COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

* * * * *

In the Matter of:

THE COMPLAINT OF MR. LOUIS BAXTER, ET. AL.	)	
	)	CASE NO. 9028
VS.	)	
	)	
OHIO COUNTY WATER DISTRICT	)	

SHOW CAUSE ORDER

On January 18, 1984, the Commission received a complaint against the Ohio County Water District ("Ohio County") from Mr. Louis Baxter, et al., concerning the continuity of service and the water pressure available in the Pleasant Ridge community of Ohio and Daviess counties, Kentucky. Thereafter on January 19, 1984, Vicki and Tony Chapman filed an additional complaint with the Commission against Ohio County concerning the same matter.

Investigation and subsequent correspondence between the Commission and Ohio County have not resulted in the resolution of these two complaints.

Pursuant to KRS 278.260 and upon its own motion, the Commission HEREBY ORDERS that this matter be and it hereby is set for hearing on the 7th day of May, 1984, at 1:30 p.m., Eastern Daylight Time, in the Commission's offices at Frankfort, Kentucky.

IT IS FURTHER ORDERED that Ohio County shall appear and give testimony, if any it can, concerning its reasons for not

providing the required level of water service to the Pleasant Ridge community of Ohio and Daviess counties, Kentucky, and to report what efforts it intends to take to immediately improve water service in the area.

IT IS FURTHER ORDERED that the Staff Report dated March 13, 1984, attached as Appendix A be and it hereby is made a part of the record herein.

Done at Frankfort, Kentucky, this 13th day of April, 1984.

PUBLIC SERVICE COMMISSION

Chairman

Vice Chairman

Commissioner

ATTEST:

Secretary

APPENDIX A

TO: Claude G. Rhorer, Jr., Director
Division of Utility Engineering
and Services

THRU: Byrnes C. Fairchild, Chief Engineer
Water and Sewage Section

FROM: Eddie B. Smith
Public Service Engineer
Water and Sewage Section

RE: Investigation into customer complaint from Mr. Louis Baxter, et al. vs. The Ohio County Water District

DATE: March 13, 1984

BRIEF

On February 7, 1984, an investigation was made of the available water service in the Pleasant Ridge area of Ohio and Daviess counties, Kentucky. This investigation was conducted by Eddie B. Smith of the Commission staff, with information provided by John D. White, water superintendent of the Ohio County Water District.

This investigation was made in response to a complaint letter to State Representative Donald J. Blandford and forwarded to the Public Service Commission on January 18, 1984. A complaint letter from Vicki and Tony Chapman on the same matter was received by the Public Service Commission on January 19, 1984.

INVESTIGATION

The investigation included a general review of Ohio County Water District's water distribution system and a discussion of the pumping improvements made in August 1983. In addition, the area in question was visited and the situation was discussed with Mrs.

Audrey Chapman, Mr. Diamon Taylor, and Mrs. Vicki Edwards all customers of the system. A pressure recording gauge was installed at Mr. Audrey Chapman's water meter to record available service pressure for a seven day period. In addition, a pressure recording gauge was set on the discharge line of the Highway 231 pump station to monitor pump activity for the same seven day period.

The Ohio County Water District's meeting Tuesday evening, February 7, 1984, was attended by Eddie B. Smith of the Commission's engineering staff. Also present at the meeting were Mrs. Audrey Chapman, Mrs. Vicki Chapman, and several other customers to complain about their water service. They reiterated the complaints previously communicated to the Public Service Commission and expressed their dissatisfaction with the Water District's response.

At the February 7, 1984 meeting it was announced that Chairman Arrel R. Himes had resigned from the Water District's board. None of the board members were willing to accept the chairmanship and the election of a chairman was postponed. Mr. Roy C. Russell, secretary of the District's board, reported that discussions with the County Judge/Executive of Daviess County had indicated that Southeast Daviess County Water District was willing to supply water to the Ohio County Water District from their distribution system north of Pleasant Ridge. The Ohio County Water District Board voted to cooperate with Southeast Daviess County Water District and to split the cost of a waterline connection between the two systems, if feasible.

On February 8, 1984, Eddie B. Smith of the Commission staff met with Jan Kuegel, manager of Southeast Daviess County Water District to discuss their water distribution system in the vicinity of Pleasant Ridge. The discussion involved a general review of the water distribution system's configuration and service capabilities. In addition, the area in question was visited and a recording pressure gauge was set near the end of Southeast Daviess County's 4-inch pipeline south of Masonville in order to record available service pressure for a six-day period.

FIELD OBSERVATIONS AND DATA COLLECTION

On February 14, 1984, the pressure recorders were picked-up and the charts removed by Eddie B. Smith of the Commission staff (see copies attached). The recorder at the Chapman residence had been placed in the meter pit and was inundated as a result of a local rainstorm on Friday, February 10, 1984. The recorder clock quit functioning on Saturday the 11th. The other recorders were not affected and they recorded pressures continuously during the period they were in service. The pressure recorded at the Chapman residence ranged from around 35 pounds per square inch (P.S.I.) to nearly 75 P.S.I. during the time the recorder was functioning. The chart made at the Highway 231 pump station indicates that the pump station was operated continuously during the period except for approximately 3 hours on Monday afternoon, February 13, 1984. The chart shows regular and abrupt changes in the discharge pressure of the pump station. These changes suggest the activity of another pump station in the vicinity of the Highway 231 installation. John White stated that

the Rough River Water System's master meter and pump station are located south of Ohio County's pump station at Hartford. The discharge pressures ranged from 125 to 150 P.S.I. for the Highway 231 pump station excluding the time the pumps were off. The pressure fell to approximately 105 P.S.I. during the three hours the pumps were not operating.

The pressures recorded on the Southeast Daviess County Water District's system south of Masonville showed considerable activity during the day. The recorded pressures ranged from a typical daily low of 65 P.S.I. around midday to a high of 82 P.S.I. during the early morning hours.

The Highway 231 pump station is intended to fill the 150,000 gallon tank, locally called the "Hoover Hill" tank, located approximately 5.5 miles south of Pleasant Ridge. The information submitted by Ohio County in 1965 as a part of its original construction project shows this tank with an overflow elevation of 623 feet above sea level (ASL). The tank as actually constructed, however, is not located where the 1965 information indicates it to be. The tank was constructed in 1966 some 6 tenths of a mile east of the proposed location. The manufacturer's data plate on the tank gives the capacity as 150,000 gallons with a depth to overflow of 30 feet. John White stated that the tank generally maintained a water level of 15 feet.

CALCULATIONS AND DATA REDUCTION

The Hoover Hill tank was apparently relocated during the 1966 construction project. Available records do not indicate that the Public Service Commission was made aware of the change. The

existing location of the tank is at a considerably higher elevation than originally proposed. From examination of the U.S. Geological Survey's topographic map it appears that the base of the 150,000 gallon tank is constructed at an elevation of approximately 660 feet ASL (see attached map). The 30 feet head range would make the tank overflow around 690 feet ASL. Nevertheless, the District's personnel and consulting engineer continue to report that the tank overflow elevation is 623 feet ASL.

According to information previously supplied by the District's consulting engineers, Morton-Lyne and Associates, the Highway 231 pump station and Hoover Hill tank served 939 customers in 1980. For purposes of this discussion we will assume that the area now contains approximately 1,000 customers. In 1982, the District's sales averaged 165 gallons per residential customer per day. The 1982 Annual Report gives Ohio County's unaccounted-for water as 20.1% of total produced for the year. This means that the District had to supply each residential customer an average of 207 gallons of water per day. Therefore the Highway 231 pump station would have to furnish approximately 207,000 gallons per day to meet the average demands of the customers north of Hartford. In addition, Ohio County reported in 1982 that its maximum day water production was 147% of its average day production. This ratio would indicate a maximum day requirement of 305,000 gallons for the area north of Hartford.

The Highway 231 pump station contains two 25 horsepower pumps each rated at 150 gallons per minute (gpm). There is no

flow-rate meter at the pump station, so the actual output of the station cannot be directly measured. A pumping rate of 150 gpm would deliver 216,000 gallons in 24 hours - or almost exactly one day's average demand for the area north of Hartford. The consulting engineers report that 2 pumps together will supply 188 gpm or approximately 270,000 gallons in twenty-four hours. The pressure chart recorded at the discharge side of the pump station seems to support flow rates in the 150 to 200 gpm range. This means that the pump station is barely able to meet the needs of a typical day and is not capable of furnishing enough water on a peak usage day.

The situation is even more critical than the daily usage figures indicate because of the wide variation in residential water usage during a 24-hour period. Typically, little or no water is used during the midnight to 6:00 a.m. period, a large amount is used around both breakfast time and the evening mealtime, with an "average" amount used during the rest of the day. This pattern can be detected from the pressure chart recorded at the Chapman residence. From the principles of hydraulics we know that high flows produce low service pressures and that low flows produce high pressures, we can, therefore, infer usage patterns from the recorded chart. Mrs. Chapman's pressure chart suggests that the water usage in the Pleasant Ridge area was the least around midnight each day and the greatest around 6:00 a.m. and 6:00 p.m. - as expected.

Although the Highway 231 pump station can pump the "average" daily usage this does not mean that it can meet the customers' actual daily demand pattern. Water storage tanks provide the water needed during the peak usage periods of the day. Studies have shown that peak daily water usage rate can range from 3 to 15 times the "average" daily usage rate. Most guidelines, however, would give the daily peak as 4 times the average daily rate. This rate will usually occur for periods of several hours during the day. It can be, and often is, exceeded by even greater instantaneous peaks several times during the day. It is reasonable, therefore, to assume that on a typical day the peak usage rate for the 1,000 customers served by the Highway 231 pump station approaches 575 gpm for 6 hours of each day. Since the pump station can only pump around 200 gpm the water storage tank must supply the 375 gpm difference. This can only be accomplished when the Hoover Hill tank is either full or nearly so. It goes almost without saying that the pump station and tank together cannot meet the peak flow rate required on maximum usage days. Examination of the pressure chart recorded at the Chapman residence suggests that the Pleasant Ridge area averaged nearly 200 gpm for 3 hours in the morning and 3 hours in the evening during the time observed. Again, this was possible only because the pump station was operating continuously and the water storage tank was nearly full. Even under these conditions the water pressure was recorded to have fallen to approximately 35 psi on Saturday morning, February 11, 1984. Unfortunately, the Chapman's

recorder was not functioning when the Highway 231 pump station was turned off on Monday afternoon, February 13, 1984. It can be surmised, however, that the pressure available at the Chapman residence fell to 30 P.S.I. or below during the time the pumps were off.

The pressure recording gauge installed on the Southeast Daviess County Water District's system was located some 5 miles from the 150,000-gallon tank at Habit (see attached map). The daily high pressure, recorded around 3:00 a.m., of 82 P.S.I. translates to a hydraulic gradient of approximately 639 feet ASL - equal to the reported overflow elevation of the tank at Habit. During the day the recorded pressures fell to around 65-70 P.S.I. This would suggest a daily peak flow of nearly 75 gpm in the Masonville area. Preliminary calculations indicate that Southeast Daviess County could meet a demand of 140-150 gpm in the Masonville area before the pressure at the intersection of U.S. Highway 231 and State Highway 142 would fall to 35 P.S.I. This means that Southeast Daviess County could possibly supply the Ohio County Water District with as much as 75 gpm of water at the end of the existing 4-inch waterline near the South Fork of Panther Creek. However, in order for the Ohio County Water District to be able to move the water to the Pleasant Ridge area a booster pumping station would be required.

CONCLUSIONS

The Ohio County Water District's water distribution system is not hydraulically capable of providing adequate service at all times to its customers in the Pleasant Ridge vicinity. In order

to properly serve its customers north of Hartford, the Ohio County Water District must improve its ability to pump water at the Highway 231 pump station. For this to be hydraulically possible, the water system to the pump station must be reinforced by the addition of pipelines, pumps, or a combination of both. Likewise, the distribution system from the pump station to Pleasant Ridge requires additional pipelines, pumps, and water storage facilities. While the proposed connection to the Southeast Daviess County Water District does not appear to be the answer to all the problems plaguing the Pleasant Ridge area, it does offer the hope of immediate relief from some of them. In fact, it is almost the only hope for immediate improvement of the District's capability to get water to Pleasant Ridge. A long term permanent solution must be developed by Ohio County to ensure adequate service to all of its customers.

The commissioners of the Ohio County Water District have demonstrated a reluctance to accept their responsibility to provide all of the District's customers with the level of service required by Public Service Commission regulations. The District commissioners have not aggressively pursued all options available to them and have not shown a desire to take immediate action to improve the situation.

RECOMMENDATIONS

The Ohio County Water District should be instructed to appear at a hearing before the Public Service Commission to answer the complaint from Mr. Louis Baxter, et al. The District should

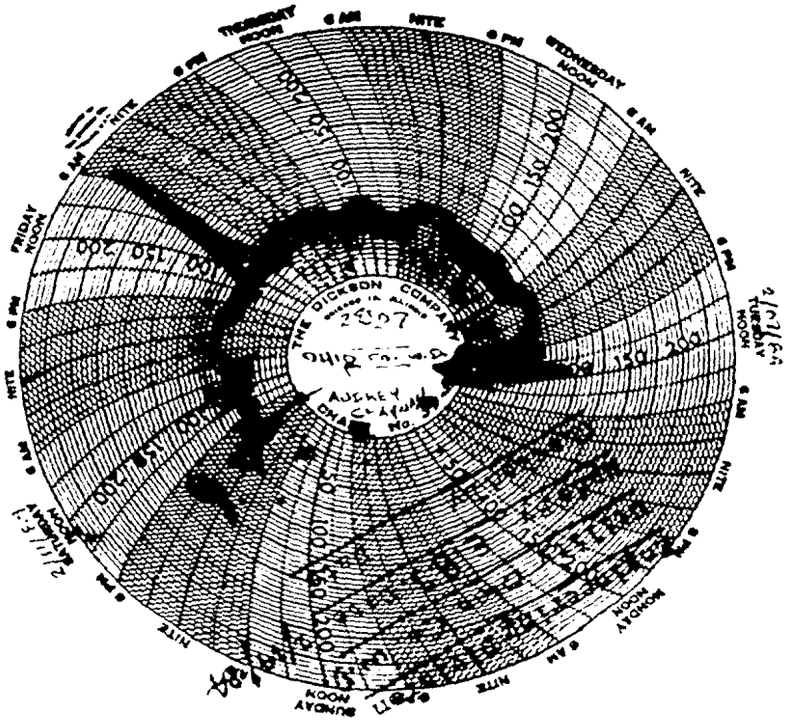
be required to report what efforts have been and are being taken to immediately improve water service to the Pleasant Ridge area. In addition Ohio County should be asked to present a program and a time table for the completion of a permanent solution to the Pleasant Ridge situation.

EBS/jsb

OHIO COUNTY WATER DISTRICT
Mrs. Audrey Chapman's residence on Bellsrun-Whitesville road in the Pleasant Ridge community, Ohio County.
February 7, 1984

OHIO COUNTY WATER DISTRICT
Inside pump station "B" on
U.S. Highway 231 north of
Hartford.

February 7, 1984

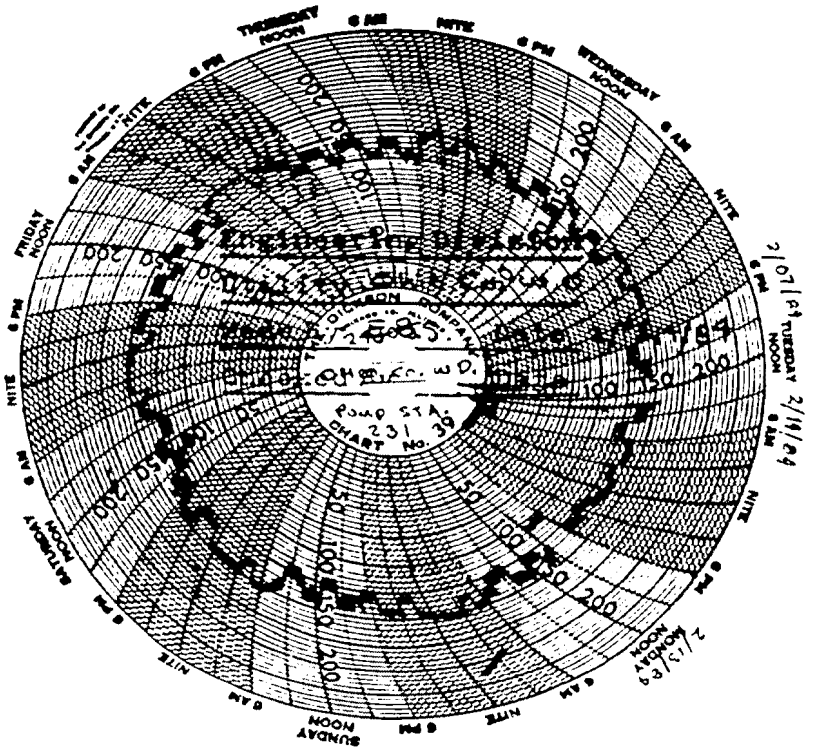


OHIO COUNTY WATER DISTRICT

Location: Mrs. Audrey Chapman residence in Pleasant Ridge community. Recorder placed on meter line.

Elevation: 522 feet ASL (Approx.)

Date: February 7, 1984 - February 11, 1984

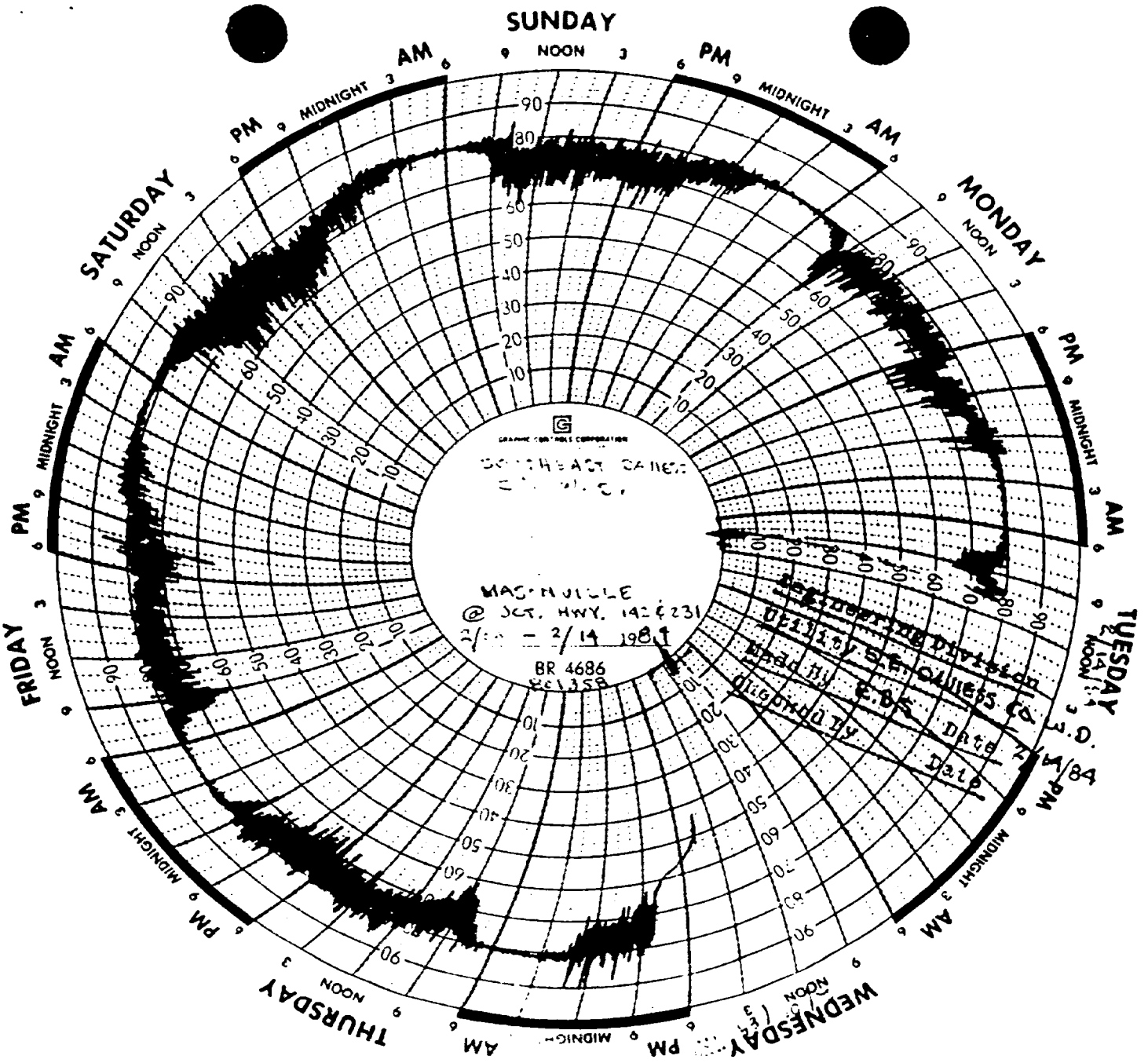


OHIO COUNTY WATER DISTRICT

Location: Pump station "B" located north of Hartford on U.S. Highway 231.

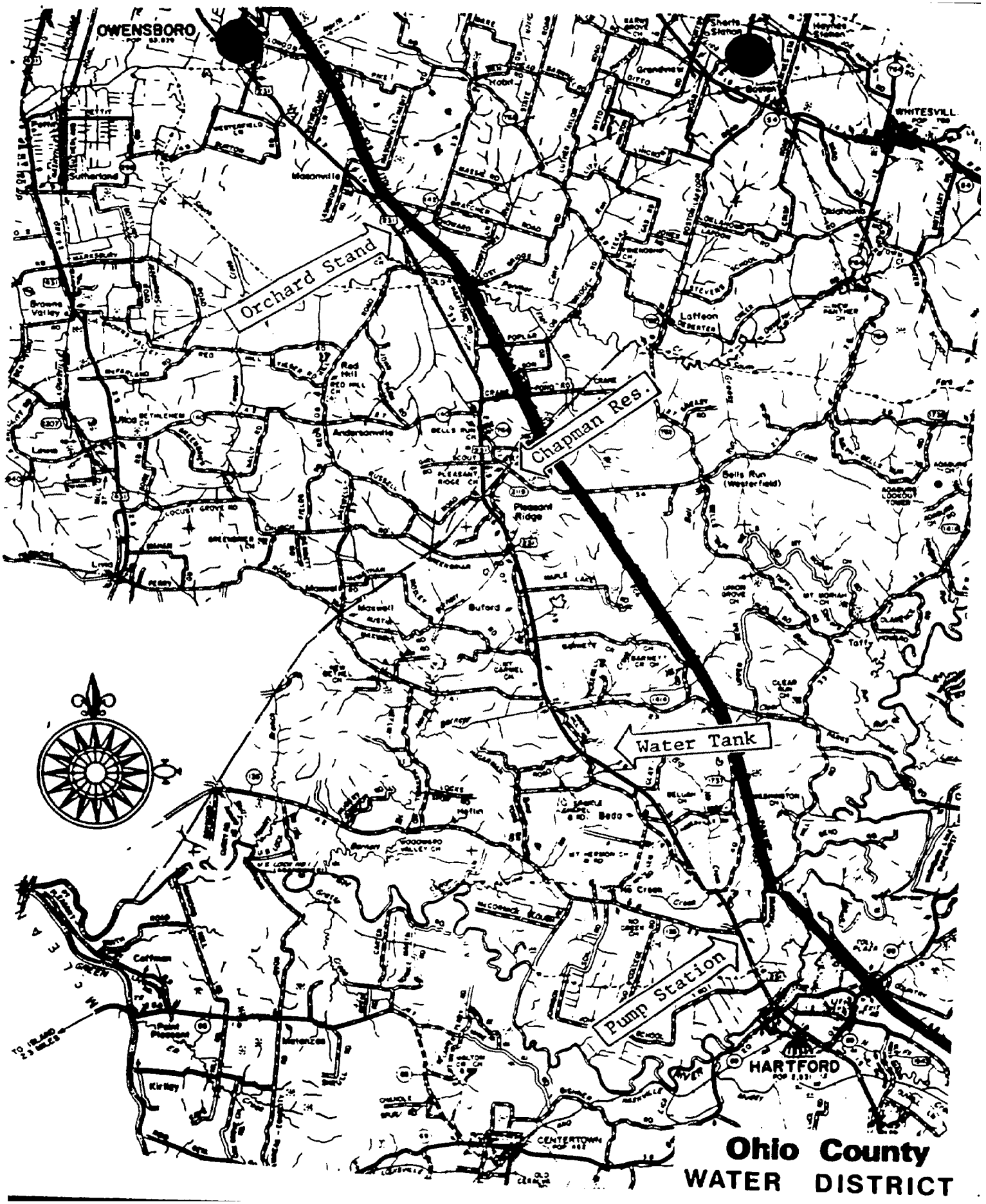
Elevation: 432 feet ASL (Approx.)

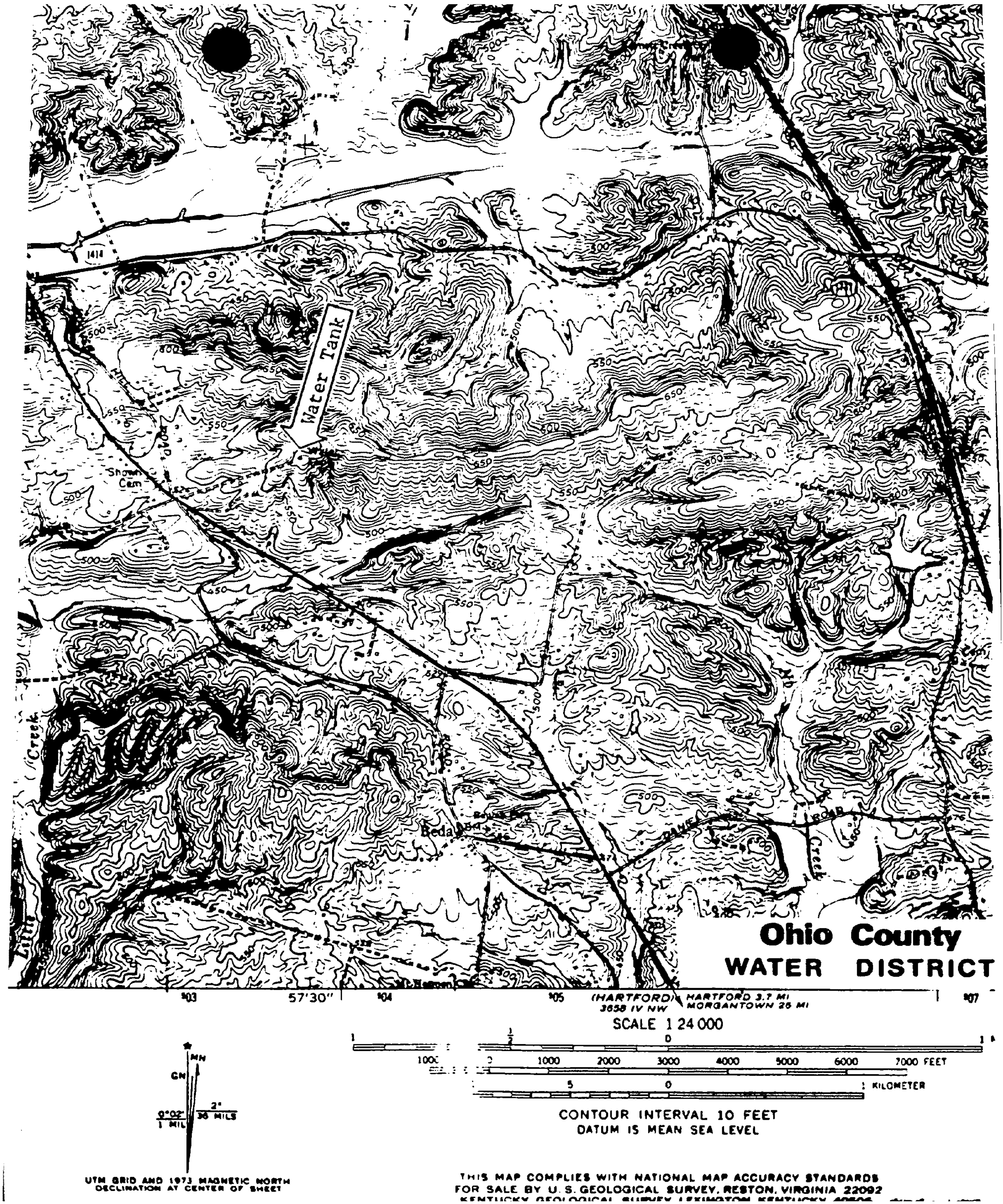
Date: February 7, 1984 - February 14, 1984

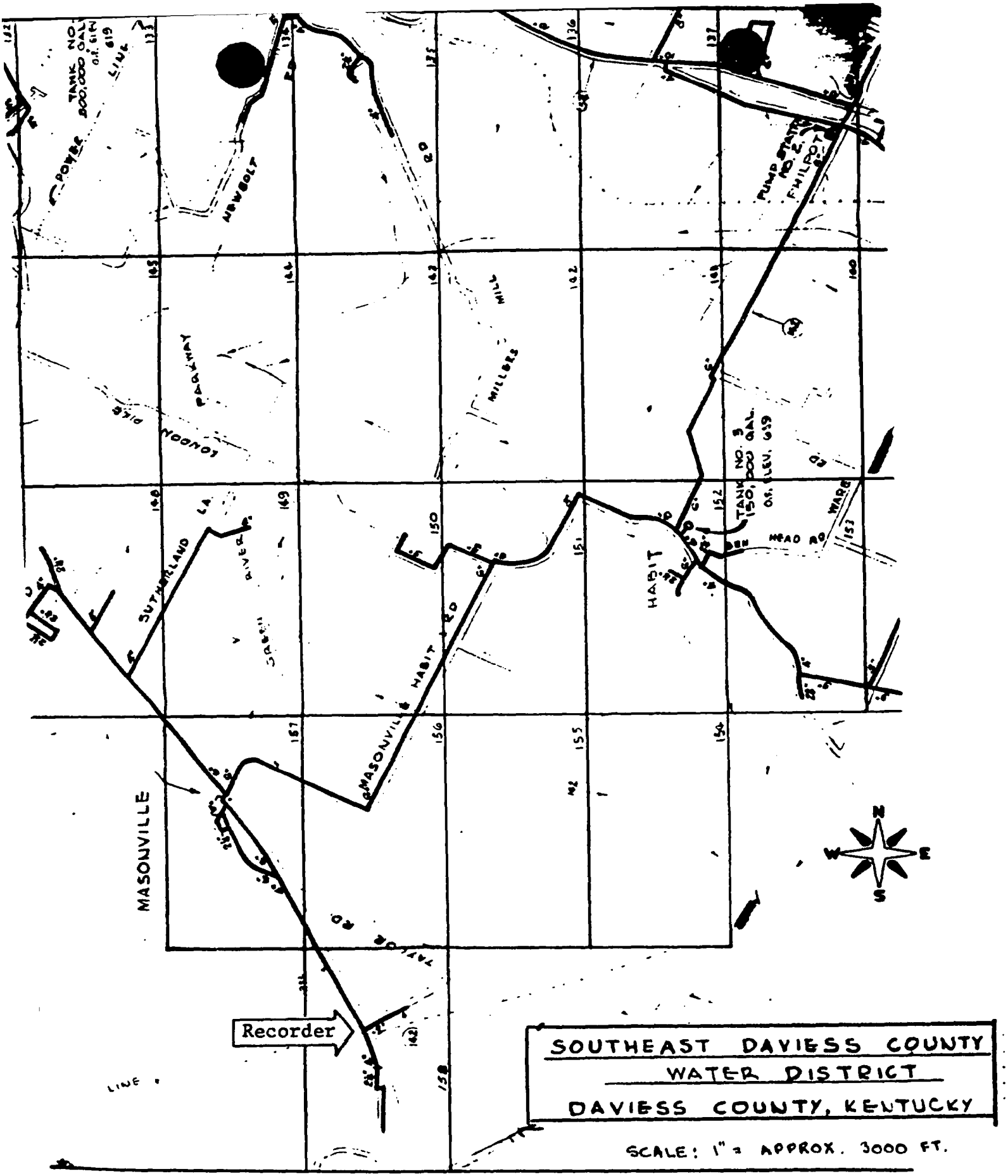


SOUTHEAST DAVIESS COUNTY WATER DISTRICT

Location:	Masonville community at the intersection of U.S. Highway 231 and State Highway 142. Recorder placed on meter line at abandoned orchard stand.
Elevation:	450 feet ASL (Approx.)
Date:	February 8, 1984 - February 14, 1984


OWENSBORO
Orchard Stand
Chapman Res.
Water Tank
Pump Station
HARTFORD
WHITESVILLE
Ohio County
WATER DISTRICT


Water Tank
Ohio County
WATER DISTRICT
1414
Shown Cem
Creek
Beda
57'30"
(HARTFORD)
3658 IV NW
HARTFORD 3.7 MI
MORGANTOWN 25 MI
SCALE 1 24 000
1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
MN
GN
0°02'
1 MIL
2°
36 MILS
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
UTM GRID AND 1973 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092


MASONVILLE
Recorder
SOUTHEAST DAVIESS COUNTY
WATER DISTRICT
DAVIESS COUNTY, KENTUCKY
SCALE: 1" = APPROX. 3000 FT.