



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15TH STREET, SUITE 3200
HELENA, MONTANA 59626

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

FEB 18 2010

Leroy Spang, President
Northern Cheyenne Tribal Council
P.O. Box 128
Lame Deer, MT 59043

RE: Emergency Administrative Order
Notice of Violation and Addendum
Docket No. SDWA-08-2010-0013
Birney Water System, 083090062
Muddy Cluster Water System,
083090065

Dear President Spang:

Thank you for the time you set aside this morning to speak with EPA about the status of drinking water service for Birney and Muddy Cluster. The purpose of this letter is to formally notify you that the Tribe and Northern Cheyenne Utilities Commission (NCUC) are in violation of the Emergency Administrative Order (Order), issued by EPA on January 14, 2010.

Violations

1. Weekly total coliform sampling per paragraph 20 of the EAO is required until EPA notifies you in writing otherwise. No sample was collected in either community for the week of February 1, in violation of this requirement.

The samples must be collected at representative points within the distribution system. One of the weekly samples collected in Birney during February may be designated as the system's monthly compliance sample. The weekly samples for Muddy Cluster may be designated for compliance as part of the five additional routine samples that are required during February for that system. Five routine samples are required for Muddy Cluster in February, 2010 due to the coliform positive sample collected on January 19.

2. Paragraph 18 of the EAO requires that the chlorine residual be measured and recorded on the lab slip at the same time the coliform samples are collected. On January 25, Winslow Whitecrane, NCUC, was notified by phone that the chlorine residuals needed to be kept at a minimum of 0.5 mg/L at the end of the Birney and Muddy Cluster systems until notified otherwise by EPA. The requirement to maintain a minimum chlorine residual of 0.5 mg/L is also found in the addendum to the EAO sent to your office and NCUC on February 5, 2010. At this



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time we have been verbally notified by NCUC that the chlorine pump in Birney is working, but there is a risk that chlorine levels will be high until the chlorine pump is repaired so that it pumps only when the well pump is running.

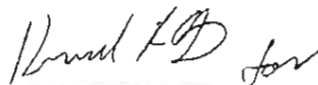
3. Paragraph 24 of the EAO requires that, within 7 days of issuance of the EAO, the Utilities Commission shall "report in writing to EPA the known or suspected cause of the loss of pressure events and what measures will be taken to prevent a reoccurrence of these problems." David Shultz, an Engineer under contract with EPA, inspected both water systems on January 13-15 and identified a number of problems (copy of report attached). Winslow Whitecrane of the NCUC has also spoken with the local electrical provider and a pump company about necessary repairs. Mr. Whitecrane provided a brief assessment of the problems in a January 19 letter to EPA. EPA asked for clarification and additional information in a January 25 email. On February 4, EPA provided a list which identified all the items which needed to be included in the response. On February 9 that list was returned, with a very minimal and inadequate response. On February 16, EPA reviewed the list with Mr. Whitecrane and is awaiting a final version. At this time, EPA remains concerned about repair work which is urgently needed in order to ensure continued reliable water service for these communities, particularly Birney. The failure to provide an adequate response constitutes a violation of this requirement of the Order.

Addendum

The boil order for Muddy Cluster may be lifted at this time. The boil order for Birney must remain in effect. Customers in Birney should be notified a minimum of once per week of the recommendation to boil their water, using the public notice already prepared in January as a requirement of the Emergency Order.

Should you have any questions about these or other requirements of the EAO, you may contact Barbara Burkland in the EPA Montana Office, who can be reached at (406) 457-5009, or your attorney may contact Amy Swanson, Enforcement Attorney, who can be reached at (303) 312-6906. Again, it is very important that the Tribe and NCUC comply with all requirements of the Emergency Order in order to avoid escalation of this matter to the U.S. Department of Justice.

Sincerely,



Julie DalSoglio, Director
EPA Region 8 Montana Office



David Rochlin, Supervisory Attorney
Legal Enforcement Program
Office of Enforcement, Compliance, and
Environmental Justice

cc: Winslow Whitecrane, Manager, NCUC
Heather LaTray, IHS
Tina Artemis, EPA Region 8 Hearing Clerk

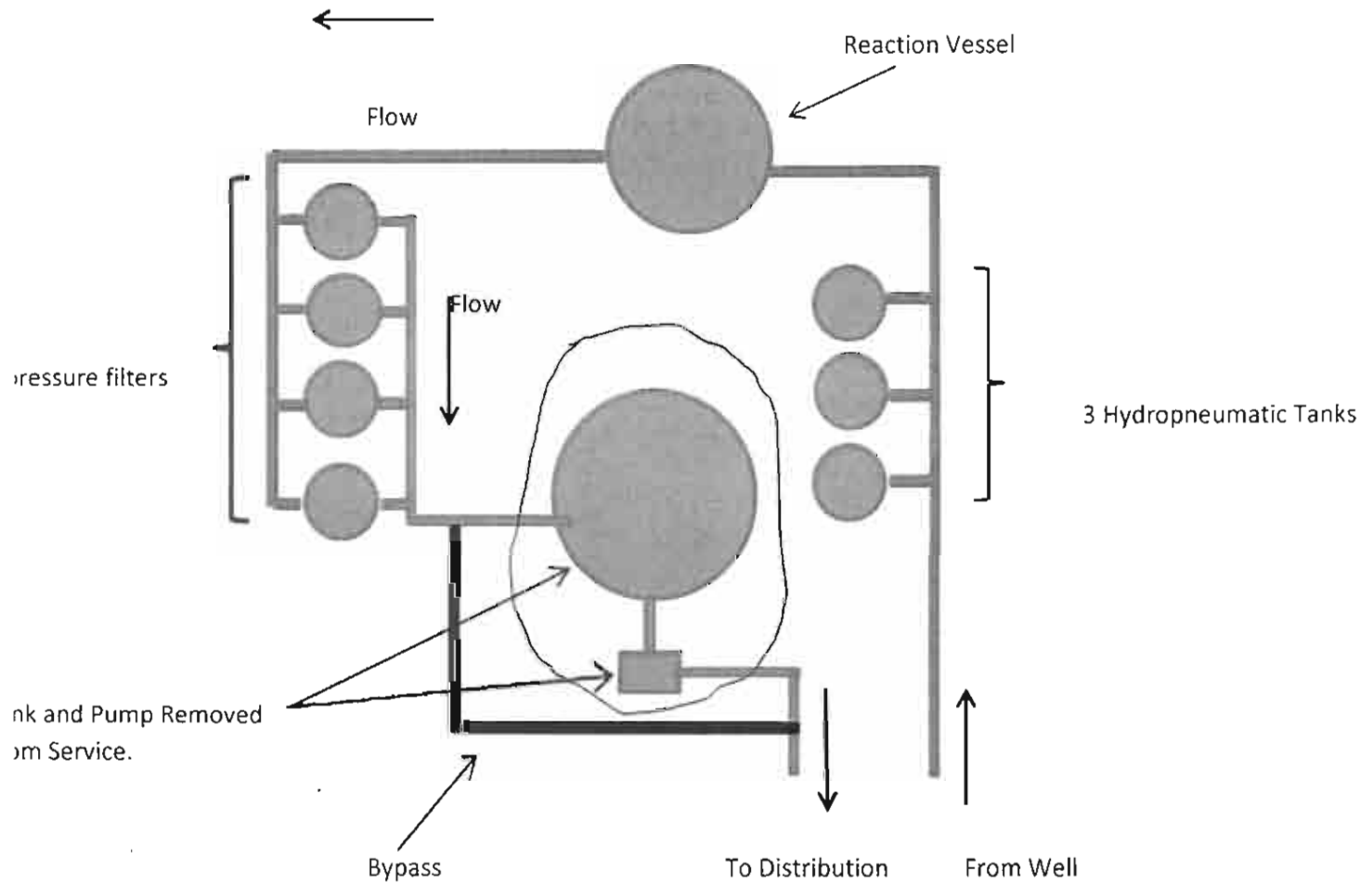
Well Pump Failures

The utility staff reported that they had lost the well pumps at Birney and Muddy Cluster on January 9, 2010. They were unsure what had caused both pumps to fail on the same evening.

Subsequent investigation revealed that the Birney pump likely failed as a result of adverse running conditions. An unknown flow restriction in the Birney system causes the 5-1/2 Hp pump to run for only 30 seconds before high pressure forces a shutdown. The pump is then idle for about 2-1/2 minutes before it cycles on again for 30 seconds. The pump was installed new in August of 2009 and failed after 5 months of service under these run conditions. Please see below for further discussion of the flow restriction within the Birney system.

The utility staff reported that the Muddy Cluster pump was old and likely had reached the end of its service life. No adverse run conditions were discovered at Muddy Cluster.

Birney Treatment Plant Schematic



Birney Treatment Plant Problems

The flow control for the treatment system was designed as follows. The well pump pushed the water through the treatment process and the hydropneumatic tanks provided pressurized storage. The well would start, and once a pressure of about 60 psi was obtained the well kicked off. Water would then flow from the hydro tanks through the treatment process until the pressure declined to about 40 psi at which point the well kicked on again. The treated water was discharged into a gravity storage tank located within the plant.

A booster pump took suction from the gravity storage tank and discharged to distribution. Gravity tanks on a nearby hillside provide elevated storage for the community. A Mercoid switch on the booster pump discharge pipe sensed the pressure within the distribution system and provided on/off control for the booster pump.

Since initial construction the flow scheme has been altered. The storage tank and the booster pump were removed. A bypass was installed that allowed the well pump to discharge water through the treatment process and into the distribution system. On the above schematic I have circled the items that were removed from service and I have shown the bypass piping in black.

This alteration of the flow scheme has had several undesirable effects:

- 1) A flow restriction results in a rapid pressure build-up once the well turns on. This causes the well to turn off after 30 seconds of run time and to restart approximately 2-1/2 minutes later. This frequent cycling caused the previous well pump to fail after 5 months of service. The cause of this flow restriction is presently unknown and is discussed in further detail later in this report.
- 2) The flow restriction has reduced production through the plant to 6 gallons per minute. This production rate is insufficient to supply the demand from the community.
- 3) The elimination of the booster pump and the Mercoid switch has resulted in no level control for the elevated storage tanks. Recently installed telemetry, which was intended to supply this level control, is inoperable and the operators report that it has not functioned since installation.
- 4) The chemical metering pump for the sodium hypochlorite disinfection system operates continually, even when the well shuts down. This results in over-feeding of chlorine. This overdosing is not acute under the present flow conditions where the well runs for 30 seconds every three minutes, but once the plant is operating correctly severe overfeeding of chlorine will occur.
- 5) Higher operating pressures. Under the original control scheme the pressures within the plant treatment system ranged from ~40-60 psi. Under the new scheme the

pressures normally range from ~65-80 psi. The higher pressures are needed to pump the treated water into the distribution system. When I first arrived at the plant the operating pressure was ~90 psi as the motor starter was malfunctioning and the pressure switch was not able to shut down the well pump. We checked the hydropneumatic tanks and found that two of them were still functional, but the third tank had a ruptured bladder and was no longer functional. Additionally, the pressure blow off on the reaction vessel was blowing water onto the ceiling and the wall of the plant.

Birney Pressure Restriction Problem

The Birney plant discharges to the distribution system and two gravity tanks, connected in parallel, provide storage. A 6 inch diameter main exits the plant and connects to the distribution piping. Similarly, a 6' diameter main connects the community to the elevated storage. The distribution system pressure, as a result of these elevated tanks should be about 45 psi. The pressure gauge on the plant discharge piping does not reflect this pressure however. The gauge reads from a low of 65 psi up to a high of 85 psi. These pressures are dictated by the pressure switch, located in the plant, which provides well on/off control.

A pressure restriction is inhibiting the discharge of treated water from the plant. This restriction is causing the rapid pressure build-up that causes the well pump to cycle frequently and also results in the flowrate through the plant to be reduced to 6 gallon per minute.

We attempted to locate and rectify this pressure restriction. We checked all valves within the plant and did not locate an improperly closed valve there. We placed a valve key on the buried valves located adjacent to the plant and verified that they were fully open. We placed a valve key on the buried valves at the elevated storage tank and verified that they were fully open.

Our ability to locate valves within the distribution system was hampered by the lack of a distribution system map. We searched the Utility offices to no avail and we also met with the Tribal Housing Department without success. The Indian Health Services engineer was unavailable.

Once a map of the system is obtained, a pressure survey of the community should help to identify the area where the restriction is occurring. Once the general area is identified, all valves within the area should be checked to make certain they are fully open.

Well Static and Pumping Levels

H&H Drilling placed new pumps in the Birney and Muddy Cluster wells after the pump failures of January 9. No pump curves were available for the new pumps. To make certain that the well pumps would not pump the wells dry, which could result in pump motor failure, the static and pumping levels were measured.

Mike Haggerty of H&H Drilling told me by telephone that the new Birney pump was set at 70' below casing top. He likewise told me the Muddy Cluster pump was placed at 40' below casing top.

At Birney, we measured a static water level 18.5' and a pumping level of 21.25'. This pumping level was stable after about 15 minutes of runtime.

At Muddy Cluster, we measured a stabilized pumping water level of 29.5' and a static level of 27'.

The new pumps are not over pumping the aquifers.

Summary

Imminent Threats-

- 1) The pressure restriction at Birney needs to be located and repaired. At present the restriction is causing treated water flow rates to be reduced to 6 gallons per minute. This rate is not sufficient to satisfy demand and further pressure losses could be experienced in the community, along with the attendant cross connection hazards.
- 2) The pressure restriction is also causing the 5-1/2 Hp pump to cycle on for 30 seconds in every 3 minute interval. This frequent on/off activity resulted in the previous motor failing after 5 months of service and will likely cause premature failure of the new motor as well. Such failure will result in no water for the community along with the attendant pressure loss and cross connection hazards.
- 3) The chemical metering pump for the sodium hypochlorite disinfection system must be configured such that it shuts down when the well pump shuts down. Presently it runs continually and this will result in severe overfeeding, especially once the pressure restriction problem is rectified.
- 4) Training is urgently needed in the operation of the iron removal plants. The Northern Cheyenne utility staff does not have a working knowledge of the systems and their various components. Additionally, operation and maintenance manuals are missing for most of the equipment within the plants. Public health could be jeopardized by the improper operation and maintenance of these facilities.

Recommendations

5) The storage tank and booster pump should be placed back into service at the Birney plant. This will result in a better control scheme for the plant and lower operating pressures.

6) The tank level radio telemetry at Birney should be made operable. This is a new system that was installed in September of 2009. The Indian Health Service should have their vendor affect the needed repairs before the one-year warranty period expires. If the telemetry cannot be made to function correctly and reliably, the Mercoid switch control should be placed back into service.

7) Updated distribution system maps need to be located or created for the Birney system. The lack of these maps makes the understanding and operation of the distribution system very difficult.

8) The Northern Cheyenne utility staff needs to acquire a new electric tape measure, their existing electric tape is broken. This device is needed to measure well levels and also to measure tank levels. The Birney and Muddy Cluster tanks are buried fiberglass tanks. The operators cannot readily open the hatches to visually check these tank levels. To access the interior of the tanks requires unbolting a large and difficult to maneuver hatch. To measure the tank levels quickly, the electric tape can be dropped down the vent pipe. This is the only method to know the water levels in the tanks in the absence of operable telemetry.