events Threatening Private Well Water Quality in a New Mexico Community

New Mexico Department of Health

Editor’s Note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC’s Water, Food, and Environmental Health Services Branch, as well as guest authors, will share insights and information about environmental health programs, trends, issues, and resources. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

Rose Galbraith has been with the New Mexico Department of Health (NMDOH) Epidemiology and Response Division (ERD) for 4 years with 2 years in the Environmental Health Epidemiology Bureau as the private wells epidemiologist. Nicholas Sharp is a program evaluator in the NMDOH-ERD Environmental Health Epidemiology Bureau. Deyonne Sandoval is the coordinator and evaluator for the New Mexico Environmental Public Health Tracking program and the communications specialist for the Private Wells Program in the NMDOH-ERD Environmental Health Epidemiology Bureau.

An estimated 400,000 New Mexicans rely on drinking water from private wells, particularly in rural areas. Private well water quality is unregulated in the state; therefore, public health plays an essential role in helping to mitigate health risks associated with contaminated private well drinking water through education, outreach, and response.

One essential function of the New Mexico Department of Health (NMDOH) Epidemiology and Response Division’s (ERD) Private

Wells Program, under the Centers for Disease Control and Prevention’s Safe Water for Community Health (Safe WATCH) program, is well owner outreach and linking well owners/users to testing and educational resources. This function is especially important before, during, and after natural disaster events that could impact private well water quality. Providing resources to well users occurs through program and community partnerships. This column will illustrate how the Private Wells Program proactively used both established

and new program partnerships to reduce public health risk during a community’s environmental events.

Disaster Response Case Study

The public health concerns in the village of Ute Park, a mountainous community in northern New Mexico, began May 31, 2018, with the Ute Park Wildfire burning as near as 1 mile from the village (Figure 1). The fire, contained on June 17, 2018, burned over 36,000 acres and left the ground charred and unable to absorb water, creating ideal conditions for flash flooding. By mid-June 2018, flash flooding, an expressed concern of residents, was expected and the large burn scar in the Ute Park area was considered especially vulnerable.

Collaborative Response

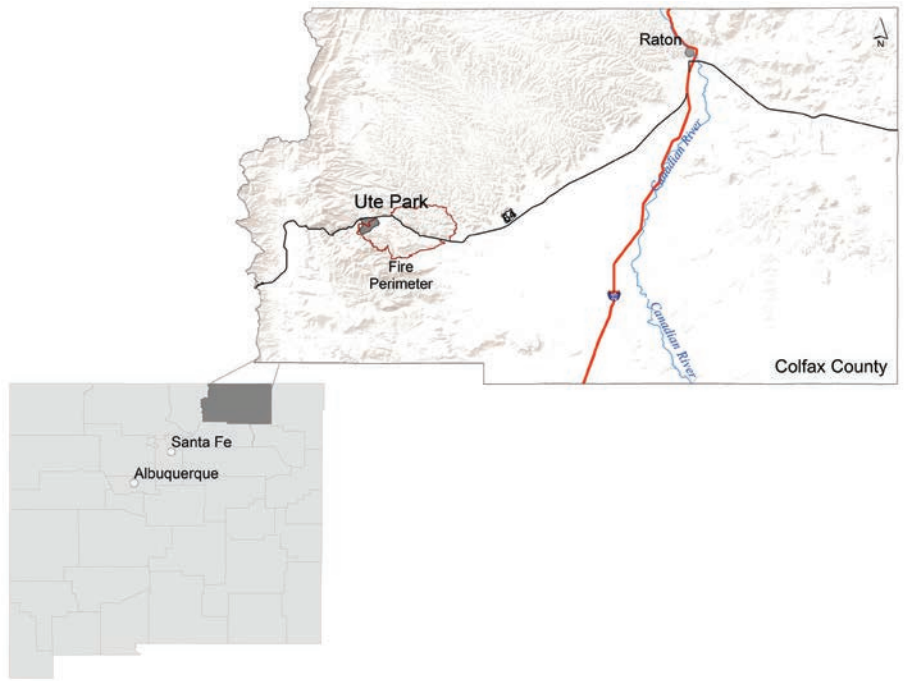
The NMDOH-ERD Environmental Health Epidemiology Bureau’s response, coordinated by the Private Wells Program, included compiling information packets. The information packet content included

- how to protect a well before, during, and after a flood;
- disinfection guidelines;
- well contractor hiring guidelines;
- a certified laboratory list; and
- information on reducing exposure to mold.

As the New Mexico Office of the State Engineer and Ute Park fire chief communicated together, they learned that an estimated 50 full-time Ute Park residents (with an additional 150 vacation/seasonal properties) had a private drinking water well. The Private Wells Program worked with the New Mexico

FIGURE 1

Location of Colfax County and Ute Park, New Mexico

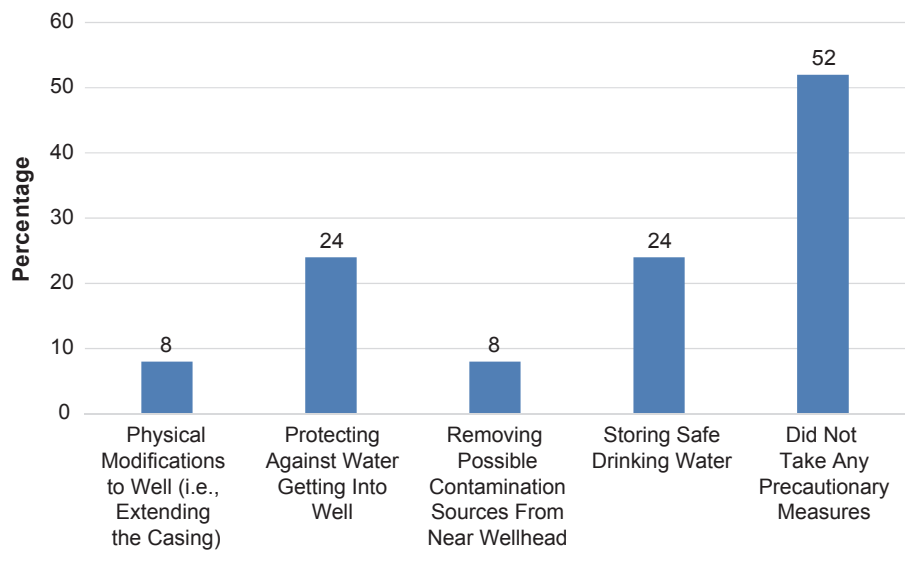


bacteria after a flood is a common public health recommendation. The Private Wells Program and the New Mexico Environment Department, in coordination with the fire chief, worked to provide the community a free well water testing fair for area well users approximately 10 days after flooding occurred. These water testing fairs routinely offer free tests for pH, conductivity, fluoride, iron, sulfate, nitrate, and arsenic. The Private Wells Program, with New Mexico Environment Department partners and technical assistance from the NMDOH-ERD Environmental Health Epidemiology Bureau, also offered free testing for coliforms and *E. coli*. The Private Wells Program, in partnership with the New Mexico Environmental Public Health Tracking program, developed digital and print educational materials specific to waterborne disease and private wells.

This event allowed the agency's private wells epidemiologist to deliver on-site education and supplementary educational material to the 35 residents who attended the event. In cases where the water tests had concerning results, NMDOH followed up with the residents.

FIGURE 2

Precautionary Measures Taken by Well Owners (n = 25)



Evaluation and Next Steps

Anecdotal information from community members suggested well owners, in response to the information packets, were following public health recommendations and some had made physical modifications to their wells prior to flooding. To confirm these impressions and evaluate the overall response effort, the Private Wells Program issued a survey to area property owners. To ensure relevance of the survey, a content validity index was computed based on feedback from four experts.

Survey respondents (n = 25) received the survey via e-mail through the homeowners association in Ute Park. Of these respondents, only 28% (n = 7) received or saw a resource packet from NMDOH. Questions used a 5-point Likert scale to assess the packet's influence on precautionary measures taken with the well. The scale ranged from 1 (strongly disagree) to 5 (strongly agree), with 3 representing a neutral answer.

Of those that received or saw a packet, the average answer was 3.66, an average neutral-agree response that shows a slightly above neutral effect of the well packet on well owners taking precautionary measures. Residents were asked about the precautionary measures

Office of the State Engineer to obtain contact information for known area well owners. Packets were mailed to about 40 owners of permitted drinking water wells.

The local fire chief received a concern about septic overflow during a flood event. Area wells are shallow with a high prevalence of septic systems and testing well water for

used to protect their wells. Approximately half of the respondents took no precautionary measures, with 24% ($n = 6$) of well owners protecting against water getting into the well and storing safe drinking water. Only 8% ($n = 2$) of well owners made physical modifications to the well and removed possible contamination sources from near the well-head (Figure 2).

Of the participants that had their well water tested after flooding ($n = 6$), 67% ($n = 4$) were influenced to test their water because they learned about water quality and well testing from the packet and 83% ($n = 5$) were influenced to test because of the water testing fair offered nearby.

Based on evaluation results, distribution networks need to be improved to reach well owners to maximize the effect of outreach efforts. While the packet did not have a large effect on a well owner's decision to take precautionary measures, the packet and availability of a water testing event did influence well testing behavior in a large percentage of participants.

Challenges

Finding and reaching well owners in a timely manner during disaster responses in New Mexico is a challenge. Finding current well owner and well location information in an easy-to-use format can also be challenging and time consuming. Although the Private

Wells Program is developing a comprehensive database, the effort is ongoing and gaps exist. The need for such a database is highlighted during response events. Such challenges are mitigated through communication with agency and community partners. Utilizing existing program partnerships and cultivating a community relationship before and after flooding occurred were essential to this response effort. 🐛

Corresponding Author: Rose Galbraith, Private Wells Epidemiologist, New Mexico Department of Health, 1190 Saint Francis Drive, Suite N1300, Santa Fe, NM 87505.
E-mail: rose.galbraith@state.nm.us.

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