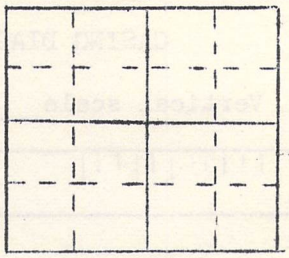
W-4737

IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey

RECORD OF WELL



Location:

Town: McCallsburg (N E) (S W): County Story E

SE NW NE sec. 23 T 85 N., R. 21 W. Twp.

Well name and number McCallsburg Town Well (1951)

Owner Do Address

Tenant Address

Contractor Hoeg & Ames Address

Drillers Ervol Fink

Drilling dates Jan 6 - June 4, 1951

Well data:

Elevations: Drilling curb 1085 feet: Land surface feet

Determined by

Topographic position

Total depth: Reported 1130 feet, Measured feet

Drilling method

Hole and casing data 385' of 8" - +1 - 385'
418' of 6" - 385 - 803'
266' of 5" from 609 - 875'
5" open hole - 875 - 1130 TD

Original depth to water 175 ft. above / below Date

Original elevation of water level ft.; Source of data

Sources of water: Principal ; Others

Production data: Date _____

Static depth to water 175 Measuring point _____
Pumping level 255 ± at 30 g.p.m. _____

Specific capacity _____ g.p.m. per ft. drawdown; Temperature _____ °F.

Pump data: Type pump _____ Column Dia. _____ Length _____
Cylinder or bowls: Dia. _____ Length _____ Suction pipe _____
Power _____ Airline _____
Estimated rate or productions: _____ g.p.m. for _____ hrs. a day
Use of water _____

WATER ANALYSES (in parts per million)

Date samples				
Samples by				
Total solids				
Insoluble matter				
Alkalinity (Meo)				
Alkalinity (Phn)				
pH				
$Fe_2O_3 + Mn_2O_3 + Al_2O_3$				
Alkali as sodium				
Calcium				
Magnesium				
Iron (unfiltered)				
Manganese				
Nitrate				
Fluoride				
Chloride				
Sulfate				
Bicarbonate				
Hardness (ppm)				
Hardness (gpg)				

Remarks _____

Laboratory data: Sample storage location _____

Sample range 0 — 1130 No. spls. 318 No. dupls. & cond. 218-600

Spls. prepared by AJF Washed range 75-1130 by AJF 1/30/51 6/6/51

Driller's log and cond. _____

Insoluble residues: Prepared by _____ Studied by _____ Strip log _____

Microscopic study _____ strip log Spring 1951

Gen. log _____ Correl. by GEO. HUNTINGTON

Results of Pumping Test on McCallsburg Town Well
June 4, 1951

Name: McCallsburg Town Well (1951)

Location: SE¼ NW¼ NE¼ sec. 22, T. 85 N., R. 22 W., Story County

Elevation: 1085 feet above sea level datum

Total depth: 1130 feet

Casing and hole data: 385' of 8" from +1 to 385'
418' of 6" from 385' to 803'
266' of 5" from 609' to 875'
255' of 5" open hole from 875' to 1130' TD

Contractor: Hoeg & Ames, Lincoln, Iowa

Driller: Ervol Fink

Drilling dates: January 6 to June 4, 1951

Pump data: Turbine, belt-driven with tractor. 3½" pump column with 5" bowls. 235' to bottom of bowls with 30' of suction pipe below bowls.

Discharge measurements: Discharge rate measured by checking time required to fill 55-gallon barrel

Temperature measurements: Temperature of the water was measured by thermometer at discharge end of 50' of fire hose from pump

Depth-to-water measurements: The depth-to-water during pumping could not be measured with electric line. The water level during pumping was below the pump bowls and the electrode on end of line would not pass between bowls and casing.

McCallsburg Town Well, June 4, 1951

Time	D/W	GPM	Temp.	Remarks
8:00 am				Started pumping.
				Observation by driller: 35 gpm. SWL 175'.
9:00				Observation by Geological Survey: W/L in bowls. Cannot measure with electric line.
9:15			55.5	Water clear from 8:00 to 9:15, then cloudy.
9:25		30		Water very cloudy; odor.
9:43				Water cloudy.
10:00				Water cloudy.
10:30			57	Water slightly cloudy.
10:55		30		Water slightly cloudy; odor.
11:10			57	Water fairly clear.
11:30			57	
11:35			57	
1:15 p.m.		30		
2:30			57.5	
2:45		30		Water slightly cloudy.
3:40			57.5	
5:00			57.5	
5:30			57.5	Water sample.
6:00		30		
6:10				Pump off.
6:20	181.5			Recovery measurements.
6:25	180.6			
6:27	180.0			
6:33	179.0			
6:45	177.9			
6:50	177.5			
June 5				
8:30 a.m.	170.2			

Story

March 14, 1951

Mr. H. V. Pedersen
Marshalltown Water Works
Municipal Building
Marshalltown, Iowa

Dear Mr. Pedersen:

We were surprised and disappointed to learn from your letter of March 13 to Dr. Hershey that no water was encountered in the limestone and dolomite of Mississippian age in the well being drilled at McCallsburg. The report that shale was encountered at a depth of 600 feet, at a somewhat shallower depth than we would have anticipated. From an examination of samples from the well it seemed possible that dolomites of Mississippian age would occur to a depth of between 625 and 650 feet. I presume, however, that several feet of shale were drilled which would indicate that the Maple Mill shale, underlying the limestone and dolomite strata, had been reached.

The geologic section below the top of the Maple Mill shale to the top of the Maquoketa shale is estimated as follows:

Formation and Description	Thickness (ft.)	Depth (ft.) From	Depth (ft.) To
Mississippian system			actually 635
Maple Mill formation (shale)	50	600 635	650 685
Devonian system		685	705
Sheffield formation (dolomite)	20	650	670
(shale)	25	670 705	695 730
Lime Creek formation (limestone with some dolomite and shale beds)	80	730 695	810 775
Shell Rock formation (dolomite and shale)	70	810 775	880 845
Cedar Valley formation (limestone and dolomite with gypsum in lower part)	300	880 845	1180 1145
Wapsipinicon formation (dolomite and gypsum)	85	1145	1230
Undifferentiated dolomite and chert	100	1230	1330

Ordovician system

Maquoketa formation (shale) 1330

A few well records and water samples indicate that some water of fair quality might occur in the Lime Creek formation and in the upper part of the Cedar Valley formation in the vicinity of McCallsburg. A well finished at the top of the Shell Rock formation at the Story County Home northeast of Nevada developed a supply of 55 gallons a minute with a reported drawdown of 40 feet. A part of the supply was probably obtained from water-bearing beds within the limestone and dolomite of Mississippian age. The Creamery well at Nevada would yield a supply of about 20 gallons a minute with a drawdown of 150 feet when the well had penetrated most of the Cedar Valley formation. To the north of McCallsburg near New Providence, a well drilled for the White Institute farm unit through the Cedar Valley formation and into the Wapsipinicon formation is reported to have developed a supply of 56 gallons a minute with a drawdown of 35 feet. Analyses of the water from the Story County Home and the White Institute wells is attached.

At McCallsburg, water encountered in the lower part of the Cedar Valley formation and the underlying beds to the top of the Maquoketa formation is likely to be highly mineralized because of the presence of gypsum in these strata. The town well at Melbourne to the southeast of McCallsburg, finished at the top of the Maquoketa formation, develops water with a hardness of about 1700 parts per million.

In summary, some water of fair quality may be encountered in the interval between 700 and 900 feet at McCallsburg but there is no certainty that an adequate supply can be developed. More water may be expected to occur between 900 feet and the top of the Maquoketa formation, but the water may be highly mineralized.

If no further drilling is to be done, some consideration might be given to developing the well at its present depth. Acidising the well does not look promising inasmuch as some cracks and pores must be present to allow the acid to enlarge the water passages. Shooting limestone has not been particularly satisfactory, but heavy shooting of selected zones might yield some results. The charges might be placed on a bridge and a load placed on top of the charge to increase the lateral effect of the shot. The lower 100 feet of hole appears to be the most favorable for treatment.

We will be interested to learn of further development on this project. If you have any comments or suggestions to make in regard to this discussion or if we can be of additional assistance to you, please do not hesitate to let us know.

Very truly yours,

William E. Hale

WEH:emh

IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSES COUNTY _____
(Dissolved constituents in parts per million)

TOWN - Well No. Use - Location	Date of coll.	Depth (ft.)	Geol. source	°F.	Diss. solids	Fe	Mn	Ca	Mg	Na+K(as Na)	HCO_3	SO_4	Cl	F	NO_3	Hardness (calc. as $CaCO_3$) Tot.	Carb.	Non-carb.	pH	Cond.
Story County Home	1/3/45	764	Dev.		601	2.4	0	130	42	17	408	169	5.0	2.2	0	498	334	164	7.2	
*White Institute Farm	8/7/42	832	Dev.	53	240	1.1	0	54	19	33	298	21	3.0	2.0	0	213	213	0	7.6	

NOTES: *Water sample collected from off pressure tank. Temperature of water and Iron content may not be representative of water direct from well.

MAR 14 '51

H. V. PEDERSEN
SUPT. AND MGR.

MARSHALLTOWN WATER WORKS

MUNICIPAL BUILDING
MARSHALLTOWN, IOWA

March 13, 1951

Mr. H. Garland Hershey
Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Dear Mr. Hershey:

I just received a phone call from Hoeg and Ames, well drillers, telling me they had put a hole down at Mc Callsburg a depth of 600 feet or into the shale below the Mississippin formation and the hole is absolutely dry. This was terrible news and, of course, leaves us all in a quandry. (quandary)

If the town council should decide to drill deeper, what is the next formation and approximate depth they could expect to encounter water? Apparently the geology in and around Mc Callsburg is such that the water which is normally found in the Mississippin formation either drains away or never enters the formation. Therefore we might expect the lower formations to vary from the normal.

The town naturally will want to try everything within reason and within their means to obtain a well. They could afford to spend between $2000.00 and $3000.00 more in the same hole if results would justify it. There is no need of trying for a new well anywhere within the town limits. We could go a mile or two west or north and get a well, but the cost of laying the feeder main would be prohibitive. Will you please give this problem some thought and let me know as soon as possible what you would do if you were a member of the town council?

Very sincerely yours,

HV Pedersen.

H. V. Pedersen

HVP:c

Story

March 21, 1951

Mr. S. R. Ames
Lincoln, Iowa

Dear Mr. Ames:

We have completed the examination of the cuttings from the McCallsburg town well to a depth of 650 feet. The top of the Maple Mill shale appears to have been encountered at a depth of about 635 feet.

The lower 100 feet of dolomite belonging to the Hampton formation and occurring between a depth of 535 and 635 feet is finely porous. This does not indicate that this section is permeable but it does suggest that this interval might be more successfully treated by shooting or acidizing than other strata open to the hole.

We will appreciate learning of developments in regard to this well and if we can be of further assistance to you on this project, please let us know.

Very truly yours,

H. G. Hershey

HGH:VEH:emh

Gilmore City formation (limestone, oolitic in part)	20	405	425
Hampton formation (dolomite and limestone, some chert)	80	425	505
Maple Mill (?) shale	50	505	555
Dolomite	20	555	575
Devonian system			
Sheffield shale	20	575	595
Lime Creek formation (limestone, shale, and dolomite)	80	595	675
Shell Rock formation (dolomite and shale)	70	675	745
Cedar Valley formation (dolomite and limestone, gypsiferous in lower part)	295	745	1040
Wapsipinicon formation (dolomite, gypsiferous)	100	1040	1140
Silurian system			
Undifferentiated chert and dolomite	90	1140	1230
Ordovician system			
Maquoketa shale		1230	

Any variation between the assumed and actual surface altitude at the well will modify all these depth figures accordingly.

The driller's log to a depth of 290 feet as furnished by Mr. Fink indicates that you are drilling in Pennsylvanian strata. The top of the Mississippian limestone probably will lie a short distance below. Unless a water-bearing bed of sandstone occurs, the Pennsylvanian rocks are unlikely to yield much water. From 300 feet to the top of the Maple Mill (?) shale the Mississippian formations consist largely of limestone and dolomite beds containing minor amounts of chert. This section should be about 205 feet thick. Several successful wells have been completed in these rocks in the surrounding area. Roland, Story City, and Ellsworth reported yields ranging from 100 to more than 600 gallons a minute from Mississippian strata. In other places Mississippian wells have yielded from 5 to 40 gallons a minute. The Roland well produced 240 gallons a minute with a drawdown of 4 1/3 feet. The static water level was listed as 28 1/3 feet. It is generally necessary to drill for a considerable distance into the

limestones to obtain an appreciable supply of water, although in some places the St. Louis-Warsaw beds yield small quantities. Most Mississippian wells are cased through the Warsaw shale and several through the upper part of the Keokuk-Burlington limestones where a thick bed of shale has been noted to occur. Mineral analyses of water from a few representative Mississippian wells are attached to this report. These analyses show the water to be of fair quality and to have a hardness of about 400 parts per million. The fluoride content is moderately high in these waters.

Below the base of the Hampton limestone occur two beds of shale separated by a thin dolomite having an aggregate thickness of about 90 feet. These strata are not expected to contain appreciable amounts of water and probably will have to be cased to prevent caving into the hole.

Most wells in this part of the state obtain enough water from the rocks above the Maple Mill (?) shale so that deeper drilling is seldom necessary. We find few wells extending into the Devonian strata. The Devonian rocks comprise several hundred feet of dolomite and limestone beds with a few shale layers in the upper formations and gypsum in the lower formations. This section doubtless will have at least one or two water-bearing zones. The chief deterrent to developing a well in the Devonian rocks is that the water is usually of much poorer quality than that from the Mississippian strata. The Story County Home well was completed in the Lime Creek formation at a total depth of 765 feet. In 1943 this well was tested for 10 minutes at 125± gallons a minute. At the time of completion in 1941 the driller reported a yield of 55 gallons a minute with 40 feet of drawdown. The static water level was given as 97 feet. Analysis of the water from this well is attached.

Large additional water supplies should occur in the Ordovician and Cambrian formations at much greater depths, and we shall be glad to furnish you with what information we have on the deep aquifers if you so desire.

We will be very interested to hear of further developments on the McCallsburg project and will be glad to examine samples and report your position in the geologic section to you. If you have any questions on this material or if we can be of additional assistance in any way, please write or call us.

Very truly yours,

H. G. Hershey

HGH:PJH:emh

IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSES
(Dissolved constituents in parts per million)

COUNTY _____

TOWN - Well No. Use - Location	Date of coll.	Depth (ft.)	Geol. source	°F.	Diss. solids	Fe	Mn	Ca	Mg	Na+K(as Na)	HCO_3	SO_4	Cl	F	NO_3	Hardness (calc. as $CaCO_3$) Tot.	Carb.	Non-carb.	pH	Micro-mhos at 25°C Cond.
Roland Town Well(1944)	4/12/50	238	Miss. Gil.City		417	3.5	0.1	98	37	18	403	54	15	1.5	1.8	397	330	67	7.5	703
Story City Well No.2	10/30/45	261.3	Miss.	50	400	0.05	0.0	90	33	22	478	3.9	3.0	1.9	0.0	361	361	0	7.3	710
Ellsworth Town (1948)	12/17/48	365	Miss.		433	3.	0.0	65	24	48	429	3.9	2.	1.2	0.0	261	-	-	7.5	639
Milford Cons. School No. 2 (Nevada)	10/14/47	435	Miss.	53	536	1.0	0.0	105	37	34	433	121	1.5	2.0	0.53	415	355	60	7.6	795
Story County Home (Nevada)	1/3/45	764	Dev.		601	2.4	0.0	130	42	17	408	169	5.0	2.2	0.0	498	334	164	7.2	
Huxley Town Well	2/17/39	992	Dev.(?)		1243	0.1	0.2	148	27	222	225	716	5.0	1.0	22	481	184	297	6.9	

NOTES:

JAN 21 1951

HOEG & AMES

WATER SYSTEMS — WELL CONTRACTORS — WELL SUPPLIES

LINCOLN, IOWA

January 20, 1951

Dr. H. G. Hershey

State Geological Survey

Iowa City, Iowa

Dear Sir,

We are drilling a well for the Town of McCallsburg and would like very much to have a forecast, as to formations, casing points and the possibilities of water.

Ervol Fink is drilling this well and is saving samples. His log is as follows, as it may help you in your forecast:

Drift	0-149 Ft.
Sandstone	149-161 ft.
Shale	161-221 ft.
Rock	221-226 ft.
Shale	226-290 ft.

Awaiting an early reply, I remain.

Yours very truly,

S. R. Ames

S. R Ames

SRA:HCS

April 23, 1952

Mr. Carroll Lura
McCallsburg, Iowa

Dear Mr. Lura:

We have completed the examination of well cuttings from the 1,085-foot McCallsburg well.

A copy of our geologic log is being sent to you under separate cover.

Very truly yours,

H. G. Hershey

HGH:emh

July 11, 1951

Mr. Carroll Lura
McCallsburg, Iowa

Dear Mr. Lure:

Enclosed is a report on the mineral analysis of water from the 1130-foot well at McCallsburg as shown by a sample collected by Mr. James B. Cooper on June 4, 1951.

This report does not show the sanitary condition of the well since it is impossible to make a bacteria count from a sample such as the one collected.

If you have any questions concerning this report, please do not hesitate to let me hear from you.

Very truly yours,

H. G. Hershey

Enclosure

HGH:emh

July 11, 1951

Hoeg and Ames
Lincoln, Iowa

Gentlemen:

Enclosed is a report on the mineral analysis of water from the 1130-foot well at McCallsburg as shown by a sample collected by Mr. James B. Cooper on June 4, 1951.

If you have any questions concerning this report, please do not hesitate to let me hear from you.

Very truly yours,

H. G. Hershey

Enclosure

HGH:emh

July 11, 1951

Mr. H. V. Pedersen
Marshalltown Water Works
Municipal Building
Marshalltown, Iowa

Dear Mr. Pedersen:

Enclosed is a report on the mineral analysis of water from the 1130-foot well at McCallsburg as shown by a sample collected by Mr. James B. Cooper on June 4, 1951.

If you have any questions concerning this report, please do not hesitate to let me hear from you.

Very truly yours,

H. G. Hershey

Enclosure

HGH:emh

McCallsburg (Story)

IOWA PRESS
CLIPPING BUREAU
Des Moines, Iowa

Morning Register
Des Moines, Iowa

JUN 22 1951

OFFICIAL PUBLICATION.

NOTICE OF PUBLIC HEARING ON PLANS, SPECIFICATIONS AND FORM OF CONTRACT FOR A CONSTRUCTION OF A WATERWORKS DISTRIBUTION SYSTEM AND A COMPLETE PUMPING AND PRESSURE TANK SYSTEM OR AN ELEVATED TANK AS AN ALTERNATE, AND FOR THE CONSTRUCTION OF A TANK AND PUMP HOUSE, FOR THE TOWN OF McCALLSBURG, IOWA, FIXING A TIME FOR HEARING THEREON AND OBJECTIONS THERETO, AND FOR NOTICE TO BIDDERS.

Notice is hereby given that the Council of the Town of McCallsburg, Story County, Iowa, will meet at its regular meeting place in the Town Hall on the 18th day of July, 1951, at 7:30 o'clock p. m. at which time and place it will hold a public hearing for the adoption of and the consideration of objections to the proposed plans, specifications and form of contract for a public improvement consisting generally of the following as hereinafter set forth. The improvement is divided into three sections according to the nature of the work.

SECTION A.

Section A, Plan 1, consists of furnishing the materials and constructing approximately 12,736 feet of cast iron water mains consisting of approximately 80 feet of 6 inch pipe, 4,380 feet of 4 inch pipe and 8,276 feet of 2 inch pipe, together with the necessary fittings, valves, hydrants, valve boxes, joint materials and other materials as called for by the plans and specifications.

Section A, Plan 2, is identical with the above Plan 1, except that if transit or cement-asbestos pipe is used, it shall consist of approximately 80 feet of 6 inch pipe and approximately 12,656 feet of 4 inch pipe.

SECTION B.

Section B consists of furnishing and installing a 30 G.P.M. deep well pump and either a 9,052 gallon air pressure tank or a 10,000 gallon elevated tank as an alternate, together with all connecting pipes, valves, fittings and etc. and all electrical appurtenances, automatic controls, wiring, conduits, switches, relays, etc., and all tank accessories, such as water column and water level glass, pressure gauge, air volume pressure control, and air compressor, if a pressure tank is installed and all other things necessary for a complete pumping and pressure tank system as provided by the plans and specifications.

SECTION C.

Section C consists of furnishing the materials and constructing either a combination pressure tank and pump house attached to the present building with the required foundation, fittings for tank, tank supports, floor, pump base, all windows, doors and other appurtenances according to the plans and specifications if a pressure tank is installed, or a small insulated pump house, if an elevated tank is installed, all according to the engineer's plans and specifications.

That the plans, specifications and form of contract are now on file in the office of the Town Clerk and reference is made to each section of the work as is set forth therein and as therein provided.

NOTICE TO BIDDERS.

That on the same date and at the same place immediately upon conclusion of the hearing referred to herein, the council of said town will remain in session and consider bids filed with the Town Clerk on or before 7:30 o'clock p. m. on said date for each separate section of the work provided for in said plans, specifications and form of contract.

That the plans, specifications, instructions to bidders and form of contract will by reference be incorporated into and made a part of each contract awarded and the successful bidders on each section of the work as is herein set forth will be held to a strict compliance to all such plans, specifications and instructions to bidders and the terms and conditions of the contracts awarded.

Contractors may bid on one or more sections of the work but the contracts will be awarded separately on the separate sections of the projects as follows:

SECTION A.

Section A, Plan 1, consists of furnishing the materials and constructing approximately 12,736 feet of cast iron water mains consisting of approximately 80 feet of 6 inch pipe, 4,380 feet of 4 inch pipe and 8,276 feet of 2 inch pipe, together with the necessary fittings, valves, hydrants, valve boxes, joint materials and other materials as called for by the plans and specifications.

Section A, Plan 2, is identical with the above plan 1, except that if transit or cement-asbestos pipe is used, it shall consist of approximately 80 feet of 6 inch pipe and approximately 12,656 feet of 4 inch pipe.

IOWA PRESS
CLIPPING BUREAU
Des Moines, Iowa

Journal
Nevada, Iowa

JUN 7 1951

McCallsburg Well Under Construction

McCALLSBURG — Contractors Hoeg and Ames of Lincoln, Iowa have completed the drilling of a new well at McCallsburg at a depth of the well disclosed 30 and 35 gallons per minute at a 245 level.

A representative of the geologist department at Iowa City was in McCallsburg to make an alaysis of the water. On Monday H. V. Peterson of Marshalltown, engineer, was in McCallsburg for a check on the well. He will return later to discuss with the city council specifications for the distribution system.

The casing of the well will be as follows: 385 feet of 8 inch casing; 418 feet of 6-inch casing and 265 feet of 5-inch casing.

Story

June 19, 1951

Mr. H. V. Pedersen
Marshalltown Water Works
Municipal Building
Marshalltown, Iowa

Dear Mr. Pedersen:

Attached for your information are the results of the pumping test made on June 4 on the McCallsburg town well.

If you have any questions concerning this test, please do not hesitate to contact us.

Very truly yours,

William E. Hale

Enclosure

WEH:emh

Story

June 19, 1951

Mr. Carroll Lura
McCallsburg, Iowa

Dear Mr. Lura:

Attached for your information are the results of the pumping test made on June 4 on the McCallsburg town well.

If you have any questions concerning this test, please do not hesitate to contact us.

Very truly yours,

William E. Hale

Enclosure

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June 19, 1951

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Lincoln, Iowa

Gentlemen:

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If you have any questions concerning this test, please do not hesitate to contact us.

Very truly yours,

William E. Hale

Enclosure

WEH:emh

SECTION B

Section B consists of furnishing and installing a 30 G. P. M. deep well pump and either a 9,052 gallon air pressure tank or a 10,000 gallon elevated tank as an alternate, together with all connecting pipes, valves, fittings and etc. and all electrical appurtenances, automatic controls, wiring, conduits, switches, relays, etc., and all tank accessories, such as water column and water level glass, pressure gauge, air volume pressure control, and air compressor, if a pressure tank is installed and all other things necessary for a complete pumping and pressure tank system as provided by the plans and specifications.

SECTION C.

Section C consists of furnishing the materials and constructing either a combination pressure tank and pump house attached to the present building with the required foundation, fittings for tank, tank supports, floor, pump base, all windows, doors and other appurtenances according to the plans and specifications if a pressure tank is installed, or a small insulated pump house, if an elevated tank is installed, all according to the engineer's plans and specifications.

The contractor bidding on any section or combination of sections, shall give bond in a sum equal to the contract price of such section or combination of sections, obligating the contractor and his bondsmen to the faithful performance of the contracts and to guarantee the materials used and workmanship for a period of one year from date of acceptance by the town and to punctually pay all laborers employed on said work and for all materials furnished under each section or combination of sections.

The contractor bidding on any section or combination of sections, shall give bond in a sum equal to the contract price of such section or combination of sections, obligating the contractor and his bondsmen to the faithful performance of the contracts and to guarantee the materials used and workmanship for a period of one year from date of acceptance by the town and to punctually pay all laborers employed on said work and for all materials furnished under each section or combination of sections.

Copies of the plans, specifications and instructions to bidders are on file with the Town Clerk, McCallsburg, Iowa and with the engineer, H. V. Pedersen, Marshalltown, Iowa, and may be obtained upon depositing the sum of $10.00 which deposit will be returned to all unsuccessful bidders upon return of such plans in good condition, but which will be subject to forfeiture in the event no bid is submitted.

Contracts will be awarded on each section of the improvement to the lowest responsible bidder as determined by the Council upon recommendation of the engineer, that the equipment and materials to be furnished meet the plans and specifications call for. The Town reserves the right to reject any and all bids and to enter into such contracts as it may deem to be for the best interest of said town, or to readvertise if all bids are rejected.

Work will be commenced upon the separate sections of the improvement and completed according, as is provided in the instructions to bidders.

All proposals for each separate section of the work herein contemplated will be made on blank forms furnished by the Town of McCallsburg, Iowa, and shall be accompanied in a separate envelope by a certified check in the amount of 5% of the total bid as a guarantee that the bidder, if successful, will enter into a contract with the said Town for the instalation of the work for which the contract is let and which check shall be subject to forfeiture as agreed liquidated damages in default of the contractor if he fails to enter into the contract for which his proposal is accepted.

By virtue of statutory authority, a preference will be given to products and provisions grown within the State of Iowa and preference shall be given to Iowa domestic labor in accordance with Chapter 73, Code of Iowa for 1950.

Payment on the contracts under Sections B and C will be made in full to the Contractor in cash from the proceeds of the sale of $24,000.00 General Obligation Bonds of said town and payment under Section A of said improvement will be made partly in cash from the proceeds of the sale of said General Obligation Bonds and partly in cash from the sale of $16,000.00 Waterworks Revenue Bonds of the Town of McCallsburg, Iowa, or by delivery of said Waterworks Revenue Bonds to the contractor. Payments will be made upon completion, inspection and acceptance of the improvement by the said Town, or in the event of unforeseen events that delay the completion of the work, the Council at its discretion, may authorize payment upon invoices of materials on the ground or work completed upon recommendation of the engineer, not to exceed 90% thereof.

All bids will be opened by the Council in open Council meeting at the time above fixed and contracts awarded at that time or at such subsequent time to which the Council may adjourn.

Published by order of the Council of the Town of McCallsburg, Iowa.

Gerald Vallem,
CLERK, Town of McCallsburg, Iowa.

June 13, 1950

Mr. H. V. Pedersen
Marshalltown Water Works
Municipal Building
Marshalltown, Iowa

Dear Mr. Pedersen:

In response to your letter of June 7 regarding the ground-water conditions at McCallsburg, Iowa, the following brief summary has been compiled from the open files of the Geological Survey.

Assuming a location in the town and a starting altitude of about 1,090 feet above sea level, the geologic section to be expected is as follows:

Formation	Thickness (feet)	From (feet)	To (feet)
Pleistocene System (pebbly clay with local sand and gravel)	150±	0 -	150±
Pennsylvanian System (shale with thin beds of sandstone and coal)	110±	150 -	260±
Mississippian System			
St. Louis formation (limestone and sandstone)	20	260 -	280
Keokuk-Burlington formations (limestone and dolomite, cherty in part)	110	280 -	390
Gilmore City formation (limestone and oolitic limestone)	60	390 -	450
Hampton formation (dolomite and limestone, cherty in part)	100	450 -	550
Maple Mill shale	---	550 -	---

Inasmuch as we have no records of moderately deep wells at McCallsburg, the thickness of the glacial deposits and the Pennsylvanian rocks is approximate only. A better estimate of the depth to the Gilmore City formation would be possible by examination of the well cuttings as the well is being drilled.

The Pleistocene in this area seems to consist mainly of clay, but some sand and gravel may occur within the drift or more especially at the base. The municipal supply of Zearing and formerly that at Story City is obtained from gravels at a depth of 60 to 100 feet. Possibly a sufficient thickness of gravel may be encountered at McCallsburg. If it is decided to try to obtain water from shallow depths, however, an adequate testing and pumping program should be set up to determine the location, and perennial yield of the water-bearing gravel before determining the site for a final well.

The Pennsylvanian beds below the drift comprise shale containing a few thin beds of fine sandstone. These sandstones seem to supply some domestic and stock wells locally, but the yield probably would be inadequate for a municipal supply.

The Mississippian rocks below the Pleistocene and Pennsylvanian beds are largely limestone and cherty dolomite in the upper part and shale below. Inasmuch as our records indicate that municipal wells in this part of Story County penetrate the Mississippian to the Gilmore City or Hampton formations, it seems probable that only minor amounts of water are available in the uppermost Mississippian beds. Wells that penetrate the Gilmore City oolitic limestone, however, yield moderate to large supplies of water. The Story City well No. 2 was tested at 647 gallons a minute with a drawdown of 26.5 feet, the Story City well No. 1 at 200 gallons a minute with a 12-foot drawdonw, and the Roland town well No. 4 at 240 gallons a minute with a drawdown of 10.7 feet. The yield of this formation at McCallsburg may be less than at the wells to the west, but it should be adequate.

The mineral quality of the water from the gravels at Zearing and Story City and from the Mississippian limestone, chiefly the Gilmore City formation, are given on the attached sheet.

If there are any questions about these comments or if we may be of other service, please let us hear from you.

Very truly yours,

R. M. Jeffords

RMJ: GES

REPRESENTATIVE WATER ANALYSES

(Dissolved constituents in ppm.)

Location	Depth (ft.)	Geol. Source	Diss. Solids	Fe	Mn	Ca	Mg	Na	HCO_3	SO_4	Cl	F	NO_3	Hardness as $CaCO_3$			pH
														Tot.	Carb	Non Carb	
Zearing	90	Pleist. Gravel	430	5.1	0	57	18	79	471	3.1	2	.6	0	216	216	0	7.4
Story City	137	"	358	2.0	.0	80	32	20	417	.7	3.0	1.5	.89	332	332	0	7.8
Story City #2	261	Miss.	400	.05	.0	90	33	22	478	3.9	3.0	1.9	.0	361	361	0	7.3
Roland	238	"	417	3.5	.1	98	37	18	403	54	15	1.5	1.8	397	330	67	7.5
Roland	251	"	430	.4	.0	101	34	4.9	403	47	10.0	2.0	2.2	392	330	62	6.8

TRUSTEES
A. R. COOPER, CHAIRMAN
J. W. PATTIE
W. A. LANE

H. V. PEDERSEN
SUPT. AND MGR.

MARSHALLTOWN WATER WORKS

MUNICIPAL BUILDING
MARSHALLTOWN, IOWA

June 7, 1950

Mr. H. G. Hersey
Iowa State Geological Survey
Geological Annex
Iowa City, Iowa

Dear Mr. Hersey:

The town of Mc Callsburg, Story County, Iowa is interested in the installation of a complete water works system and have asked me to make a report and tentative estimate of cost in order to start the ball rolling.

Will you please send me available data regarding water bearing formations for this area? In checking over data that I have, we find that Zearing, a town 4 miles east of Mc Callsburg has a very good well. Story City to the west also has a good well. It would be logical to assume that Mc Callsburg in between these two towns would have no difficulty, but I learned that the wells there do not bear this out. One well 200 feet deep is not producing enough water to be considered satisfactory for public use. Reports are that the sand at that depth is also very fine and of poor quality. Most of the shallow wells owned by residents are not satisfactory. The council talked of a deeper well and I guess several well drillers have also talked likewise.

Will you therefore please give me your opinion as to the best possible source and the best type of well you believe will produce the best results?

Very truly yours,

H V Pedersen

H. V. Pedersen

HVP:c

IOWA GEOLOGICAL SURVEY
Iowa City, Iowa

Well Log Record

Well name and number McCallsburg Town Well Town McCallsburg County Story

Owner of well Town of McCallsburg Address McCallsburg

Tenant — Address —

Location SE NW NE sec. 22, T. 85 N., R. 22 E. W. — Twp.

Curb elevation 1085 ft. Present depth — ft. final depth 1130 ft.

Static level: (Depth to water above/below curb) 175 ft. Pumping level 255 ± ft. at 30 g.m.

Contractor Hoes & Ames Date drilled Jan-6-June 4-5'
Ervel Fink

Description*	FEET Thick	From	To	Description*	FEET Thick	From	To
Blue Clay		0	10	Grey Shale		280	380
Yell clay		10	75	Rx. & few sh. bands		380	635
Var. Shale		75	149	Shale		635	695
Wht. Ls.		149	160	Gray Ls.		695	720
Blk. Shale		160	177	Rx. & Shale		720	750
Rx. & Sh.		177	221	Shale		750	770
Wht. Ss.		221	240	Rx. & Shale		770	875
Shale		240	244	Grey Ls.		875	1130
Gray SS		244	255				
Blk. Shale		255	280				

*Abbreviate descriptions: use one line for each formation

Remarks on water zones and casings 41' of 385' & 8" from 0' to 385'
bottom 15' some sypt brown Ls. 418' of 6" from 385' to 803'
266' of 5" from 609' to 875'
(244' & 10" to be pulled.) 255' & 5" open hole 875 to 1130

Temperature: Air ____ °F., Water ____ °F. at A.M. P.M. ____ 19__

Record obtained from Ervel Fink Recorded by JBC

9-230

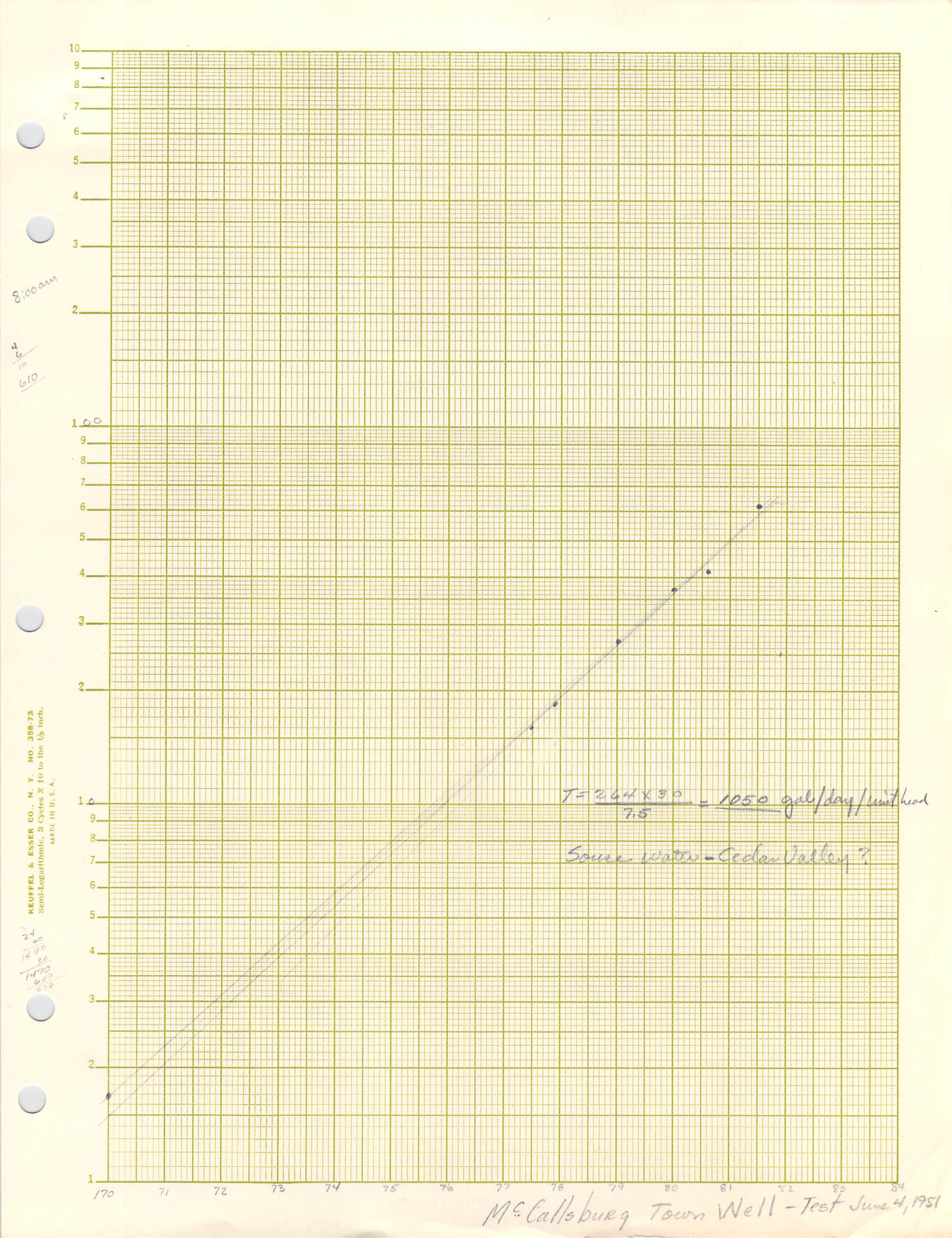
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington ____ / District ____

GPO 6—9333

McCallsburg – Res. Test – June 5-51 JBC-RC

Time	Read X10	Temp.	Rmks	Time	Read X10	Temp	Rmks	Time	Read X10	Temp.	Rmks	
9:23A	Pump ON			9:54	410	55	fairly clear	10:25	400	56	Cloudy	
24	320		Cloudy	55	410	"	"	26	400	56.5	"	
25	320	53	Rusty	56	410	"	"	27	400	"	"	
26	390		do	57	410	"	"	28	400	"	"	
27	410	52.5	Clearing	58	410	"	"	29	400	"	"	
28	440	53	"	59	410	"	"	30	400	"	"	
29	420	54	"	10:00A	410	"	"	31	400	"	"	
30	420	54	"	01	410	"	"	32	400	"	"	
31	420	54	"	02	410	"	"	33	400	"	"	
32	420	54	"	03	410	"	"	34	400	57	less Cloudy	
33	420	54	"	04	410	55.5	"	35	400	"	"	
34	410	54.5	"	05	410	"	"	36	400	"	"	
35	410	54.5	"	06	410	"	"	37	400	"	fairly Clear	
36	410	"	"	07	410	"	"	38	400	"	"	
37	400	55	"	08	410	"	"	39	400	"	"	
38	400	"	"	09	410	"	V. Slty Cloudy	40	400	"	"	
39	400	"	"	10	400	56	"	45	400	"	"	306PM
40	400	"	"	11	400	"	Cloudy	50	400	"	"	
41	400	"	"	12	400	"	"	55	400	"	"	
42	400	"	"	13	400	"	"	11:00	400	"	"	
43	430	"	"	14	400	"	"	05	400	"	"	
44	410	"	"	15	400	"	"	23	400	"	Clear	
45	410	"	"	16	400	"	"	25		Pump off		
46	410	"	"	17	400	"	"					
47	410	"	"	18	400	"	"					
48	410	"	"	19	400	"	"					
49	410	"	"	20	400	"	very Cloudy					
50	410	"	"	21	400	"	"					
51	410	"	"	22	400	"	"					
52	410	"	"	23	400	"	"					
53	410	"	"	24	400	"	"					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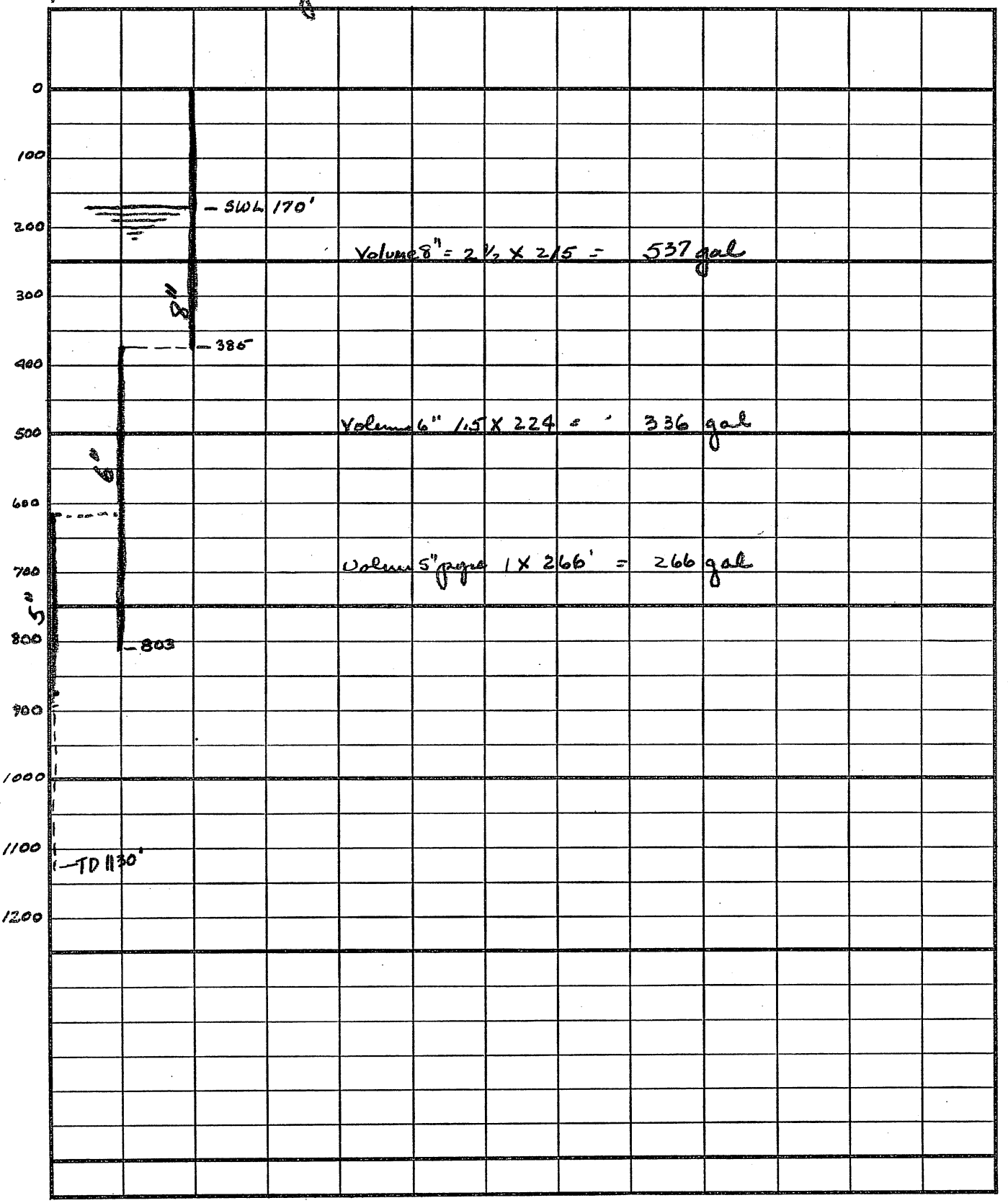
84
8:00 am
KEUFFEL & ESSER CO., N. Y. NO. 358-73
Semi-Logarithmic, 3 Cycles X 10 to the ½ inch.
MADE IN U.S.A.
T = 244 x 30 / 7.5 = 1050 gal/day/unit head
Soure water - Cedar Valley ?
McCallsburg Town Well - Test June 4, 1951

9-230

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington ____
District ____

McCallsburg Town Well



U. S. GOVERNMENT PRINTING OFFICE 16—48721-1

9-230

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington ____ / District ____

GPO 6—9333

Mc Callsburg Town well — June 4–5

Time 6	D/W 5	Gpm 3	Temp 4		Rgp.			Remarks.
8:00A								Started Pumping
								35 gpm.
								SWL 175'
9:00								W/a in bowls. - Cannot
								measure with chalk line.
9:15			55.5					Water clear from 8:00
								to 9:15 then Cloudy.
9:25		30			3900			Water very Cloudy - odor
9:43					4000			" Cloudy
11:00					4000			" "
10:30			57		4000			Water Slightly Cloudy
10:55		30						" " " odor
11:10			57		4000			Water fairly clear.
11:30			57					Heater
11:35			57		4000			
1:15P		30						
2:30			57.5		4000			
2:45		30						water slightly Cloudy
3:40			57.5		4000			Cleaned cell in Pit Heater before
5:00			57.5		4000			reading
5:30			57.5					Water Sample
6:00		30						
6:10								Pump off
6:20	181.5					-	Recovery	- measuring with H & A Tester
6:25	180.6							
6:27	180.0							
6:33	179.0							
6:45	177.9							
6:50	177.5							
June 5								
8:30A	170.2							

3½" Column
5" bores.
235' to bot of bores
30' of Suction.

50' of Friction
air Temp 55°

June 5 - 51

Bill:

Enclosed are the data from McCallsburg — There doesn't seem to be much startling information. The drillers are tearing down today and moving off this week.

JUN -6 '51

Peterson at Marshalltown wants copies of these records & complete mineral analysis. Am leaving H2O Sample with Cahill.

The town wants a colored log of the well.

(Carroll Lura
McCallsburg, Iowa)

Tim

McCallsburg

Jim:

About all I organized on this was the water sample data sheet

Cond-63.1

Vers.-Hdness -352 ppm

Ralph said Hoag and Ames were sending in some samples on this well. We haven't received them to my knowledge

WZH.

McCallsburg town well

Present depth 475'±

Loc. NE NW NE Sec. 22 T85N. R.21W

Elev. about 3' below M.S.L. sta. by hand level.

Elev. sta - 1090±

− 3

Elev. L.S. at well site 1087'±

Story
Marshall

May 29, 1951

Mr. H. B. Pedersen
Superintendent and Manager
Marshalltown Water Works
Municipal Building
Marshalltown, Iowa

Dear Mr. Pedersen:

Thank you very much for your letter of May 28 concerning the testing of the McCallsburg well.

We will be very much interested in observing the testing of the well and I will look forward to further word from you when the precise date and time have been established.

Very truly yours,

H. C. Hershey

HCH:emh

H. V. PEDERSEN
SUPT. AND MGR.

MARSHALLTOWN WATER WORKS

MUNICIPAL BUILDING
MARSHALLTOWN, IOWA

May 28, 1951

Dr. G. H. Hershey
Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Dear Dr. Hershey:

This is to advise you that the well drillers, Hoeg and Ames, are about ready to test the well at Mc Callsburg. They have been drilling into the Cedar Valley limestone formation and are down around 1100 feet. The last report I have is they may get a 50 G.P.M. well.

I know you are interested in this well and that you would like to send someone to observe the test and check the drawdown, so I am sending this advance notice. Just as soon as I am notified of the exact date they expect to start the pumping test, I will either call by phone or send you a note. It may be either the last of this week or the first of next week, depending somewhat upon the weather.

Very truly yours,

HV Pedersen

H. V. Pedersen

HVP:c

McCallsburg
Story Co.

IOWA PRESS
CLIPPING BUREAU
Des Moines, Iowa

file

Journal
Nevada, Iowa

JAN 13 195

Progress Being Made On McCallsburg Well

McCALLSBURG — H. V. Pederson of Marshalltown was in McCallsburg Thursday inspecting the new well that is being drilled. Mr. Peterson is the engineer.

They are now down a total of 190 feet, but have not yet reached solid rock. Ten inch casing was used the first 90 feet, but then because of a cave in, 12 inch casing was used.

McCallsburg
Story Co.

IOWA PRESS
CLIPPING BUREAU
Des Moines, Iowa

Tribune
Ames, Iowa

JUL 15 1950

McCallsburg Will Talk Over Plans For Water System

Town meeting will be held Monday evening at 8 o'clock in the McCallsburg fire station to decide if a water system for the town shall be secured, and if so, the amount of indebtedness advisable to undertake.

All voters of McCallsburg, especially property owners and prospective water users, are urged to attend.

H. V. Peterson, consulting engineer of Marshalltown, and R. A. Rockhill, authority on municipal law, will be present at the meeting.

If proposals and estimates are acceptable to the voters, the town council will be petitioned to submit the proposition to a vote at the polls in the near future.

IOWA PRESS
CLIPPING BUREAU
Des Moines, Iowa

Journal
Nevada, Iowa

SEP 23 1950

Official Publication

MAYOR'S PROCLAMATION
Notice of Special Municipal Election
McCallsburg, Iowa

PUBLIC NOTICE IS HEREBY GIVEN that a special municipal election will be held on the 9th day of October, 1950 at the Town Hall in the Town of McCallsburg, Iowa, from eight o'clock A.M., to eight o'clock P.M., at which special municipal election there will be submitted to the legal and qualified electors of the Town of McCallsburg, Iowa, to be by them voted upon, the proposition of establishing a waterworks system in the Town of McCallsburg, Iowa, at a cost not to exceed Forty Thousand ($40,000.00) Dollars and there will be submitted as a separate additional proposition of constructing such waterworks system and incurring indebtedness for such purpose not to exceed Twenty-four Thousand ($24,000.00) Dollars, and issuing bonds in payment of such indebtedness for such purpose not to exceed Twent-four Thousand ($24,000.00) Dollars, and levying an annual tax of ten (10) mills upon the taxable property liable therefor in the Town of McCallsburg, Iowa, to pay said bonds and interest thereon as the same shall severally become due.

That at said special municipal election the ballots to be used for the submission of the above and foregoing separate propositions will be in substantially the following form:

(FACE OF BALLOT)

Notice to Voters: For an affirmative vote on the following proposition, make a cross (x) mark in the square to the right of the word, "YES". For a negative vote, make a similar mark in the square to the right of the word, "NO."

"Shall the Town of McCallsburg, Story County, Iowa, establish a waterworks system in and for said Town at a cost not to exceed Forty Thousand ($40,000.00) Dollars?" YES ☐ NO ☐

Notice to Voters: For an affirmative vote on the following proposition, make a cross (x) mark in the square to the right of the word, "YES". For a negative vote, make a similar mark in the square to the right of the word, "NO".

"Shall the Town of McCallsburg, Iowa, construct a waterworks system in and for the Town of McCallsburg, Story County, Iowa, and incur and contract indebtedness for such purpose not exceeding Twenty-four Thousand ($24,000.00) Dollars and issue bonds of the Town of McCallsburg, Iowa, for such purpose in an amount not exceeding Twenty-four Thousand ($24,000.00) Dollars, and levy a tax annually for not more than twenty (20) years upon the taxable property in the Town of McCallsburg, Story County, Iowa, subject to said tax not exceeding ten (10) mills per annum for the payment of such bonds and interest thereon as the same shall severally become due?" YES ☐ NO ☐

(BACK OF BALLOT)
Official Ballot For
Establishing Waterworks Proposition and For Incurring an Indebtedness And Issuing Bonds Therefor
Special Municipal Election
McCallsburg, Iowa
Town Hall
October 9th, 1950
F. E. Nail
Town Clerk

That all legal and qualified electors of the Town of McCallsburg, Iowa, are hereby notified to appear and vote at said election.

This notice is given by authority of a resolution of the Council of the Town of McCallsburg, Iowa, adopted on September 4th, 1950, pursuant to a good and sufficient petition with the requisite signatures of qualified electors of the Town of McCallsburg, Iowa, and pursuant to the authority of Chapters 397 and 407, Code of Iowa for 1950.

Dated at McCallsburg, Iowa, this 5th day of September, 1950.

Harlan F. Tett
Mayor, Town of McCallsburg, Iowa.

Attest: F. E. Nail
Clerk, Town of McCallsburg, Iowa.

Published in Nevada Evening Journal Sept. 9-16-23, 30, 1950.

McCallsburg
(Story Co.)

IOWA PRESS
CLIPPING BUREAU
Des Moines, Iowa

Journal
Nevada, Iowa

OCT 9 1950

McCallsburg Voters In Favor of New Well

MCCALLSBURG — The people of McCallsburg voted Monday in favor of a new well. The ballot count read thus: A total of 129 votes were cast, with 108 for and 21 against.

The issues considered were, first, whether or not the town of McCallsburg should establish a water works at a cost not to exceed $40,000., and second, should the amount of $24,000, be raised by issuing bonds to citizens and the remaining $16,000. obtained by selling utility rights.

Since the town has voted in favor of the issue, work on the new well and distribution system will get underway as soon as possible.

IOWA PRESS
CLIPPING BUREAU
Des Moines, Iowa

Record
Roland, Iowa

OCT 12 1950

BURG VOTES WATER SYSTEM

The citizens of McCallsburg went to the polls Monday to vote on whether the town should drill a new well for fire protection, to cost not to exceed $40,000, the amount of $24,000 to be raised by issuing bonds and $16,000 to be obtained by selling utility rights. The vote resulted in 108 favoring the proposition and 21 opposed. It is expected that work will commence soon on the system.

Story

March 21, 1951

Mr. S. R. Ames
Lincoln, Iowa

Dear Mr. Ames:

We have completed the examination of the cuttings from the McCallsburg town well to a depth of 650 feet. The top of the Maple Mill shale appears to have been encountered at a depth of about 635 feet.

The lower 100 feet of dolomite belonging to the Hampton formation and occurring between a depth of 535 and 635 feet is finely porous. This does not indicate that this section is permeable but it does suggest that this interval might be more successfully treated by shooting or acidizing than other strata open to the hole.

We will appreciate learning of developments in regard to this well and if we can be of further assistance to you on this project, please let us know.

Very truly yours,

H. G. Hershey

HGH:WEH:emh

Story MAR -3 '51

HOEG & AMES

WATER SYSTEMS — WELL CONTRACTORS — WELL SUPPLIES

▲

LINCOLN, IOWA

March 2, 1951

Mr. Wm. Hale

Iowa Geological Survey

Iowa City, Iowa

Dear Friend Bill,

Ervol, informs me that he is down 512 feet at Mc-Callsburg and has rock and shale.

Since you have picked up the samples, can you tell us what to expect in regard to formations and where we can expect to pick up some water?

Will appreciate hearing from you, I remain.

Yours very truly,

S. R. Ames
By: H.S.

SRA:HCS

S. R. Ames

casing 8" 10" = 350 8" = ——

Wayland 1380' – 145' – 10' at 25gpm

3/5/51 Called S.R. Ames re McCallsburg estimated 625'± to top M.M. might get water in Hampton

S R Ames said water was encountered at Wayland at 1380' will continue to drill through water bearing bed SWL 145' dd 10' at 25gpm.

WEH.

Story

February 6, 1951

Mr. S. R. Ames
Lincoln, Iowa

Dear Mr. Ames:

We have completed the examination of the samples to a depth of 350 feet from the well you are drilling for the town of McCallsburg, Iowa. Based on the samples, material of glacial origin was apparently drilled to a depth of 75 feet. Shales with some sandstone, all of Pennsylvanian age, were drilled in the interval from 75 feet to 350 feet, the depth to which we have samples. There were no cuttings of limestone which would suggest that strata of Mississippian age had been reached.

McCallsburg is located on the eastern flank of a structural high in rocks of Mississippian age and older. The axis of this high trends northeast from Ames through Roland. Immediately to the east of the axis, the rocks of Mississippian age apparently descend at the rate of about 50 feet to the mile. McCallsburg may be located near the eastern margin of this structure. A few wells to the east and south of McCallsburg encounter the top of the Mississippian rocks at an equivalent depth of about 350 feet at McCallsburg. This would suggest that the base of the Pennsylvanian rocks is not much lower than 350 feet at McCallsburg. However, erosion prior to the deposition of Pennsylvanian rocks may locally have created a depression in the Mississippian rocks to a depth somewhat greater than 350 feet below the present land surface.

Depending on whether the greater thickness of Pennsylvanian strata at this site is due to pre-Pennsylvanian erosion or structure, the upper part of the Mississippian strata may be absent or the entire section may occur at a lower depth than that shown on the forecast in our letter of January 24.

We are particularly interested in this well and will be glad to examine the cuttings from below 350 feet if you care to send them in. They may be sent by express collect. We may then be in a position to inform you of any adjustments necessary for the remainder of the forecasted section.

Very truly yours,

William E. Hale

WEH:emh