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UNITED STATES
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GEOLOGICAL SURVEY

In reply refer to:
Technical Letter
Dribble-46, Suppl. 1

Denver Federal Center, Denver, Colorado 80225

December 19, 1966

Mr. James Reeves, Manager
Nevada Operations Office
U.S. Atomic Energy Commission
P. O. Box 1676
Las Vegas, Nevada 89101

Dear Mr. Reeves:

Transmitted herewith are two copies of:

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J.C. Ridenour - TISOR, date *5-24-67*
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TECHNICAL LETTER: DRIBBLE-46, Supplement 1

FINAL INVESTIGATIONS OF WATER-WELL COMPLAINTS RELATED TO
SALMON EVENT IN TATUM SALT DOME AREA,
LAMAR COUNTY, MISSISSIPPI

By

R. E. Taylor

Additional copies have been distributed as indicated on the
attached sheet.

Sincerely yours,

for Sam W. West
W. S. Twenhofel, Chief
Special Projects Branch

Enclosures (2)

Attachment

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By

R. E. Taylor

ABSTRACT

On October 22, 1964, the day of the 5-kiloton nuclear detonation (Salmon Event), the U.S. Geological Survey and the U.S. Atomic Energy Commission began to receive inquiries and complaints about the operation of water wells and one spring in the area around Tatum dome. On the same day, the Survey began to investigate these complaints. Inquiries and complaints were received until December 1965 and the investigations were completed in May 1966. A total of 139 inquiries and complaints were filed on 142 wells and 1 spring. The difference between this number (139) and the number of wells and one spring (143) is explained by the fact that four complainants reported two wells each.

Inspection of screens removed from 44 closed wells (31 percent of all complaints) revealed that closed-screened wells had incurred no visible structural damage but that a few motors had been damaged. The problems in most wells were due to normal well deterioration and declining water level. A preshot water-well inventory is probably one of the best means of lessening the number of complaints, of facilitating postshot investigations, and of documenting water and well conditions.

INTRODUCTION

Since 1961, the U.S. Geological Survey in cooperation with the U.S. Atomic Energy Commission has been collecting data on water wells in Lamar County and portions of Marion and Pearl River Counties as part of the water-resources investigative program of Project Dribble, Lamar County, Miss. (fig. 1). Basic data have been collected on water-well construction and condition, aquifer characteristics and delineation, and chemical and physical quality of ground water. Analysis and synthesis of data have provided an understanding of geologic-hydrologic conditions and of the physical condition of water-well systems in the area.

On October 22, 1964, the day of the 5-kiloton nuclear detonation (Salmon Event), the U.S. Geological Survey and the U.S. Atomic Energy Commission began to receive inquiries and complaints about the operation of water wells in the area around Tatum dome. On the same day, the Survey began to investigate the wells. The initial accumulation of data from the investigations was reported in U.S. Geological Survey Technical Letter Dribble-46 (Taylor, 1965). By September 10, 1965, the date Dribble-46 was issued, about 128 of the ultimate 139 inquiries and complaints on 142 wells and 1 spring had been received; but not all the 128 had been investigated. The difference between the number of inquiries and complaints (139) and the number of wells and one spring (143) is explained by the fact that four complainants reported two wells each. This Technical Letter summarizes the investigations of all (139) complaints.

Figure 1 shows the location of all inventoried wells within the minimum distance of 13 miles from surface-ground zero. Figure 2 is an enlargement of the congested 5-mile-radius area around Tatum dome. Within this radius, the preshot well inventory listed 360 wells. Outside the 5-mile radius the number and distribution of wells listed in the preshot inventory decreased with increased distance from surface-ground zero. All complaints and inquiries do not fall within the scope of these two maps because of the large distances involved in some investigations. The maps and well designations agree with those presented in Technical Letters Dribble 30 (Lang and Harvey, 1963), 38 (Taylor and Grantham, 1963), and 46 (Taylor, 1965), in which a more detailed presentation of well data is available.

TYPES OF COMPLAINTS

The water-well complaints concerned either water quality or well yield, or both. Table 1 presents a further division of complaint types into contributing factors and causes. Technical Letters Dribble 30 (Lang and Harvey, 1963) and 38 (Taylor and Grantham, 1963) presented a detailed background on water wells within Tatum dome area, including selective well-water analyses. Technical Letter Dribble-46 (Taylor, 1965) discusses in detail the complaint factors and their causes. Types of complaints varied from single type and single cause to dual type and multiple causes.

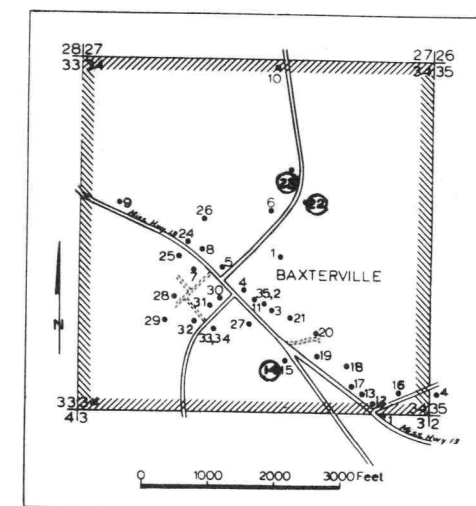
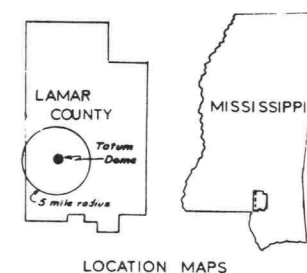
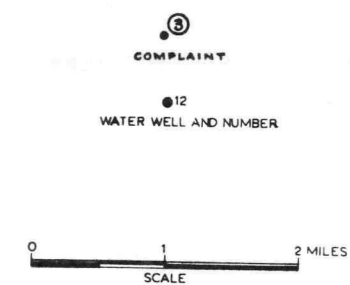
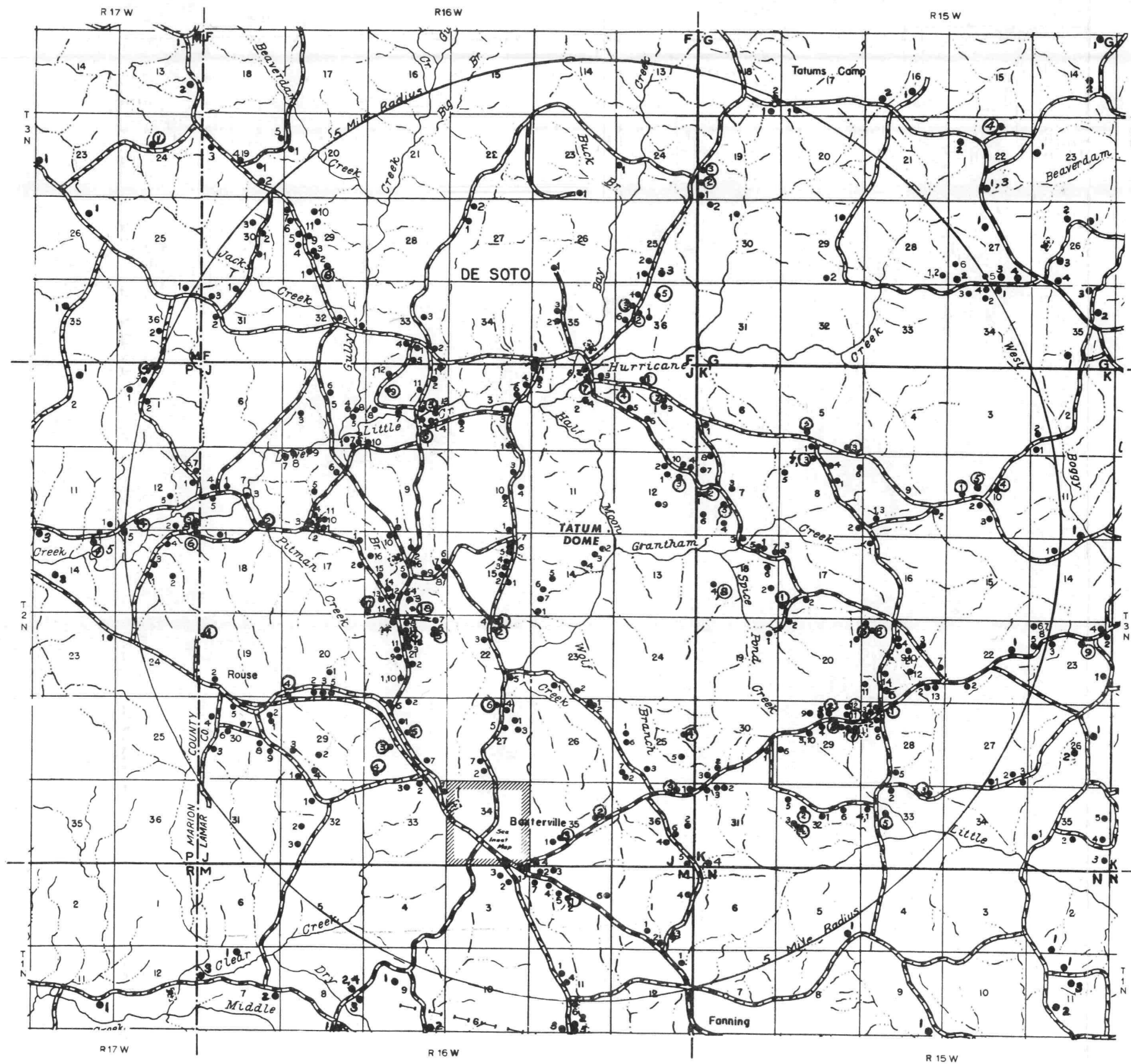


FIGURE 2.— WATER WELL LOCATIONS WITHIN 5-MILE RADIUS OF TATUM DOME, LAMAR AND MARION COUNTIES, MISSISSIPPI.

Table 1.--Types of water-well complaints

Category of complaint	Problem	Cause	Source of cause	Explanation
Water quality	Color	Iron	Ground water.	Variety of reasons, including iron content, carbon dioxide content, and low pH value of ground water; also, reaction of the water with well components, water tank, and house plumbing.
			Well pipes.	
			House plumbing.	
	Turbidity	Sediment	Closed well.	Sediment passed through the screen.
			Open well.	Sediment passed through the casing joints (tile, wood, etc.).
				Sediment accumulated at bottom of well.
Well yield	Decrease	Sediment	Chemical precipitation.	Decline of screen and well efficiency.
			Detrital accumulation.	
	No yield	Sediment	Clogged or unprimed well.	
		Pump failure (functional)	Electrical or mechanical malfunction.	

INVESTIGATIVE PROCEDURE

The investigative procedure generally attempted after receipt of a complaint report was to visit the water-well site and to identify the exact problem, note the condition of the well and associated equipment, and talk with the site owner or tenant. Basic data were reviewed next to determine if any preshot records of the well were available. Later, the well was revisited to see if the problem had diminished or ceased and to discuss the problem with the owner or tenant. On those wells in which either the problem persisted or some form of mechanical service was required, a water-well contractor assisted in the investigation and performed all manual work. The more acute and emergency problems were resolved promptly by shortening the foregoing procedure.

Figure 3 shows the cumulative increase of complaint and inquiry reports during the investigative period after the Salmon Event. The plot does not represent the actual dates that reports were received but is the number accumulated by the time of weekly administrative reports (usually dated on a Friday). Investigations began the same day as the detonation and the number of incoming reports rose quickly. Seventy-six complaints (53 percent of the total) had been reported by November 13, 1964, 22 days after the detonation. Fewer reports were received weekly after November 13, and in 26 of the next 56 weeks no reports were received.

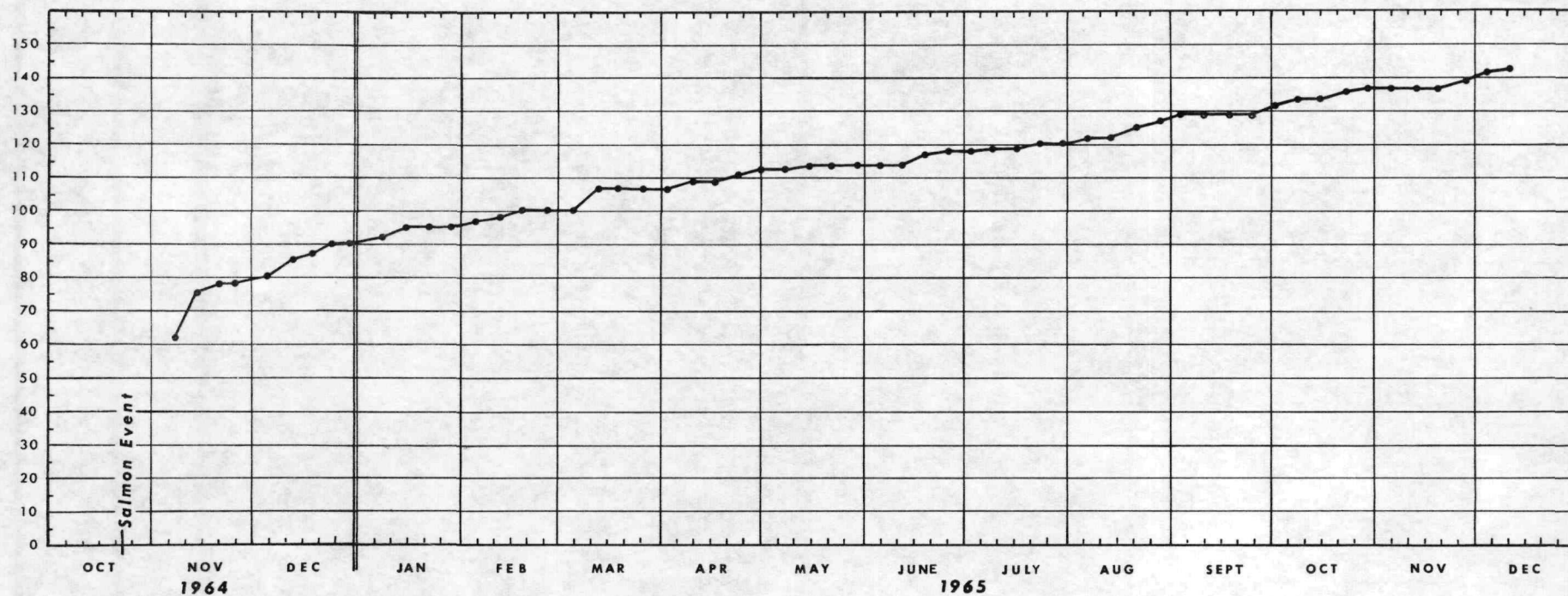


Figure 3.--Cumulative number of wells (142) and springs (1) reported with 139 inquiries and complaints on water-supply systems.

An alphabetical listing, by owner, of every inquiry and complaint received during the investigative period has been compiled in table 2 and includes location, background data, and any preshot record of the water-supply system, as well as the type of inquiry or complaint and investigation.

FINDINGS

No evidence of direct structural damage to closed wells (closed-well pipe system and screen) could be found. Some immediate effects of the detonation on closed wells were the loss of prime in a few pumps and the agitation of water in a few wells. Indirect damage to a few motors on unprimed wells was reported. Lack of water to lubricate the pump caused the motor to burn up before it could be stopped. Casing and screen from 44 closed wells (representing 31 percent of all complaints) were pulled for inspection. All the wells were in various stages of normal deterioration; namely, rust accumulation in and on well components, corrosion of screen and pipe, and sediment accumulation and encrustation in and on the screen. Casing and screen or pump column from 18 other wells were pulled by either the owner or the contractor, but the full significance of these operations cannot be determined because conditions and procedures were not observed by USGS. However, in most of these wells, normal well deterioration was reported. Deterioration through corrosion or encrustation commonly results where an iron pipe and a multi-metal sandpoint or screen are immersed in a ground-water environment. The preshot water-well inventory revealed that some wells were already becoming unusable due to deterioration.

Some damage occurred to well screens, casing, rods, and other equipment when the contractor removed these components from the well; but damage of this type can be expected from aged well equipment and the nature of the work.

Complaint reports were received on 12 open wells (open and exposed well and lift system) and 21 combination wells (closed-pipe system and screen in an open well). The nature of well construction hampers investigations of these types of wells. Of the 33 complaints, 22 represent wells outside the 5-mile-radius inventoried area; 9 of the 11 remaining wells inside the 5-mile-radius area had a preshot record of known problems. Contributing factors to problems in these types of wells may be the method of construction, large diameter casing that allows water a greater area in which to move, sediment allowed to enter unscreened well casing, and an average well age of about 17 years. A comparison of preshot and postshot measurements in eight open wells indicates that the Salmon Event had no appreciable effect on water level or total depth. At the time of the Salmon Event, water-stage recording instruments at a site 2.7 miles west of SGZ and at a site 3.9 miles south of SGZ recorded amplitudes of water-level fluctuation of 0.02 foot and 0.01 foot. The fluctuation is most likely a record of the movement of both the water and the instrument.

Open- and combination-type wells represent 23 percent of the total number of complaint reports received. An analysis of the number of open and combination wells within a known surveyed area (the inventoried 5-mile-radius area) shows that these types of wells account for

22 percent of all wells in the area. Assuming that well types within the 5-mile-radius area are representative of the region beyond, the percentage of complaints on open- and combination-type wells is nearly the same as the percentage of open- and combination-type wells in the area.

Evidently the chemical quality of ground water in the vicinity of Tatum dome was unaffected by the Salmon Event. A forthcoming technical letter will discuss the results of chemical analyses of water samples from 34 monitored water wells in the Tatum dome area. The present consensus is that turbidity changes are related to seasonal variations in the water levels.

The availability of preshot records of wells investigated within the 5-mile-radius area and of some wells investigated in the area beyond 5 miles was a big help in the investigations. Damage complaints were received on 32 wells within the 5-mile-radius circle. This represents only 9 percent of the inventoried wells within the circle. Investigations of uninventoried wells located beyond the 5-mile-radius circle were difficult because of the lack of preshot data for many wells. Adding to the difficulties of investigations, regardless of location, were those wells that the owner or contractor serviced before filing a complaint. Thus, the problem either was corrected or worsened by the time of USGS arrival, and there was no opportunity to evaluate the reported problem and the required work.

The preshot inventory of the water wells was a worthwhile procedure. Well-site visits to determine the condition of the well and the water before the Salmon Event not only helped in postshot investigations but also may have discouraged the reporting of some baseless complaints. Determining the condition of the well, pipes, and operating condition of the pump plumbing; measuring the water level, total depth of well, and yield of the pump; noting rust and staining; recording the owner's or tenant's report of past and present well operation and water condition; and obtaining a water sample where warranted: all are important data that can be checked during preshot surveys and postshot investigations. For some wells, preshot conditions of low water level, rusty water, low yield, and other evidences of water-well deterioration could have resulted in a complaint if the well had not been previously inventoried.

Variables such as well age, construction, use, and environment make it impossible to ascertain or predict complete or advanced well deterioration. These variables may also account, in part, for the lack of preferential complaint direction or distance from surface-ground zero. Further analysis of the problem is also difficult because of the human variable.

Figure 2 shows that some complaints on wells are clustered in groups of 2 or 3. This clustering may be partially due to the fact that when one owner or tenant has his well examined or pulled a neighbor may also decide to have his well examined.

Investigations utilizing water-well contractors' services resulted not only in free water-well servicing for the owners and tenants, at which time they could repair or replace defective or marginally operating well components, but also in a better evaluation of well conditions and in friendlier public relations.

RECOMMENDATIONS

Future ground-water investigations in an area that the U.S. Atomic Energy Commission uses for high explosive or nuclear detonations should use the water-well evaluation procedure that follows this paragraph. This procedure will aid in the evaluation of geologic-hydrologic alterations and in the prediction of possible water-well damage. The size of the area and the intensity of well inventory will be determined by the well density in proximity to surface-ground zero, size or yield of the detonation, depth of the detonation, and the geologic-hydrologic environment. Future work will establish and refine the system as experience is gained on the subject of explosive effects on wells. Outlines of the preshot and postshot procedures used to investigate water wells in the vicinity of Tatum dome follow:

Preshot survey of water wells whose density of coverage
decreases with increasing distance from SGZ

1. Obtain inventory and record of past well performance; determine present condition of well, yield of the pump, and water level; and obtain a water sample. The number of water samples obtained for analyses will be determined by well density and analysis costs. The number of partial and complete chemical analyses will be based on available funds. All water samples do not have to be analyzed; some samples may be held in storage until the postshot investigation determines if the sample should be analyzed for certain chemical constituents whose concentration or value will not change with time. Chemical determinations should be obtained in the field for those constituents that not only will provide an indication of the general chemical quality of the ground water but also will determine the change in chemical quality while the sample is enroute to the laboratory or is held in storage.
2. Establish (over a period of time) a monitor-well system to provide a record of physical and chemical characteristics of selected wells in the study area.
3. Obtain water samples for radiochemical analysis.
4. Measure the water level and the total depth of open wells, and of others where feasible, as late as possible before detonation.

5. Using pressure-transducer recording instruments or float-actuated water-stage recorders, record aquifer response to the detonation. An instrumentation pattern should be established around SGZ to indicate direction and distance of response. Amplitude deflection and permanent deviation of the water level will aid in geologic-hydrologic analyses and water-well complaint studies.

Postshot survey of all wells that preshot survey
indicated might result in complaints

1. As soon as possible after the detonation, measure the water level and the total depth of wells that were measured before the detonation. Periodic measurements should be obtained to document these two important items of information.
2. Routinely inspect the monitor-well system and the radio-chemical water-sampling sites.
3. Obtain local water-well contractors to perform all labor and services.
4. Investigate all water-well complaints. However, the AEC should use detonation yield, particle velocity, and other data to establish the radius of full-investigation area. There should be a cut-off distance from SGZ where well damage is very improbable or impossible and where a routine visit to the well and talk with the owner or tenant would provide the necessary information. The area of full postshot investigation would probably be similar to the area of complete or near-complete preshot well inventory.

The foregoing procedures will be applied to the Sterling Event. Of course, much information will be a carryover from the Salmon Event; and the new study will profit from and incorporate the lessons learned from the old study.

REFERENCES

- Lang, J. W., and Harvey, E. J., 1963, Well records and quality of water in the Tatum dome area, Lamar County, Mississippi: U.S. Geol. Survey Tech. Letter Dribble-30, 5 p.
- Taylor, R. E., 1965, Complaints related to water wells after Salmon Event in Tatum salt dome, Lamar County, Mississippi: U.S. Geol. Survey Tech. Letter Dribble-46, 16 p.
- Taylor, R. E., and Grantham, P. E., 1963, Basic data for domestic supply wells in a five-mile radius of Tatum salt dome, Lamar County, Mississippi: U.S. Geol. Survey Tech. Letter Dribble-38, 3 p.

Table 2.--Alphabetical listing of inquiries and complaints about water-supply systems
in the vicinity of Tatum dome, Lamar County, Mississippi

Location: Top coordinates represent direction in degrees and distance in miles from surface-ground zero (SGZ). Bottom code represents township letter designation, the section number, and consecutively inventoried well within the section; if not indicated, location is in Lamar County. This same code is used in figures 1 and 2.

Depth: Depth is shown in feet as reported by owners; depth shown in fractions of feet or in parentheses is as measured by investigators.

Water level: Depths to water levels are shown in feet below land surface; those shown in fractions of feet were measured on the date indicated.

Type of well: C, closed well (closed well and pipe system with screen); O, open well (exposed well and lift system); and X, combination well (a closed pipe system down an open well).

Type of lift: B, bucket; C, cylinder; F, natural flow; J, jet; N, none; P, pitcher; S, submersible; and T, turbine.

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Alexander, R. D.	258°-10.6 P30-1 Marion Co.	1960	60 (49.32)	45.81	Dec. 1965	O	B	WL 44.08 ft GL TD 51.70 ft GL Oct. 1961	Yield, decreased, and water level declined.	Sediment accumulating in bottom of well. Only 3.51 ft of water column now available. Normal open well problems. Water level only 1.73 ft below 1961 measurement.
Alford, J. F.	137°-69 Jackson Co.	--	300±	Flowing	1965	X	J	--	Yield, water stopped flowing.	Check of other wells in area and review of records show normal water-level decline comparable to complainant's present situation. Head still above ground level but below outlet pipe.
Alton, L. C.	135°-4.7 K33-5	1963	42	16	1964	C	J	--	Yield, decreased.	Well contractor removed sandpoint. Screen openings covered with rust. Cleaned sandpoint, reinstalled, and pumped clear water at 4 gpm.
Anderson, G. W.	067°-1.2 K7-2	1956	90	76	1956	C	C	Water red in color.	Quality, water red in color.	Water was stirred up after the detonation, but condition improved with time. Previously reported that water sometimes became red in color.
Anderson, M. L.	062°-2.6 K5-2	1956	112	60	1960	C	J	Yield, low. Water reddish color. Iron staining.	Yield, no water. Quality, colored water.	Pump inoperative but corrected later in the day of Event. Water was orange in color for a few days. Intensity of color diminished slightly. Well has a record of colored water.
Anderson, Neval	053°-1.1 J12-3	1951±	60	30	1951	C	J	Water clear.	Quality, water stirred up and has some sand grains.	Pumped well, water clear at 2 gpm. Sand does not seem to be major problem. Owner mostly worried about possible loss of well from detonation.
Anderson, R. L., Jr.	115°-1.4 K18-8	1963	78	--	--	C	C	Low yield, strainer stopped up.	Yield, decreased.	Well condition same as preshot. Yield started decreasing before the detonation.
Barker, J.	113°-2.2 K17-1	1947	110	78	1947	C	J	Water reddish color.	Yield, decreased.	Pumped well without producing any noticeable yield change. New owner not familiar with well.
Batiman, Evan	330°-18.2 Marion Co.	--	--	--	--	C	C	--	Yield, no water.	Daughter reported well stopped producing, but well has returned to normal now.
Batson, J. L.	269°-6.3 P14-4 Marion Co.	--	22 (13.5)	Dry	Dec. 1965	X	J	--	Quality, water cloudy. Yield, decreased, later no water.	Well failed about 10 months after Event. Could have been result of low water table and plugging of the aged well.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Baxter, M. A.	173°-9.2 C31-1 Pearl River Co.	1951	160	27	1961	C	C	Water, red in color.	Quality, water became muddy, later sandy. Yield, no water.	Owner did some work on well, including installing new leathers, which could have upset the sand pack. Later the well stopped producing, and owner's well contractor recommended drilling new well. Probably normal deterioration choked off water.
Beach, Glenn	110°-3.4 K21-8	1962	92	57+	1962	C	J	Water, clear.	Quality, water stirred up. Yield, decreased.	Water stirred up by detonation but problem quickly abated to owner's satisfaction. In Aug. 1965, there was a new complaint. Well contractor pulled well to reveal a rusty and encrusted system. Owner had plastic strainer installed at his expense while well was pulled.
Beach, H. T.	110°-3.3 K21-5	1951	62	40	1951	C	C	Rusty water.	Quality, water stirred up.	Owner reported clear water and same yield as before detonation. Difficulty cleared up in one day.
Beach, Ottis	289°-5.8 P1-4 Marion Co.	1955	47	30	1963	C	C	Stains fixtures-iron.	Quality, water stirred up, pumping sand and mud.	Owner is a well driller and decided to pull casing himself to check for damage. Casing stuck during reinstallation. Owner reported no damage to pipe, etc. Owner corrected his own-made problem.
Blackwell, R. O.	045°-20.7 Forrest Co.	1958	185	80	1958	C	J	--	Yield, decreased.	Owner reported yield as 6 gpm. Unable to check water at well, used yard faucet. Yield looked very good.
Bounds, Houston	015°-4.3 G19-2	1949	106	24+	1949	C	C	--	Quality, water red in color. Yield, decreased.	Well contractor pulled pipe, cleaned, and installed new equipment. Water clear but owner now unsatisfied with yield. Another contractor pulled casing and found low water level and encrusted strainer. Rods were lowered and new strainer installed at owner's expense. Plenty of good clear water now.
Breakfield, J. B.	310°-7.2 M24-1 Marion Co.	1949	87	78	1961	X	J	--	Yield, decreased.	Well contractor pumped well. Less than 9 ft of water column in well in 1961. Well naturally running out of water with normal decline in water table throughout area.
Breazeale, Lavell	071°-3.0 K5-3	1956	88	60	1956	C	J	Clear water.	Yield, decreased.	Well contractor made adjustments on surface components of pump. Problem alleviated.
Brewer, Mathie	093°-19.3 J18-1 Forrest Co.	1963	30	16.80	1964	X	C	--	Yield, decreased. Quality, water sandy and muddy.	Original well going dry, so owner drilled identical well about 12 ft away. Believe the problem is a combination of natural well deterioration, normally declining water table, and pumping interference between the two wells.
Do.	093°-19.3 J18-2 Forrest Co.	1963	30	16.80	1964	X	J	--	do.	Do.
Brock, G. W.	109°-22.0 L17-1 Forrest Co.	1964	140			C	J	--	Yield, no water.	A new well completed in Aug. 1964. Plastic casing has worked loose from pump since construction. No damage.
Broome, A. J.	025°-9.7 D34-2	1950	50	40	1961	C	J	Iron problem noted. Well deepened in 1961.	Yield, no water.	Yield decreased and later production stopped. Well contractor pulled pipe, cleaned, and jetted well clean. Plenty of good water now that normal well accumulation was removed.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Broome Construction Co.	080°-10.8 L3-3	--	--	--	--	C	J	--	Quality, water red in color.	Pumped well and water was clear. Well contractor believes problem is inherent to the system.
Broome Construction Co., tenant house	079°-10.9 H34-2	--	--	--	--	C	C	--	Quality, colored water.	Unable to obtain information; complaint not pressed.
Brown, Allen	124°-17.4 M6-1 Forrest Co.	1957	80	50	1957	C	J	Well reworked 1962 $\frac{1}{2}$.	Yield, decreased.	Pumped well and water was clear. Believe that excessive time required to fill tank is due to normal well deterioration.
Brown, T. R.	043°-6.7 G22-4	--	60	near surface	1964	C	C	--	Yield, no water.	Owner attempted to pull the pipe and broke it. After fishing operation, equipment was removed, cleaned, and reinstalled. Well yields a good quantity of clear water.
Bunch, H. D.	122°-10.5 08-2	1956	530	160	1964	C	C	--	Quality, colored water. Yield, later no water.	Owner had his contractor work on well prior to receipt of report. Immediate investigation found well repaired and pumping a good quantity of clear water. Owner reported a rod had broke in bottom of well; new rod and cylinder installed.
Burge, Horace	012°-1.8 J1-1		120	99	1961	C	C	Water clear.	Inquiry.	Owner requested radiation survey of well water. Sample taken to Test Site. Results were reported NEGATIVE.
Do.	006°-1.7 J1-4		29.5	18.95	Oct. 1964	X	J	Water clear. Yield, low.	Quality, colored water.	Water cleared in a few days.
Burt, J. C.	100°-18.6 H36-1 Forrest Co.	1930	80	65	1930	X	J	Colored water (rusty).	Quality, colored water.	Owner reported that before Event water occasionally became colored. However, water didn't clear after the detonation.
Busha, John	123°-3.8 K28-1	1955	102	--	--	C	C	Iron problem.	Quality, water red in color. Yield, no water.	Well contractor pulled pipe and found worn out leathers and check valve spring. Repaired, reinstalled, and pumped out dirt and rust. Good yield of clear water. Later found hole in casing through which air was entering system. Normal well deterioration.
Cain, Claude	130°-3.7 K29-8	1961	70	37.0	Feb. 1966	C	J	Stains fixtures.	Yield, decreased.	Well contractor pulled casing and found encrusted screen. New screen installed at owner's expense. Good quantity of clear water now.
Cain, John	126°-3.5 K29-12	1950	73	40	1950	X	J	Water clear.	Yield, decreased.	Well contractor worked on surface components to alleviate the problem.
Cargill, C. G.	043°-21.9 B29-1 Forrest Co.	1961	96	40	1960	C	J	--	Yield, decreased.	Owner reported that yield is not as much as before Event, and water is colored (rusty) at times. Normal well deterioration.
Childers, Mrs. Frank	353°-17.7 A16-1	1945	70	60	1961	X	C	Water clear.	Yield, no water.	Owner had own contractor work on well. Yield of well is low. Only 10 ft of water in well in 1961. Problem is normal water-table decline in area and natural deterioration of 19-year old well.
Coastal Chemical Co.	051°-21.0 Forrest Co.	1947	--	--	--	C	T	--	Quality, sand in water.	Well contractor pulled casing and found breaks in liner above screen. Wire wrapped screen had a variety of space openings and the iron part of liner was corroded. Water analyzed at well for corrosiveness.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Courtney, A. O.	203°-3.6 J34-23	1959?	130±	--	--	C	C	Good water.	Yield, decreased.	Well contractor pulled rods, checked bottom valve, installed new leathers, cleaned, and reinstalled. Good quantity of clear water.
Courtney, Alfred	129°-4.9 K33-3	1940	50 (45.22)	32 25.45	1961 1965	C	J	Good water.	Yield, decreased.	Well contractor pulled casing. Screen was encrusted. Contractor installed new screen at owner's expense. Good quantity of clear water.
Dean, O. L.	070°-16.4 F16-1 Forrest Co.	1964	100	59	1964	C	J	Water clear.	Yield, no water.	Well contractor removed equipment. Check valve was worn out and stuck. Pump yields a good quantity of clear water now.
Debrow, Vollie	160°-2.6 J25-4	1956	65 (61.83)	35.12 37.89	1961 1965	O	B	Water became cloudy and muddy at times.	Quality, water sandy and muddy.	Water occasionally sandy, muddy, and dirty prior to the Event. Normal variation of open-type well. Water reported clear since complaint and Event. Cracking of cement also reported.
Diamond, H. R.	225°-3.5 J28-5	1957	110	--	--	C	C	Rust stain.	Quality, water red in color.	Owner removed pipe and cleaned everything. After pumping to remove loose rust, well produced good quality of clear water.
Dickens, Evan	353°-11.2 C15-1	1963	48	--	--	C	C	--	Quality, water red in color. Yield, decreased.	Well producing air, and water is red in color. Yield decreased, and when yield ceased the owner pulled the well himself. The check valve was fixed and well operating normally now.
Diermayer, Mrs. Hubert	151°-14.0 D13-1 Pearl River Co.	1949±	90 (86)	35	1949±	C	C	--	Quality, water red in color.	Well contractor pulled casing. Pipes were corroded and screen was encrusted. Owner had new strainer and cylinder installed at her expense. Well now better.
Dobson, A. C.	071°-2.6 K8-3	1952	130	80	1960	C	C	Water red color.	None	Owner claims to have fixed his own well.
Elliott, L.	149°-7.6 N16-1	1954	67	18	1954	C	C	--	Yield, no water.	Well stopped producing Oct. 25, 1964. Well contractor pulled pipe and found material holding the bottom check valve open. Cleaned and reinstalled equipment, well yields good quantity of clear water.
Entrekin, J. E.	147°-4.2 K32-4	1960	105	40	1960	C	C	Rusty red color.	Quality, sand in water.	Well contractor pulled well. Installed new strainer and casing at owner's expense. Normal well deterioration.
Entrekin, Roland	145°-4.1 K32-2	--	85	--	--	C	J	Water good.	Yield, decreased. Quality, sand in water.	Owner worked on well himself, reported that strainer was damaged. He installed new strainer. Well yields good quantity of clear water. Owner made complaint after working on the well.
Fairchild, Stanford	251°-3.1 J16-17	1960	45±	--	--	C	J	Water good	Yield, no water.	Owner reported that after returning home from Event evacuation, he found the motor burned out. Owner had motor rewound and switch replaced.
Gibson, B. M.	006°-2.7 F36-3	1949	74	62	1949	C	J	Clear, low yield.	Yield, decreased.	Well contractor removed naturally deteriorated well strainer. Installed new strainer at owner's expense. Well yields good quantity of clear water.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Gibson, J. C.	013°-2.8 F36-5	1949	75 (76.50)	67 62.10	1949 1966	X	J	Water clear.	Quality, water sandy and muddy.	Well contractor removed pump from open well. Could not see any leaks above water level through the curbing. Bailed some sediment out of well. Problem could be season variation of water column in well.
Gibson, W. M.	008°-2.6 F36-2	1921	82	16	1953?	X	C	Water clear. Yield low.	No well problem.	Structural problem, pump leaks and sitting above the ground. Detonation may have collapsed material supporting the pump.
Goens, Elwood	310°-12.4 H32-1 Marion Co.	1957	250	--		C	C	--	Quality, water oily and rusty.	Oil in water never confirmed. Film on water may be fine rust. Large quantity of rust removed from water tank. Water occasionally rusty. Contractor pulled pipe, cleaned equipment, and jetted well. Believe highly deteriorated well system.
Hatton, Virgil	077°-1.4 K7-5	1961	60 (65)	30 48.0	1961 1964	C	J	Water clear.	Yield, no water.	Well contractor pulled pipe and found bottom check valve stuck open by material loosened by the detonation. Cleaned equipment, reinstalled, and pumped good quantity of clear water.
Herrin, A. L.	256°-5.0 J19-1	1955	96	96	1961	C	C	Water clear.	Quality, colored water.	Owner worked on well and became stuck. Well contractor pulled pipe, fixed bottom check valve, reinstalled, and pumped good quantity of clear water.
Herrin, John	275°-5.0 P12-3 Marion Co.	1958	16	8	1958	C	J	Water clear.	Yield, decreased. Quality, sand in water.	Owner had new 21-foot well drilled. Old pump burned out after pumping sand. Yield decreased until failure. Original pipe and strainer encrusted and strainer full of sand. Believe main problem to be caused by normal well deterioration and declining water table.
Herrin, Milton	134°-7.7 N11-3	1959	65 (60.5)	53 53.99	1959 1965	C	C	--	Yield, decreased.	Well contractor adjusted pump the first time. Later contractor pulled casing and found water level below top of encrusted strainer. Leathers and check valve were worn out.
Herrington, Jack	300°-2.6 J4-6	1952	20	6	1961	C	J	Water clear.	Yield, no water.	Well contractor cleaned electrical connections and checked pump. Well yielded a good quantity of clear water.
Hession, Leo	079°-18.9 F25-1 Forrest Co.		70	30±	--	C	J	--	Quality, sand and rust in water.	Owner cleaned tank twice and allowed well to pump in effort to clean out well. Believe normal well deterioration.
Holston, J. T.	177°-13.1 B24-1 Pearl River Co.	1956	237	147	1961	C	C	Iron problem.	Yield, no water.	Owner had new 75-foot well drilled after he decided that it would be too expensive to pull the old well. Believe normal well deterioration.
Holston, Jack	134°-19.0 M19-1 Forrest Co.	1950±	312	--	--	C	C	--	Yield, decreased. Quality, sand in water.	Well contractor pulled the casing and cleaned sand and rust from well. Strainer was deteriorated. Owner had new strainer installed.
Holston, James	134°-16.0 F2-1 Pearl River Co.	1957±	50 (35)	--	--	C	C	--	Yield, decreased. Quality, sand, red mud, and trash in water.	Well contractor removed rods, replaced worn out leathers and valve, cleaned, and reinstalled equipment. Water cleared.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Hughes, Mrs. John Q.	044°-17.2 E12-5		110	--	--	C	J	--	Quality, odor.	Inspected water, bad iron taste and odor. Well contractor also believed that problem was iron in the water and no detonation damage. Small water column in well. Normal well deterioration.
Johnson, D. W.	269°-10.6 P18-2 Marion Co.	1946	30	--	--	C	J	--	Yield, decreased.	Yield decreases as well is pumped. Owner reports that he has to replace encrusted strainer every couple of years. Believe problem is declining water table, encrusting strainer, and shallow type jet pump.
Johnson, E. H.	265°-5.0 Marion Co.	--	--	--	--	--	--	--	Yield, spring stopped flowing.	Owner reported that spring went dry but after a good rain it started flowing again. Owner said water tasted like pond water. A visit to the site in June 1965 found the spring dry; other visits found water flowing. Spring fed by small hill, believe condition is seasonal.
Johnson, J. A.	072°-13.0 C18-3	1960+	237	34	1966	C	J	--	Quality, colored water. Yield, decreased.	Water became colored right after shot and 3 weeks later water yield declined. Well contractor removed an almost completely encrusted strainer. Owner had new strainer installed at his expense.
Johnson, J. D.	187°-4.4 M2-1	1960	175	90	1960	C	S	Water good.	None.	Owner away but had well contractor at site. Owner dropped complaint. No information available.
Johnson, R. H.	083°-4.2 K10-1	1938	68	43	1961	C	C	--	Yield, decreased.	Owner had his well contractor install new rods, but owner was not satisfied. Another contractor inspected and adjusted pump. Believe natural deterioration of aged well.
Do.	082°-4.5 K10-5	1960	90			C	C	--	Inquiry.	Well contractor checked well and pump at tenant's house. Contractor could not find anything wrong.
Keeton, J. J.	183°-3.5 J35-2		60+			C	J	Water red color.	None.	The tenant said that he would fix the well himself. Reported that water became red in color.
Landrum, John Z.	135°-20 M19-2 Forrest Co.	1954	284	90	1954	C	C	--	Quality, colored water. Yield, decreased.	Water cleared in about 3 weeks. Well contractor believed that encrusted strainer has choked off water intake to well. Normal well deterioration.
Lawson, Ed	239°-2.5 J21-5	1961	95	83	1961	C	J	Water clear.	Quality, water stirred up.	Water cleared up the day following the Event.
Little, H. S.	043°-19.2 Forrest Co.	1935	60	--	--	C	C	--	Quality, muddy water.	Owner removed pipe and strainer, cleaned, and reinstalled. Problem persisted. Owner put down new well the same depth as original well. Water was clear. Believe problem to have been an aged and deteriorated well.
Lott, Jesse	016°-15.0 B34-1	1957	65	30	1961	C	C	Good quality.	Quality, rust and sand in water. Yield, no water.	Quality water inquiry at first. Well failed in March 1965. Well contractor removed equipment. Cylinder and screen full of mud and rust. After new equipment installed, well yielded a good quantity of clear water.
Lowery, J. R.	351°-14.3 A33-1	1955	263	110	1961	C	C	Fair quality	None.	A yield problem was taken care of by owner. No complaint.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Lucas, Grady D.	266°-7.3 P15-3 Marion Co.	--	16.01	9.54	1965	C	J	--	Yield, no water.	Owner had new 167-foot well drilled. No attempt made to check or rework original shallow well.
Lumpkin, John	152°-19.2 K5-1 Pearl River Co.	1953+	287	--	--	C	C	--	Quality, water red in color. Yield, decreased.	Owner reports water is real bad after well is not pumped for a period of time. Believe natural well deterioration.
Madden, Floyd	030°-8.8 G3-2	1947	29 (23.2)	18 12.69	1961 1965	O	B	Good quality. Adequate yield.	Quality, colored water. Yield, decreased.	Water cleared next day. More water column now than in 1961 inventory. Depth decreasing due to normal aging.
Marion County Central School	272°-10.6 L16-1 Marion Co.	1958	535	Flowing	--	C	S	--	Inquiry.	School has identical wells about 50 ft apart. Water leaks through casing seal. Decreasing flowage pressure due to declining head and pumping interference.
Do.	272°-10.6 L16-2 Marion Co.	1958	535	Flowing	--	C	S	--	do.	Do.
McBride, A. M.	318°-12.3 H21-1 Marion Co.	1954	120	60	1954	C	J	--	Yield, decreased.	Well contractor pulled pump and jetted well, reinstalled, and obtained plenty of water. Later owner had another well contractor drill a new well. Water could not be obtained near original well but had to move about 300 feet away.
McSwain, Mrs. Irene	082°-32 Perry Co.	1950+	<100	--	--	C	-	--	Yield, decreased. Quality, sand in water.	No data available, owner (John V. Hinton) died and left the property to daughter who doesn't know much about the well.
Mills, E. P.	350°-1.8 J2-7	1964	14	5	1964	C	J	Low yield.	Quality, water orange in color.	Water cleared in a few days. Owner pumped well to flush the water system.
Mills, Lloyd	280°-19.2 Marion Co.	--	200	Flowing	--	O	F	--	Yield, no water.	Owner reported that yield decreased and then ceased. Well contractor attempted to jet sand out of well unsuccessfully. Contractor drilled identical well about 10 ft from original well, and a good quantity of clear water flowed.
Minter, G. E.	049°-12.3 E33-2	1962	98	--	--	C	J	--	Quality, water muddy. Yield, decreased.	Owner dissatisfied with water quality since Event, also yield has decreased. Well contractor removed an almost completely encrusted strainer. No evidence of structural damage; normal well deterioration.
Morris, B. H.	023°-12.4 D15-4	--	--	--	--	C	J	--	Quality, water rusty and muddy. Yield, decreased.	Well contractor cleaned and adjusted some components. Good quantity of clear water now.
Moulder, Chester	052°-17.8 Forrest Co.	1963	69	--	--	C	J	--	Yield, no water.	Well contractor worked on well and obtained water. Owner said yield was low. Later owner moved away and sold house.
Myatt, Mrs. Felix	135°-14.1 F4-1 Pearl River Co.	1959	92	--	--	C	C	--	Quality, water muddy and rusty.	Owner reports water became muddy and rusty after Event. Rusty water prevalent when water first comes on; water clears after running a short time. Normal well deterioration.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of well	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Nobles, Charles	006°-9.4 C25-3	1960+	74.0	57.94	Jan. 1965	C	J	--	Quality, sand in water.	Owner reports sand in water after Event. Well contractor pulled casing. Screen was corroded; holes allowed accumulation of sediment inside screen. New plastic strainer was installed at owner's expense.
Nobles, W. H., Sr.	084°-4.7 K10-4	1947	67	37	1947	C	C	--	Quality, water red in color. Yield, no water.	Water became rusty, and yield decreased until failure. Well contractor worked on well; owner wanted new plastic strainer installed at his expense. Good quantity of clear water now.
Overstreet, L. A.	022°-8.3 G4-4	1962	65	34	1962	O	B	--	Quality, muddy water. Yield, no water.	Owner reported his open-tile well had muddy water, and well went dry 3 months after Event. Investigation of complaint impossible as owner filled the well up with bricks and other material to keep children from falling down the 8-inch diameter well.
Owens, Hardy	130°-7.8 N11-4	1915	35.40	--	--	X	P	--	Quality, muddy water.	Owner reported muddy water after the Event but the water was clear when checked. Repeated visits revealed that water was still clear.
Pace, Robert	027°-8.9 G3-5	1957	35+ (32.5)	11.73	1965	X	J	--	Quality, muddy water.	Repeated visits to well revealed water was muddy. Well contractor deepened well and put pea gravel in bottom of well. Water was still muddy. Pump runs out of water in a few minutes. New well had to be drilled to about 86 feet before good supply of clear water was obtained.
Parker, C. S.	015°-7.9 G5-1	1950+	33.6	16.22	1965	O	B	--	Quality.	No investigation, complainant found the trouble and dropped the claim.
Perkins, R. H.	159°-11.7 D9-2 Pearl River Co.	1959	49	20	1964	C	J	--	Quality, water red in color. Yield, no water.	Water was red in color during the November visit. In February it was reported that after our last visit the well quit yielding water. Owner's well contractor found broken pipe and water tank and strainer stopped up. The well was deepened 10 ft and new pipes installed from tank to the house. Our investigation revealed that strainer was corroded and filled with rust and sand, the water tank had rusty holes in it, and pipes were corroded. The water tank and pipe problem did not occur until after our visit. Believe normal well deterioration, corrosive water, and declining water table were the problems.
Pierce, M. T.	064°-25.5 Perry Co.	1957+	100+	--	--	C	J	--	Quality, sand in water.	Probably normal well deterioration.
Polke, Clifton	010°-9.5 D30-2	--	42.0	34.0	1964	X	J	--	Quality, sand in water.	Owner removed pipe from open well and cannot get strainer back down. Pumping red sand while attempting to reinstall pipe. Strainer has very large openings that cannot keep sand out of system. Removal of strainer by the owner destroyed any natural gravel pack that may have developed around the intake. Well contractor worked the pipe down the well.
Porter, John J.	087°-42 Perry Co.	1924	440	Flowing	1965	O	F	--	Yield, declining head. Quality, some trash.	Owner reports height of flowing water is declining. Checking piezometric surface in the area revealed that head about +10 ft. Water flows out of owner's pipe that is over 7 ft high.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Pyland, V. G.	092°-10.4 L15-1	1954	400	100	1961	C	C	Good quality.	Yield, decreased.	Owner adjusted pressure switch. Well now yielding a good quantity of clear water.
Rawls, Allen	119°-20.8 Forrest Co.	1956†	72	--	--	C	J	--	Quality, sand in muddy water.	Water reported to be muddy and sandy when pump is first turned on after not being used for a period of time. A check of the water revealed it to be clear with a few rust flakes. Normal deterioration required that a new strainer be installed when the well was reworked about 2 years ago.
Rayborn, Selvyn	188°-3.8 J35-3	1963	154	--	--	C	J	--	Yield, decreased.	Owner's well contractor cleaned well out and installed a larger motor on pump. Believe normal well deterioration and declining water level were the problems.
Ready, R. C.	165°-3.2 J36-3	1955	72 (74.0)	40† 56.21	1961 1964	C	J	Rusty water.	Quality, colored and sandy water.	Well contractor removed a corroded and rusty screen. Owner had new plastic strainer and pipe installed at his expense.
Richardson, A. C.	350°-17.8 A17-1	1960	380	180	1961	C	C	Water turns yellow in color after heating.	Quality, colored water.	Well water is clear, hot water is colored. Usual reaction.
Robinson, Minnie Lee Lott	081°-19.3 Forrest Co.	--	--	--	--	C	N	--	Yield, no water.	Investigation, in Feb. 1966 (16 months after Event), cannot produce any reliable data. Pump was removed and well filled in.
Rushing, L. H.	242°-4.3 J20-4	1900	100	90	1961?	C	J	Water red in color.	Yield, decreased.	Owner reported that yield decreased until no water was produced. Owner's well contractor deepened the well and replaced old rod pump with new jet pump. Later, owner's son said well produced some sand which broke the rods, cut the valve, and ruined the pump. Believe normal deterioration of an aged well and declining water level are the problems.
Sargent, Henry	245°-12.3 Q12-1 Marion Co.	--	24	--	--	C	J	--	None.	Inquiry about the Event and relation to water well.
Saucier, A. D.	045°-17.3 E12-3	1947	97	--	--	C	C	--	Yield, decreased. Quality, odor.	Old well leaks and needs minor adjustments. About 10 months after Event, owner said that now the water had a bad odor. Well contractor believes only problem is age of well and iron in the water.
Saucier, Daisy	046°-17.5 E12-4	1959	310†	--	--	C	S	--	Quality, muddy water and odor.	Water became muddy after the Event and lasted for about 4 months. Odor problem has persisted. Well contractor believes the problem is the plumbing and iron in the water.
Saucier, H. L.	113°-5.8 K23-9	1960†	83†	--	--	C	C	--	Quality, muddy water.	Owner reports that after the Event the water became muddy and rusty in appearance. Five months after Event three rods broke. Later water had some sand in it and still muddy. Well contractor replaced deteriorated strainer. Well yield good quantity of clear water now.
Saul, C. M.	034°-53 Jones Co.	1963	143	--	--	C	C	--	Quality, water stains.	Owner said that rust problem existed before Event. Owner had water checked for radioactivity. Owner reported that the well blew air up the outside of the casing. He also stated that a salt layer was encountered while drilling the well.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Saul, J. I.	342°-10.3 C29-1	1950	336	141.97	1965	X	C	--	Yield, decreased.	Owner reports that trouble started in 1961. Strainer was replaced and valves needed changing every few months. Owner also said that water level declined 50 feet in 2 years. Owner had the new well drilled in March 1964. Problems occurred before Event.
Saul, J. L.	228°-1.8 J22-2	1950	52	42?	1961	C	J	Red color, rusty.	Quality, water muddy and red in color.	Well contractor removed an almost completely encrusted strainer. A few holes were seen in the screen. Rust accumulation on pipes and inside strainer. New strainer installed at owner's expense.
Saul, J. O.	230°-1.7 J22-1	1958	68 (54.78)	15? 42.63	1958 1964	C	J	Red color, rusty.	Yield, pump loses prime.	Well contractor pulled pump, jetted well, cleaned valve and pipes, and reinstalled. Pumped well and obtained a good quantity of clear water. Later owner had a new well drilled next to the house and then worked on the house so that a well contractor is unable to work over the well.
Schulz, Harmond	169°-11.1 D7-2 Pearl River Co.	1955	20	--	--	C	J	--	Yield, decreased.	Well runs out of water after removing 5 to 10 gallons of water. Owner had his well contractor work on the well. Believe shallow well, deteriorated screen, and declining water level are the problems.
Shelton, J. J., Jr.	042°-13.0 E29-4		65 (57.0)	48 43.0	1964 1964	X	J	--	Quality, water red in color.	Well contractor pulled pump and tubing. He fixed and cleaned the equipment. Nine months after Event the new tenants report that they are not getting enough water from the well.
Simmons, D. F.	093°-8.6 L17-2	1950	43	33	1950	C	J	--	Yield, decreased.	Yield decreases as well is pumped. Well contractor pulled pump and jetted well clean. Well now yields a good quantity of clear water.
Smith, Henry	241°-2.8 J21-4	1942	107	96?	1961	X	C	Iron problem, rusty.	Yield, no water.	Pump operates but does not yield any water. Well probably unprimed due to Event. Owner fixed well himself. Sixteen months later owner complained of muddy water and dirt caving in on one side of the tile well. Problem probably normal undermining.
Smith, Horace	084°-15.8 H3-1 Forrest Co.	1956+	135	--	--	C	C	--	Quality, water red in color and some sand.	When pump first turned on the water is rusty in appearance. Some sand and black material also being pumped. Owner thought black material was coal. The well contractor who drilled the well does not remember drilling through any black material. Contractor says yield is about the same as when well was first drilled. Contractor believes that the problem of both wells is normal deterioration.
Do.	085°-15.8 H3-2 Forrest Co.	1955+	--	110+	1955	C	C	--	do.	Do.
Smith, L. W.	127°-3.6 K29-11	1950+	70+	--	--	C	J	Iron problem.	Yield, no water.	Well contractor found that motor had burned. He also pulled pump and fixed check valve.

Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Smith, Lavern	250°-2.5 J16-18	---	60+	---	---	C	J	---	Quality, colored water.	Well contractor pulled pump and cleaned well. There is now a good quantity of clear water produced from the well.
Smith, Mack	129°-3.7 K29-7	1961	50± (37.77)	22.20	Nov. 1964	C	J	Iron stain.	Quality, colored water. Yield, decreased.	Well contractor removed pump, pipe, and screen. Equipment covered with rust and encrustation on screen. Everything cleaned and reinstalled. Yield increased and water cleared.
Smith, Melton W.	168°-30.2 Pearl River Co.	1964	306	160	1964	C	C	---	Quality, sand in water. Yield, no water.	Owner reported that after Event water contained sand and later no water was obtainable. The owner's well contractor said well could not be fixed and recommended a new well be drilled. New well put down few feet from original well.
Smith, Mrs. Monroe	225°-3.7 J28-3	1951	117	---	---	C	C	Required deepening 1963, drawing air. Water red in color.	Quality, water red in color.	Tenant reports that water is sometimes rusty in appearance. Records show past history of same problem.
Smith, T. W.	271°-4.2 J7-2	1949	20	13	1961	C	C	Water turns red after sitting.	Yield, decreased.	Well contractor removed pump and strainer. Contractor cleaned the encrusted strainer and reinstalled. Well now yields a good quantity of clear water. Declining water level may also add to problem.
Smith, W. O.	200°-3.8 J34-22	1948	85	65	1948	C	J	---	Quality, water rusty in appearance.	Well contractor pulled pump and bottom check valve, jetted well, cleaned equipment, and reinstalled. Pumping the well produced red water, then clear water. Contractor made some adjustments on surface components of pump.
Sones, Ben	302°-3.1 J4-9	1951±	19 (19.30)	7.95 9.43	1961 1965	O	B	Wide variation in water level. Water is muddy and trashy at times.	Quality, water has trash and odor.	Tenant reports that after Event they were unable to drink water because of decrease in water level and odor of and trash in the water. Pre-Event records on this well shows that water level in this tile well has been much lower at times and that the water has periodically been muddy and trashy.
Stinson, W. J.	313°-11.5 M4-3 Marion Co.	---	---	---	---	C	J	---	Quality, colored water.	Water is rusty in appearance. Well contractor believes problem is normal deterioration.
Sumrall, Mrs. Emma	014°-4.4 G19-3	1948	105	93	1948	C	C	Water clear.	Quality, colored water.	Owner's well contractor cleaned out well. Checking a new complaint revealed that previous work was incomplete.
Tarbutton, E.	024°-1.7 J1-2		50±			C	J	Water red in color.	None.	Prospective house buyer wanted a check on the well. We could not investigate well unless owner requested the study.
Taylor, J.	270°-5.7 F12-4 Marion Co.		20± (25.0)	19.20	Dec. 1964	C	J	No iron stain.	Yield, decreased.	Well contractor removed an encrusted screen. This condition plus low water level and use of shallow jet pump resulted in a marginal yielding well. New strainer installed at owner's expense.
Thompson, Clyde	313°-4.6 F29-8	1950	80 (21.32)	9.09 9.24	1961 1964	O	B	Becomes muddy after rain or use. Old well caved in 1964.	Quality, water muddy and has odor.	Large open-tile well. This type of well considered by boards of health as contaminated without even testing.

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Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Thompson, H. G.	199°-4.2 J34-14	1961	100	65	1963	C	C	Water occasionally becomes red in color. Sand in water.	Yield, no water. Quality, sand in water.	No water obtained from well after Event. Well contractor pulled equipment, replaced leathers, and reinstalled. Yield is low, and sand in water. Pre-Event records show marginal water well with problems.
Thompson, H. O.	303°-2.5 J4-5	1954	31	16	1954	C	J	Quality, problem in Dec. 1963.	Yield, decreased.	Water is clear and yield is low. Believe well similar to pre-Event conditions. Probably normal deterioration.
Turner, Jack	271°-10.6 P7-5 Marion Co.	1956 ⁺	17 ⁺	10	1964	C	J	--	Yield, decreased. Quality, water muddy and has odor.	Owner's well contractor recommended a new well. The owner did some work himself. Later, our well contractor pulled the casing. The strainer was greatly corroded and filled with sand and rust. New pipe and strainer was installed at owner's expense. Problem just normal deterioration. Well supplying good quantity of clear water.
Voss, Lavon	083°-8.0 L6-2	--	55 (50.0)	40 38.3	1965 1965	C	J	--	Quality, water muddy and sandy.	Well was checked after the Event for initial complaint of muddy water, and it cleared up in a few days. Later owner reported sand in water. Well contractor removed a corroded strainer. Pipe was pitted. Screen had large openings and peeled easily. New plastic strainer installed at owner's expense.
Ward, R. L.	285°-12.2 L25-1 Marion Co.	1955 ⁺	20 (16.0)	--	--	X	J	--	Yield, no water.	Owner's well contractor said tile curbing had caved in. He removed pump and pipe from the well and installed them in a new 100 ft well. Believe problem to be declining water level or else the new well could have been 20 ft deep like the original well.
Watts, H. E.	074°-8.4 H31-2	1959	185	--	--	C	J	--	Yield, decreased.	Owner reported that yield of well decreased after Event. Well contractor adjusted pressure switch; plenty of clear water now.
Weatherford, D.	029°-9.3 D34-3	1956	45	18	1956	X	J	--	Yield, decreased. Quality, water red in color.	Well yields water which becomes red in color just before well goes dry. Believe normal deterioration and declining water level are the problems here. Well contractor reports that well is almost dry.
Williamson, C. O.	129°-3.4 K29-2	--	65 (52.20)	40 43.53	1961 1965	X	J	Water red in color. Rust stain.	Quality, muddy water.	Owner reported that water became muddy after Event but quickly cleared up. A year later the same complaint was reported. Only 7 ft of water in well. Well contractor lowered jet and bailed the well. However, main problem is well deterioration and declining water level.
Williamson, I.	224°-4.1 J28-4	--	25 (28.4)	23.16 26.58	1961 1965	O	B	Water turns milky after drawing out few bucket loads. Sandy.	Yield, decreased.	Wood curbing of this open well has rotted and crumbled. Well deterioration and declining water level are the problems.
Winslow, Mrs. J.	213°-2.5 J27-6	--	65	--	--	X	J	Construction problems with pipe and wood curbing in 1964.	Yield, decreased. Quality, sand in water.	Well contractor removed pipe and made more perforations. Equipment reinstalled, and water reported to be alright.

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Table 2.--Continued

Name	Location	Year drilled	Depth of well (ft)	Water level		Type of well	Type of lift	Preshot record	Complaint reported	Investigation
				Depth (ft)	Date of measurement					
Worthy, Kirby	278°-12.1 02-1 Marion Co.	1952	651	+0.5	1964	0	F		Yield, decreased.	Owner reported that water ceased flowing. Well contractor jetted a good quantity of water out of the well, thus the strainer is not plugged. Water level is 6-inches above ground level and agrees somewhat with the piezometric surface throughout the area.
Yates, J. C.	267°-8.8 P16-2 Marion Co.	--	1,300?	+1.0	1964	0	F	--	Yield, decreased.	Owner reported that water ceased flowing. Water level about 6 inches above ground level. Well contractor jetted sand and water out of well. Total depth is about 81 ft. Rig moved over the well. Attempted to wash out. Electric log of well indicates that casing is 91 ft deep. New well was drilled, now both wells flow with the water levels about 1-2 ft above ground level.

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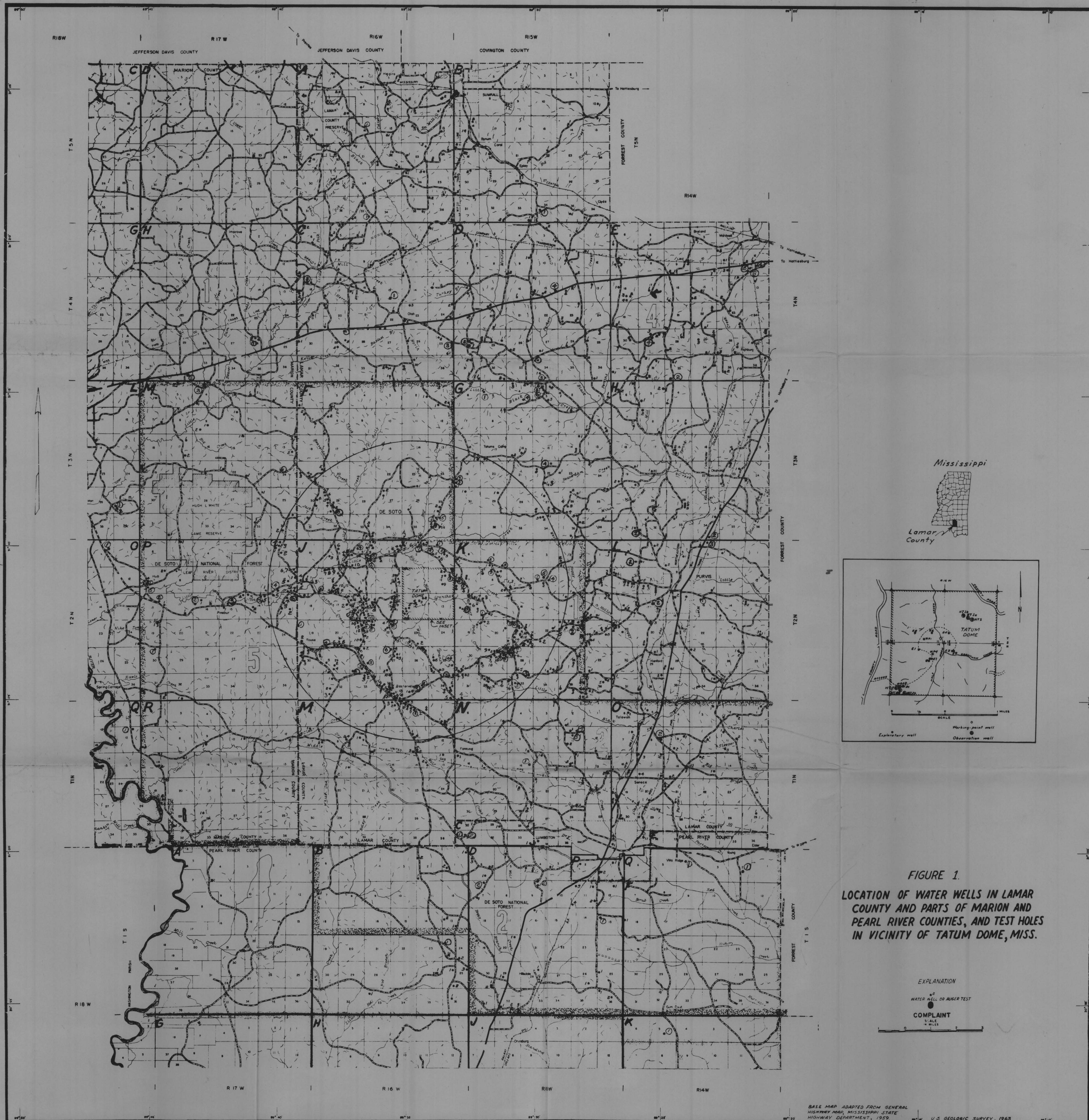


FIGURE 1.
LOCATION OF WATER WELLS IN LAMAR
COUNTY AND PARTS OF MARION AND
PEARL RIVER COUNTIES, AND TEST HOLES
IN VICINITY OF TATUM DOME, MISS.

EXPLANATION

WATER WELL OR AUGER TEST

COMPLAINT

SCALE
0 1 2 3 4 5 6 7 8 9 10 MILES