

## REPORT OF SANITARY SEWER OVERFLOW

Report completed on 3/17/09

(26 total pages)

Incident occurred: 3/1/09.

03/01/2009 Location: Forcemain (ditchline) in front of 6237 N. 37<sup>th</sup> Street:

Time discovered: Sunday, March 1, 2009; 12:30 pm; Temperature 22 degrees

Discovery: Employee Bowman, Field Supervisor, noticed ponding along the ditch while driving in front of address 6237 N. 37<sup>th</sup> Street on Sunday, March 1<sup>st</sup>, at approximately 12:30 pm. Our 12" forcemain lies along the west side of the road within the road right-of-way. This ditchline is typically under water at this location due to the high water table and therefore, ponding should not be visible in the winter, as nighttime temperatures had been well-below freezing for many days and the ditches at this location normally contain visible frozen water in the winter and standing water in the summer. Noticing the ponding, and knowing our forcemain is there, he stopped to check and observed wastewater seepage from the earth at the location of our pipeline.

(attch pg 1,2,3,4,5: location map + pictures depicting the leakage and ponding in the ditchline)

Review of discovery: Address 6237 is the closest residence, with the structure being 175 feet west of the discovered leak. Address 6237 is not connected to the sewer forcemain. Address 6254 across the street, 487 feet distance from the leak area, is connected to the public sewer forcemain via a grinder pump. Grinder pumps connect directly to the ductile iron forcemain (similar to a water tap) and Mr. Bowman suspected the leakage was at the location of the tap, as it is highly unlikely the 12" ductile iron forcemain would be leaking, and if it were, there would be significantly more wastewater seepage. The ductile iron forcemain was installed in 1982 and there have been no prior leakage instances with this pipeline.

(attch pg 6: picture depicting the closest address to the leak and ponding area)

Action steps: Mr. Bowman phones Authority Director Pierson who was attending a Public Works conference in Charlotte, NC; and also phoned Balkema Excavating to begin the repairs. Mr. Pierson, in a return call at 12:45 pm, advised him to phone Mr. Wheat, engineer, first thing Monday morning to review the well logs of the nearest homes and to calculate the amount of wastewater that may have leaked, in order to ascertain the level of concern, if any, with respect to the property owners in this regard. Mr. Pierson would do the follow-up contact with Mr. Wheat 1<sup>st</sup> thing Monday morning. Bowman and Pierson agreed that a

licensed septic hauler truck should be on-site as well to assist the excavation and to remove any standing wastewater. Mr. Bowman called Plummer's Septic Tank Service to the scene. Mr. Bowman also called in an emergency Miss Dig locate request for other utilities as required.

Additional observational detail: Mr. Bowman noted that the ponding had spread southward along the ditchline as noted on the attached map. He also observed wastewater sediment lying on the ice-mixed with snow. He noted the cross-tube to the pond area on the east side of the road (200 feet diameter-3/4 acre) was plugged, and no noticeable impact was evident on the east side of 37<sup>th</sup> Street.

(attach pg 7: picture depicts three pond areas, ponds in the forefront were impacted)

Temperatures: Daytime high temperature was 22 degrees, and nighttime temperatures were well below freezing the week prior (see attached temperature log). Daytime high temperatures Sunday, Monday and Tuesday, March 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup>, were also below freezing with stiff winds.

(attach p 8: temperature log month of February and 1<sup>st</sup> two weeks of March)

Repairs: After receiving permission from the County Road Commission for emergency hauling of equipment (frost laws) and waiting the required two hours for Miss Dig Emergency, Balkema Excavating excavated the leak area at 3:30 pm on Sunday afternoon and confirmed that the leak was in the 1 ¼ inch copper pipe where it was tapped into the 12" main, not in the 12" ductile iron forcemain. The tapping valve at the main was shut off at 5:30 pm and the leak was stopped. Subsequent repairs to the 1 ¼ inch service line were completed by Monday afternoon. The cross sectional area of the leak was determined to be 0.375 sq inches.

(attach p 9: picture depicts ½ inch split in copper service pipe where connected at the main)

Homeowner contact 6237 (west side of road closest to leakage area – home is not connected): Mr. Bowman spoke with Mrs. Greene at address 6237 on Sunday evening and advised her that the repairs would be made as promptly as possible. Mrs. Greene noted her husband had observed the leakage on Friday evening, phoned the Sherriff's office, who unfortunately advised him no one would attend to it until Monday. The Authority office never received a call from the County dispatcher although our emergency contact is on-file there. Mr. Bowman phoned the dispatch supervisor on Monday and was advised they would look into the gap in coverage / contact error. Our numbers are properly on file at the dispatch office and our after-hours phone system provides emergency contact, as does our web site, [www.glswa.org](http://www.glswa.org). A later phone conversation with Mr. Greene indicated that the leak may have been occurring several days prior to the Friday when he phoned the County.

Homeowner contact 6254 (east side of road - connected): At 5:30 pm, Mr. Bowman contacted Mr. Livingston at 6254 and advised him that their grinder pump service line (the service line that had been leaking) was shut off for the evening and would they please minimize their usage for 24 hours, as repairs to the service line were to be made on Monday morning. (Mr. Bowman advised them on Monday after repairs were completed that they were back-in-service.)

Review of well logs: The initial primary concern of this event is that there is no public water system in this area, and the homes all utilize well water for domestic consumption, and under certain circumstances, there may be a need to sample, test and follow-up with respect to these homes. On Monday morning engineer Tom Wheat reported by phone to Mr. Pierson that given (i) the leak event was not the 12" forcemain, but from a 1 ¼ inch service line; (ii) the leak location was much greater than 50 feet from any neighboring wells (closest is 175), (iii) the ground water table is at the surface in the ditchline (natural ponding exists year-round in this area with standing water in ditches and across the street), and (vi) the well log of the closest home showed 51 feet depth, he was not overly concerned with well impacts related to this event.

Other mitigating factors in this regard are:

- Ground water flow is northwest to southeast, away from the closest homes.
- Ground water gradient (movement of ground water) is estimated to be 0.5 ft/day, at a slope of 0.004 ft/ft (data from City of Kalamazoo records). Based on the attached table, the impact to the closest downstream wells (11698 + 11761 Yorkshire + 6142 N. 37<sup>th</sup> Street) would be within 826, 904 and 936 days respectively.
- The surface of the ground had recently been frozen and the ponding of wastewater appeared to be limited to above grade ponding at this point on the west side of road only.
- Upon thawing (temperatures reached 36 degrees on Wednesday, March 4<sup>th</sup>, and 60 degrees on the 5<sup>th</sup> + 6<sup>th</sup>) the ground would act as a filter for any wastewater bacteria, preventing migration of bacteria off-site.
- As the soils begin to thaw with the warmer weather, the Authority would remove any traces of wastewater and place lime on the ground as a conditioner.

(attch p. 10, 11, 12: List of properties within 800 feet, and evaluation of when, if ever, their wells would be impacted + map of area and homes showing groundwater flow.)

Clean up of area: As noted above, Mr. Bowman contacted Plummer's septic service and on Sunday the contractor vacuumed the area of any non-iced accumulation during the excavation. Approximately 800 gallons of water mixed with soil particles and wastewater were taken away and disposed of at the Authority pumping station north of the site. On Monday, Plummer's attempted to vacuum any residual wastewater and they removed 12,000 gallons of water and

sewage without a significant drop in the water level in the ditch on the south side of drive (high ground water area). Continued low temperatures inhibited the work with frozen conditions.

On the following Friday, five days later, with temperatures in the 60's, Plummer's returned and vacuumed out 5000 gallons of wastewater residuals in the flooded ditchline. The groundwater north of the ditchline had receded, and Mr. Bowman spread 35 lbs. of dry lime over the affected areas north of the drive. South of the drive, the water had receded somewhat and Mr. Bowman spread 15 lbs. of dry lime over the exposed areas south of the drive.

(attch p 13,14,15,16,17: pictures depicting the lime applied to the clean up areas)

Estimated gallons discharge: It is not known how long the ½ inch x 1½ inch triangular opening in the service line has been leaking. Using known static and operational pressures for the forcemain and the operational hours of pump station #1 (16 hours per week = 2.28 hours / day = 137 minutes per day, it is calculated that a *maximum* of 46,421 gal/day would have escaped. This is a worse-case assumption if the flow discharge was non-stop even during static conditions of the forcemain, which may or may not be true. If the event was for 72 hours (3 days), then between 40,000 – 139,000 gallons may have been discharged.

(attch p 18: Calculations page on maximum gpm discharge per day)

Follow-up: Mr. Pierson submitted the required SSO (Sanitary Sewer Overflow) to the MDEQ and to the Kalamazoo County Health and Community Services Department on Tuesday, March 17<sup>th</sup>. A letter was sent to all property owners in an 800 foot radius of the event location, with notification to these property owners that if they are concerned with the potential impact on their private water well, they should contact the Health and Community Services Department Supervisor, Ms. Kim Finkbeiner (269-373-5352) to discuss the potential impact relative to their specific address.

On March 14<sup>th</sup> and again on March 16<sup>th</sup>, Mr. Pierson reviewed the site and found no evidence of the leakage of wastewater upon the ground surface.

(attch p 19,20,21,22: showing areas of natural groundwater (some ice evident still) with no evidence of wastewater present.)

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