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

W 9241

RECORD OF WELL

Location:

Town: Belmond (NE) (SW): County Wright

SW SW SE SW 19 93 23 E.

sec. 25 T. 93 N., R. 25 W. Twp.

location field checked Davis 1976

Well name and number Belmond #2

Owner Belmond Address Belmond, Ia.

Tenant Address

Contractor Hoey & Ames Address Lincoln, Ia.

Drillers Ervol Finta

Drilling dates 11-29-57 to 1-21-58

Well data:

Altitudes: Drilling curb 1188 feet; Land surface 1186' feet

Rowat & Murray

Determined by

Topographic position

Total depth: Reported 208 feet, Measured feet

Drilling method Cable

Hole and casing data 72' of 16"

100' 12"

16" Drive Shoe

115 10" Perforated

Original depth to water ft. above / below Date

Source of data

Sources of water: Principal

Others

Production Data

Date				
Static water level				
Measuring point				
Pumping water level				
Yield (g. p. m.)				
Duration of pumping				
Specific capacity				

Pump Data

Type pump _____ Column diameter and length _____

Cylinder or bowls diameter and length _____

Suction pipe _____ Airline _____

Power _____ Production _____ g. p. m. for _____ hours per day

Use of water _____

Dissolved constituents and properties (in parts per million except as indicated)

Date sampled				
Sampled by				
Silica (SiO_2)				
Iron (Fe)				
Manganese (Mn)				
Calcium (Ca)				
Magnesium (Mg)				
Potassium (K)				
Sodium (Na)				
Carbonate (CO_3)				
Bicarbonate (HCO_3)				
Sulfate (SO_4)				
Chloride (Cl)				
Fluoride (F)				
Nitrate (NO_3)				
Dissolved solids				
Hardness (as $CaCO_3$)				
Total				
Grains per gallon				
Noncarbonate				
Alkalinity (as $CaCO_3$)				
pH				
Specific conductance (micromhos at 25°C)				
Temperature (°F)				
Analysis No.				

Laboratory Data

NB1-20

Well No. W 9241 Sample range 0-200 No. of samples 51

No. of dupls. and cond. 51 - Good to Fair Washed range 75-200

Samples prepared by C. Tyrrell & V. Dow Date 1-31-58

Logged by Northup Date 2/3/58

Correlations by _____ Date 2/3/58

GW Belmond G.D.
Wright Co.

July 12, 1977

Leland Jenison
Box 272
Belmond, Iowa 50421

Dear Mr. Jenison:

On July 5 you called us concerning information on water availability for an industrial site at Belmond, Iowa, presumably on the east side of the city in the SE¼NE¼ sec. 30, T.93N., R.23W., Wright County.

Enclosed find a xerox reproduction of a portion of the Belmond topographic quadrangle on which I have outlined the site under consideration and some of the nearest wells of which we have data. Logs of the city well No. 1, the General Mills, Inc. wells and the Tomco Hybreds well are also enclosed. A generalized summary of the formations expected beneath the industrial tract on the east side of town is outlined as briefly follows:(all depths are referred to an assumed surface altitude of 1,182 feet above sea level):

Formation	Depth Range (ft.)
Pleistocene Series (soil at top underlain by glacial drift, usually usually contains appreciable sand and gravel)	0 - 85±
Mississippian System	
Hampton Formation (dolomite, minor chert)	85± - 180
Chapin Dolomite	180 - 200
Prospect Hill silty dolomite	200 - 210
Devonian System	
Maple Mill Shale	210 - 230
Aplington Dolomite, trace of chert	230 - 235
Lime Creek Formation (dolomite and limestone in upper third, shale and dolomite alternating in lower two-thirds)	235-- 410
Cedar Valley Formation (dolomite)	410 - 700
Ordovician System	
Maquoketa Formation (dolomite)	700 - 860

These depthsfigures are thought to be reasonably accurate but some allowance for error is in order owing to local variations in the structure and thickness of the strata.

The project site appears to lie on the edge of a braod terrace just downstream from the merger of the East Branch and West Branch of the Iowa River. The city is built on this terrace. There are several gravel pits along this reach of the river suggesting the alluvial sands and gravels may be rather extensive beneath the valley floor.

Potential sources of water supply to wells at this location are: 1) the alluvial materials where they are hydraulically connected to the river, 2) the upper bedrock aquifer of Mississippian age, and 3) the deeper-lying carbonate formations representing the Cedar Valley Formation of Devonian age and the Maquoketa-Galena Formations of Ordovician age. Although we do not have any records of large capacity wells pumping from the alluvial aquifer at Belmond there is some chance that a production of 300 gpm or so could be developed from this source near the river. Since you are situated at least half a mile from the river the prospects for using this source may not be too good.

The Belmond city well No. 2 (1957) 208 feet deep, located at the center of the city, and the General Mills, Inc. well (1951) 210 feet deep at the south edge of the city both tested as high as 500 gpm. The specific capacity of the city well was 8.3 gpm/ft. and the General Mills, Inc. well 36.6 gpm/ft. Such favorable conditions indicate the dolomite locally is quite porous or creviced and may yield large quantities of water to wells where the bore hole intersects these openings. If the well fails to intersect a good crevice the results may be rather disappo nting. In this case, drilling might be continued into the Cedar Valley-Maquoketa-Galena interval between about 410 and 975 feet. Both the city and General Mills, Inc. have wells completed in these intermediate formations at depths of 520 and 545 feet respectively. The city well delivers about 430 gpm and the General Mills well a bit more than 400 gpm at a specific capacity of 15.5 gpm/ft. The Mississippian section was left open in the General Mills well.

The Jordan Sandstone and associated dolomite at much greater depth, say at about 1,550 feet, will be an additional source of large water supplies, on up to 500-1,000 gpm or more. The fact that few wells extend to the Jordan aquifer in this vicinity indicates that ample water generally can be found in the upper and intermediate zones.

From the foregoing, the outlook is fair to good that a production of 300 gpm can be obtained from one of the sources described in this letter--alluvial sands above 85 feet, Mississippian-age carbonates between about 85 and 210 feet, and the Cedar Valley-Maquoketa-Galena carbonates at about 410-975 feet. I would advise that a bedrock well be located as far east as the property holdings will permit to reduce the interference affects with the city wells.

I hope this is the information you wanted. If any questions remain or if I can be of additional assistance on this matter, please let me know.

Very truly yours,

Paul J. Horick
Chief, Ground Water Division

PJH:rlh
enclosure

GROUND WATER REQUEST FORM

Date 7/5/77

Handled by BOUNK

Caller Leland JENISON. Box 272 Belmond Iowa 50421

℗ 515 444 2351

Information desired Forecast

Who is this information for(check) [ ] city or town [X] industry

[ ] domestic [ ] irrigation [ ] recreation [ ] other(specify)

Location of site Belmond Wright Co. T 93N R 23W (NE¼ Sec 30) App about 1 Mi South of Existing City wells (40 Acres)

Elevation of well

How much water wanted(gpm) 300

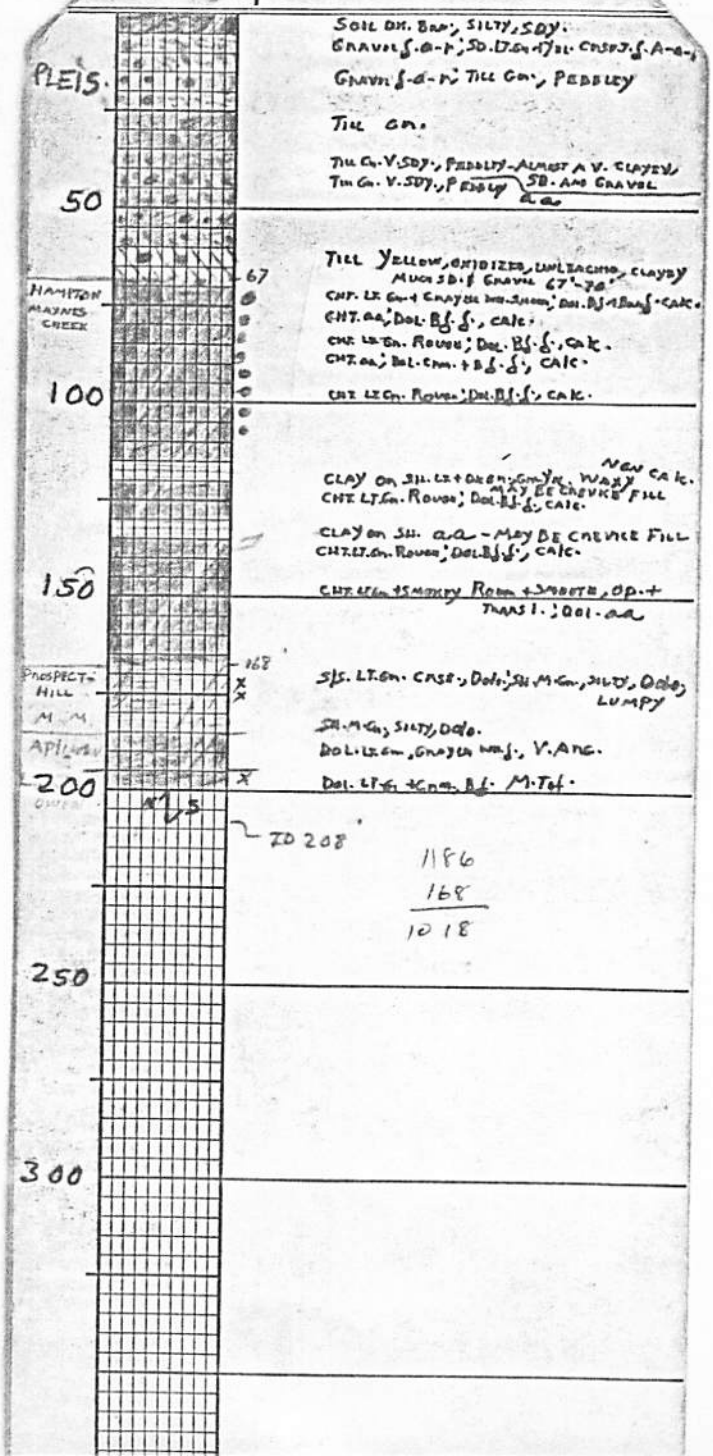
Is water quality or temperature restricted(specify) Temperature probably should Be below 65°F To be used For cooling

Any information on present wells(location,depth,casing,production, etc.) ONE City Well ~190' Deep other ~500' Deep (General Mills) Central Soya Has wells ~1 Mi West possibly 170' Deep

Other information or comments Need as soon as possible

FORM NO. 79—In stock and for sale by Ross-Martin Co., Tulsa W-9241

STATE IOWA	BELMOND (WRIGHT)
SW SW SE SW	BELMOND CITY WELL #2 (1957)
SEC. 19	
TWP. 93N. RGE. 23W.	COMMENCED NOV. 29, 1957 – COMPLETED JAN. 21, 1958
	HOEG & AMES – ENVOL FINK
	CASING RECORD 72' OF 16" CASING 100' OF 12" CASING
	115' OF 10" CASING SET @ 208' – PERFORATED
	LOGGED FEB. 3, 1958 BY NORTHUP
EL 1186'	REMARKS
TD 208'	SWL 26
	PL 90' @ 500 GPM
UEV 2-10-58	sp. cap. 7.8 gpm/ft.
NB1-20	



FORM NO. 79—In stock and for sale by Ross-Martin Co., Tulsa. W-5577

STATE IOWA	BELMOND (WRIGHT)
SE SE SE SE	GENERAL MILLS, INC.
SEC. 25	
TWP. 93N RGE. 24W	COMMENCED JULY 1951 COMPLETED
	LAYNE-WESTERN
	CASING RECORD 20" csg set at 92' and cemented in 23" hole; open 18" hole below
	LOGGED SEPT. 2, 1952 BY NORTHUP
Topographic Map, El. 1175' 1974	REMARKS
TD 210'	SWL 20' 7/51
	PL 32' @ 490 GPM.
	Sp. Cap. 36.6 gpm/ft
CL8-1	

PLEIS.
GRAVEL, CRSE. a-r
GRAVEL aa + DIRTY; TILL GR.
TILL GR.
GRAVEL + V. CRSE. SAND - DIRTY
GRAVEL + SAND LT GR. CRSE., DIRTY
TILL GR.
TILL GR. aa + SOME YELLOW, OXIDIZED

50
TILL YELLOW
TILL GR., PEBBLEY

CRET.
SH., BRICK RED

HAMPTON
MAYNES CREEK
CHT. LT. GR. GRAN; DOL. CRM. f.
CHT. LT. GR., ROUGH + SUB VIT., TRANSL. + OP.; DOL. LT. GR. + LT. BRN. f.; CALCITE CLUSTERS

100
DOL. CRM. f. SOMEWHAT GRITTY, SILTY, CALC.
CHT. LT. GR. ROUGH; LS. CRM. f.
DOL. LT. GR. f. SILTY; LS. CRM. f.
DOL. LT. GR. f. SILTY; SH. GRITTY
CHT. LT. GR. ROUGH, OP.; SLI. MOT.; DOL. LT. GR., V. LT. BRN. f. SLI. SILTY
CHT. aa; DOL. V. LT. BRN. f. SAC., SILTY

150
CHT. aa + GR. SMOOTH, TRANSL.; DOL. aa
CHT. GR. ROUGH, MOT. OP.; DOL. GRAYISH BRN. f. SAC., SLI. POROUS
CHT. LT. + SMOKEY GR., ROUGH + SMOOTH, TRANSL. + OP. MOT.; DOL. aa

APLINGTON ?
CHT. LT. + M. GR., SMOOTH + ROUGH, MOT. OP.; DOL. LT. BRN. M. COARSER XLN. THAN ABOVE. - V. POROUS.
CHT. LT. + DK. GR., SMOOTH + ROUGH, MOT. OP.; DOL. aa

200
DOL. LT. BRN. M. TO f. V. POROUS

MAPLE MILL OR SHEFFIELD ?
DOL. aa; SH. LT. GR. DOLO.
TD 210'

Is this Aplington ?
Probably Chapin - Prospect Hill

FORM NO. 79—In stock and for sale by Ross-Martin Co., Tulsa. W-13052

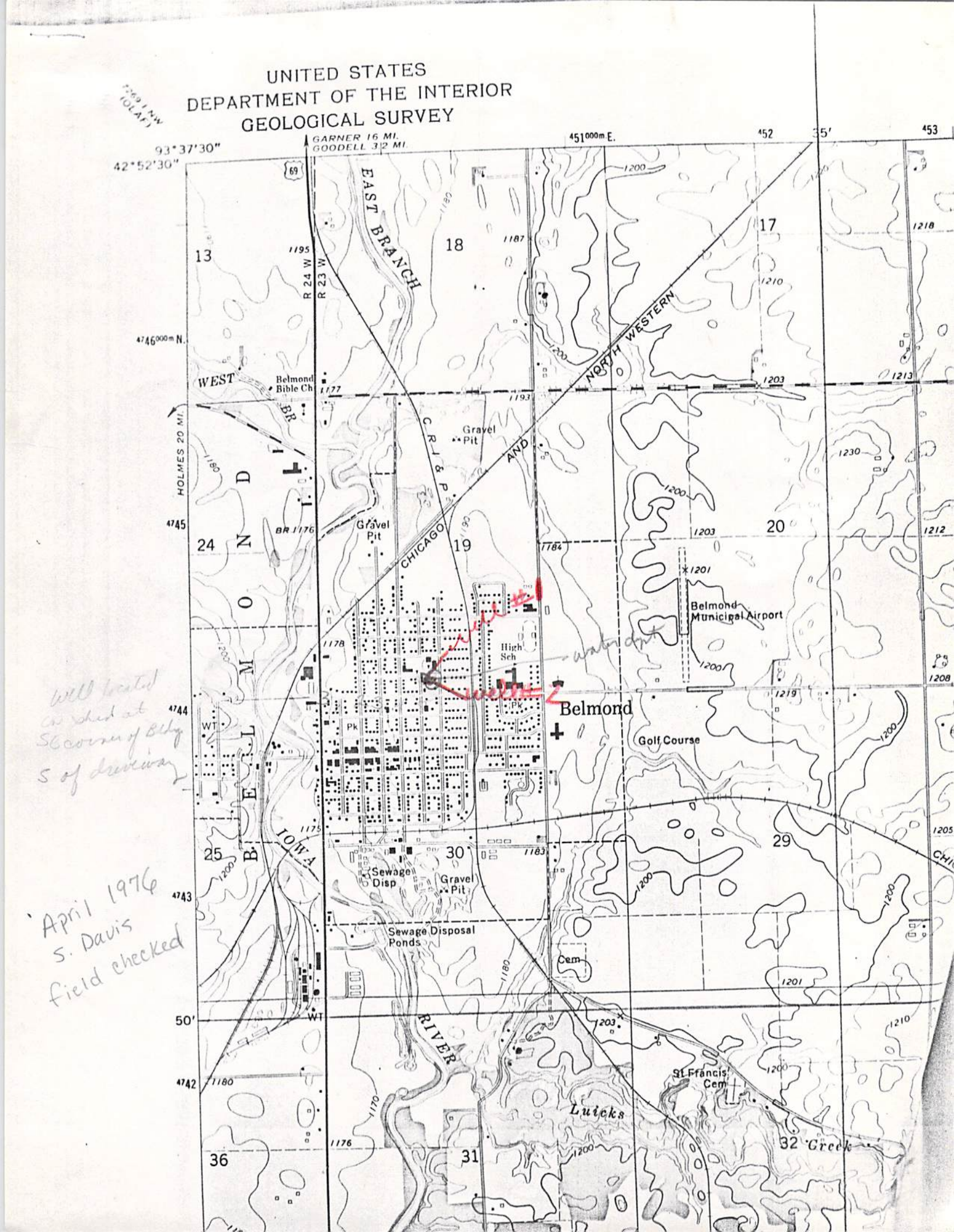
STATE Iowa	Belmond (Wright)
NW SW NE SE	Tomco Hybreds
SEC. 18	
TWP. 93 N. RGE. 23 W.	COMMENCED COMPLETED March, 1961
	Olsen Well Co.
	CASING RECORD 56' of 5" Blk. csg.
	22' of 4 1/4" open hole
	LOGGED 2/22/62 BY Koch
Topographic Map-1974 El. 1221'	REMARKS SWL 12'
T.D. 80'	P.L. 15' @ 50 G.P.M.
	Main Water 56'-70'
2-22-62	
TL4-211	

PLEIS.
Soil, Dk. Brn., Silty, Non-Calc.
8 Till, Yel. Oxid., Unlchd., v. Pebbley.
12 Gra., Gr., Yel., Crm. + Pk. M-f., A; Sd., v. Lt. Gr.,
16 Till, Pale Yel. Gr., Unoxid., v. Crse.-M., A-a. Unlchd., Sli. Pebbley
Till a.a. + Gr., Unoxid., Unlchd
Till, Pale Gr. Yel., Oxid., Unlchd., Sli. Sdy.
42

50
Maynes Cr.
51 Dol., Dk. Yel., f., Calc.; Gra., Gr., Yel. + Pk., M-f., A.
52 Cht., Gr. Crm., S; Dol., Dk. Yel., f., Calc., Soft, Sac., granular
58
63 Dol., Dk. Yel., f-v.f., Med. Hd. to v. hd., dnse., Calc.
68 Cht., Gr. wh., S.; Dol., Lt. Yel., f., Calc.
73 Cht., Gr. wh. to wh. + v. Lt. Tan, S; Dol., Lt. Yel.,
78 Cht. a.a.; Dol., v. Lt. Yel., f., Sli. Calc.
T.D. 80'

100

150



Well located as shown at SE corner of city S of driveway

April 1976
S. Davis
field checked

JAN 23 1958

ROWAT · MURRAY Engineers

BELMOND, IOWA

January 22, 1958

DRAINAGE
MUNICIPAL
TOWN PLANNING
STRUCTURAL
HIGHWAYS
MAPPING
ESTIMATES

Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Attention: Dr. Charles Brown

Gentlemen:

Under seperate cover we are sending one sample of water taken from the new deep well at Belmond, Iowa and one sample taken from the existing deep well. Both samples were taken at approximately the same time. As mentioned in our telephone conversation of yesterday, we would appreciate having a complete mineral analysis made on each of these samples. Due to the effect on the draw down of the existing well when test pumping the new well, we have reason to believe that the two supplies are interconnected due to crevices in the rock. Possibly, some of the water in the new well is coming from the Cedar Valley formation through the old well into the Mississippian formation of the new well. The old well draws its principal source of water from the Cedar Valley and has perforated casing in the Mississippian formation. We would appreciate any comments you may wish to make on the probably source of water after you have examined the mineral analyses.

Also as mentioned in our telephone conversation, we would appreciate receiving a complete log of the well at your earliest convenience. It is understood that you have received all of the drilling samples. If possible, we would appreciate one copy of the log for our files and one for the file of the city.

We appreciate your assistance on this project. Should there be any questions or lack of information, please feel free to contact us. Please return the two water containers and additional copies of your information sheet so that we may have them on hand for future projects.

Yours very truly,
ROWAT - MURRAY, ENGINEERS
R W Rosene
Robert W. Rosene, PE
cc: City Clerk - Belmond, Iowa

write - will send us the samples — as result of Telephone call 1/23/58 11:30 AM

However the well is completed - I will be coming out

LOG OF PUMPING TEST

Belmond Deep Well #2 January 18, 20 and 21, 1958

Rowat-Murray, Engineers
Belmond, Iowa

Hoeg and Ames, Inc.
Lincoln, Iowa

January 18, 1958

TIME	WATER LEVEL	DRAW DOWN	G.P.M.	REMARKS
8:30 AM	26	0		
10:30 AM	63	37	400	Water extremely dirty. Pump shut down to change bowls for more capacity.

January 20, 1958

2:55 PM	30			Started Pump
3:00 *	56	26	450	Water Very Dirty
3:05	58	28		
3:10	59	29		
3:15	59	29	350	
3:30	59	29		Speed Up Pump
3:45	72	42	450	Water dirty
4:00	74	44		
4:15	75	45	500	Speed up pump
4:30	85	55	500	Water very dirty
4:45	87	57		
5:00	90	60	500	Shut off to surge Water very dirty

5:00 PM to 12:00 Midnight surged pumped 15 min - Shut off 5 min. Pumped during surging 600 - 700 g.p.m.

12:00	64	34		Slowed Pump

* 18 ft. Drawdown on Well #1 from 3:00 PM to 4:00 PM January 20 due to pumping new well.

TIME	WATER LEVEL	DRAW DOWN	G.P.M.	REMARKS
12:30	64	34	500	Slowed pump
12:45	62	32	500	Slowed pump
1:00 AM	62	32	420	Slowed pump - water fairly clear
2:00	62	32	435	Water cloudy
3:00	62	32	430	Water cloudy
4:00	62	32	430	Almost clear
5:00	62	32	430	Almost clear
6:00	62	32	430	
7:00	65	35	430	Started Well #1 at 6:30 AM
7:15	66	36	420	
7:35	66	36	420	Shut pump off. Water clear
4:40	52	22		
7:45	50	20		
8:00	48	18		
8:10	48	18	450	Started Pump
8:30	65	35		
8:45	65 #1-7½'	35	535	Speeded pump up
8:50	74	44	535	
9:00	75	45		Water almost clear
9:15	77	47		
9:30	78 #1-5'	48	535	Water clear
9:45	79	49		
10:00	80	50		
10:15	80	50	535	
10:30	80	50		
10:45	80 #1-5'	50	535	Water clear - slowed pump
11:00	68	38	400	
11:15	67	37		Water clear

TIME	WATER LEVEL	DRAW DOWN	G.P.M.	REMARKS
11:30	67	37		
11:45	67 #1-8'	37	400	Water clear
12:00	67	37		
12:15	67	37		
12:3-	67	37		
12:45	67 #1-8'	37	400	Slowed pump
1:00	58	28	250	
1:15	58	28		
1:30	57	27		
1:45	57	27	250	Water clear
2:00	57	27		
2:30	57	27		Caught water sample
3:00	57	27	250	Stopped pumping

SUMMARY REPORT

TEST OF BEIMOND, IOWA WELL NO. 2

A. A pumping test was run by Hoeg and Ames, Inc. on January 18, 20 and 21, 1958 on the new well (No. 2). Haydn Jones and Bob Rosene represented ROWAT - MURRAY, ENGINEERS. The purpose of the test was to obtain data on the quantity and quality of the available water.

B. The test was started at 8:30 A.M. on January 18, 1958. The well was pumped at varying rates up to approximately 400 gpm. The pumping was stopped after two hours to change the bowls on the pump to obtain additional capacity. The water was dirty during the entire pumping period. Pumping was resumed at 3:00 P.M. on January 20, 1958 and continued until 3:00 P.M. on January 21, 1958. The test was conducted in four phases.

First Phase: The well was pumped for 2 hours at varying rates in an attempt to clear the water.

Second Phase: The steady pumping was stopped and the well was surged for seven hours. This was accomplished by pumping for 15 minutes at a rate of from 600 to 700 gpm and then stopping the pump for 5 minutes.

Third Phase: The well was pumped for $7\frac{1}{2}$ hours at 400 to 500 gpm. At the end of this phase the water was clear.

Fourth Phase: The well was pumped for 2 hours at 535 gpm, then 2 hours at 400 gpm and finally 2 hours at 250 gpm. The water remained clear during the entire phase.

C. A water sample was taken at 2:30 P.M. when the water level was 57 feet below the surface of the ground. The pump was pumping at a rate of 250 gpm and had been pumping continuous since 8:45 A.M..

D. It was evident throughout the test that the rate of pumping on either Well # 1 or # 2 affected the drawdown on the other well.

PROPERTY OF

BY H.E.J DATE 1-22-58

ROWAT - MURRAY, ENGINEERS

BELMOND, IOWA

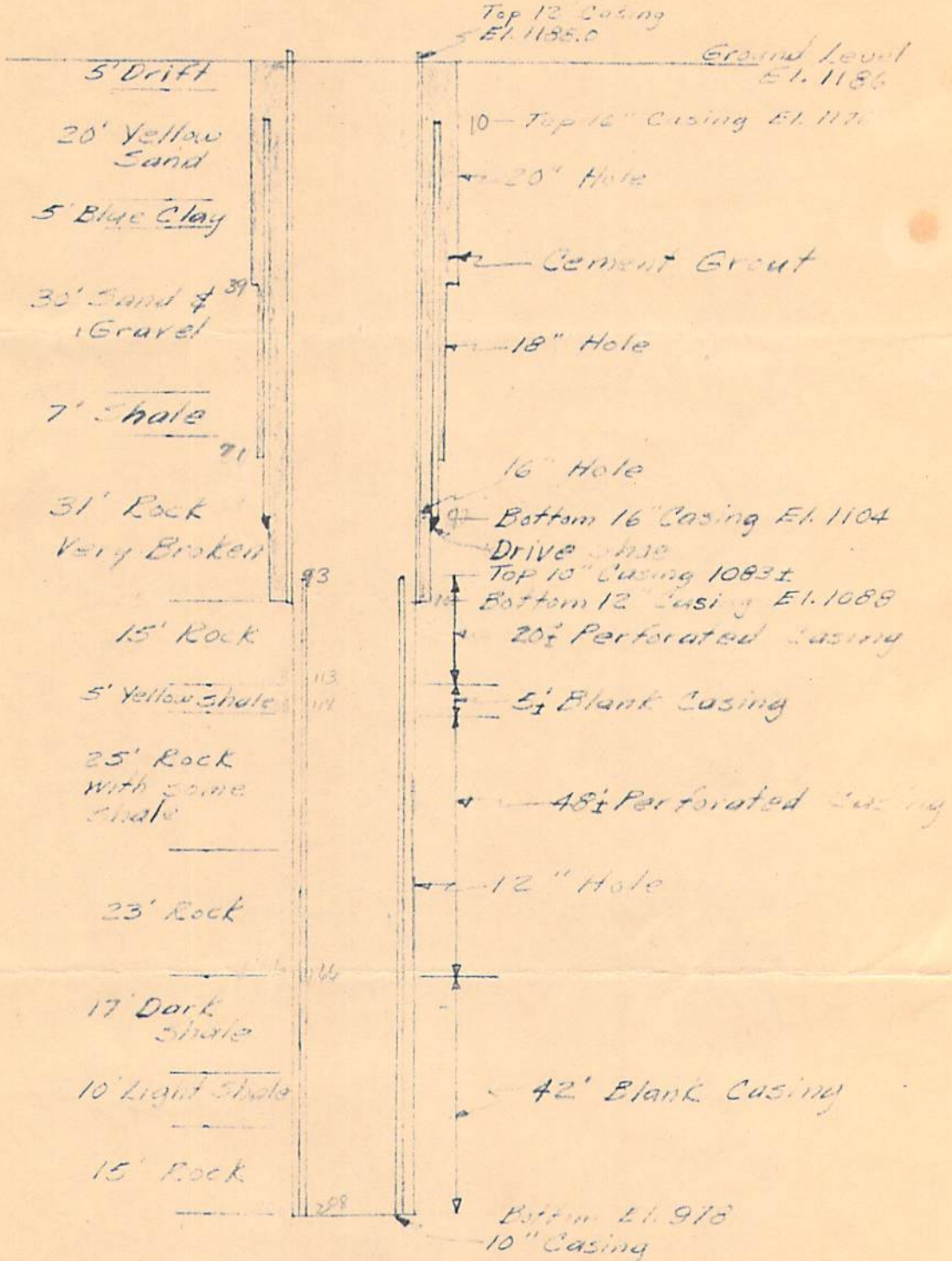
SHEET NO. 1 OF 1

CHKD. BY ..... DATE .....

SUBJECT WELL #2 PROFILE

BELMOND, IOWA

JOB NO. .....



Note: 10" casing has not been placed to date.

P R O P O S A L

City Council
Belmond, Iowa

Re: Belmond, Iowa Waterworks Improvements

Gentlemen:

The undersigned hereby declares that he has examined the specifications and contract documents prepared by Rowat-Murray, Engineers for the construction of waterworks improvements and having personally examined the site of the work hereby proposes to furnish all labor, tools, material and equipment required for such work in accordance with the following schedule of prices.

SCHEDULE OF BID PRICES

SECTION I

Item	Description	Quantity	Unit Price	Extension
	Well			
1.	For setting up and removing equipment, complete.		Lump Sum	_____
2.	For drilling a sufficiently large hole from ground elevation to depth of 30' and furnishing, placing and removing temporary min. 20" O.D. casing, complete.	30 L.F.	_____/L.F.	_____
3.	For drilling a 17" min. diameter hole from 20' to 140' for 12" O.D. casing complete.	120 L.F.	_____/L.F.	_____
4.	For furnishing and placing 12" O.D. 0.365" wall steel casing from 2' above ground surface to 140', complete in place.	142 L.F.	_____/L.F.	_____
5.	For drilling 12" diameter open hole from 140' to 230' complete.	90 L.F.	_____/L.F.	_____
6.	For furnishing, setting up and removing of pressure grout cementing unit and grouting shoe, complete.		Lump Sum	_____
7.	For furnishing and placing neat cement grout by pressure method (Holland process or equal) in the annular space around the 12" casing from 0 to 140'.	200 Sacks	_____/Sack	_____
8.	For furnishing, installing and removing test pump as specified, complete		Lump Sum	_____
9.	For operating test pump for testing of yield and drawdown	24 hours	_____/Hr.	_____
	Total Base Bid Section I - Items 1 through 9			_____

Alternates	Unit Price
10. Furnishing and placing 10" I.D. .365" wall steel casing complete with forged steel entering shoe and drive shoe	_____/L.F.
11. Furnishing and placing 8" I.D. .322" wall steel casing complete with forged steel entering shoe and drive shoe	_____/L.F.
12. For drilling 10" open hole if required	_____/L.F.
13. For drilling 8" open hole if required	_____/L.F.
14. For installing and removing test pump for additional test pumping if required	Lump Sum

If awarded the contract we will begin construction within _____ days and will complete construction within _____ calendar days after the acceptance of this proposal.

As evidence of good faith, we herewith submit a certified check for $_____ being not less than 5% of our base bid. This check shall become the property of the City of Belmond, Iowa in the event that the undersigned fails to enter into a contract with said City and to furnish bond or bonds to validate said contract within ten (10) days after date of acceptance of this proposal.

Respectfully submitted,

_____

by _____
Name Title

Project No. 853

S P E C I F I C A T I O N

FOR

W A T E R W O R K S I M P R O V E M E N T S

BELMOND, IOWA

Prepared by

ROWAT - MURRAY, ENGINEERS

Belmond, Iowa

1957

I N D E X

Cover Sheet
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Notice of Hearing and Letting 3
Instructions to Bidders 5
Proposal Form 6
Form of Contract. 8

General Specifications. 9

Specifications for Deep Well. 22

Special Provisions. 30

Figures

1. Profiles of Existing and Proposed Wells

PROPERTY OF

ROWAT - MURRAY, ENGINEERS

BELMOND, IOWA

BY RWR DATE 10/29/57

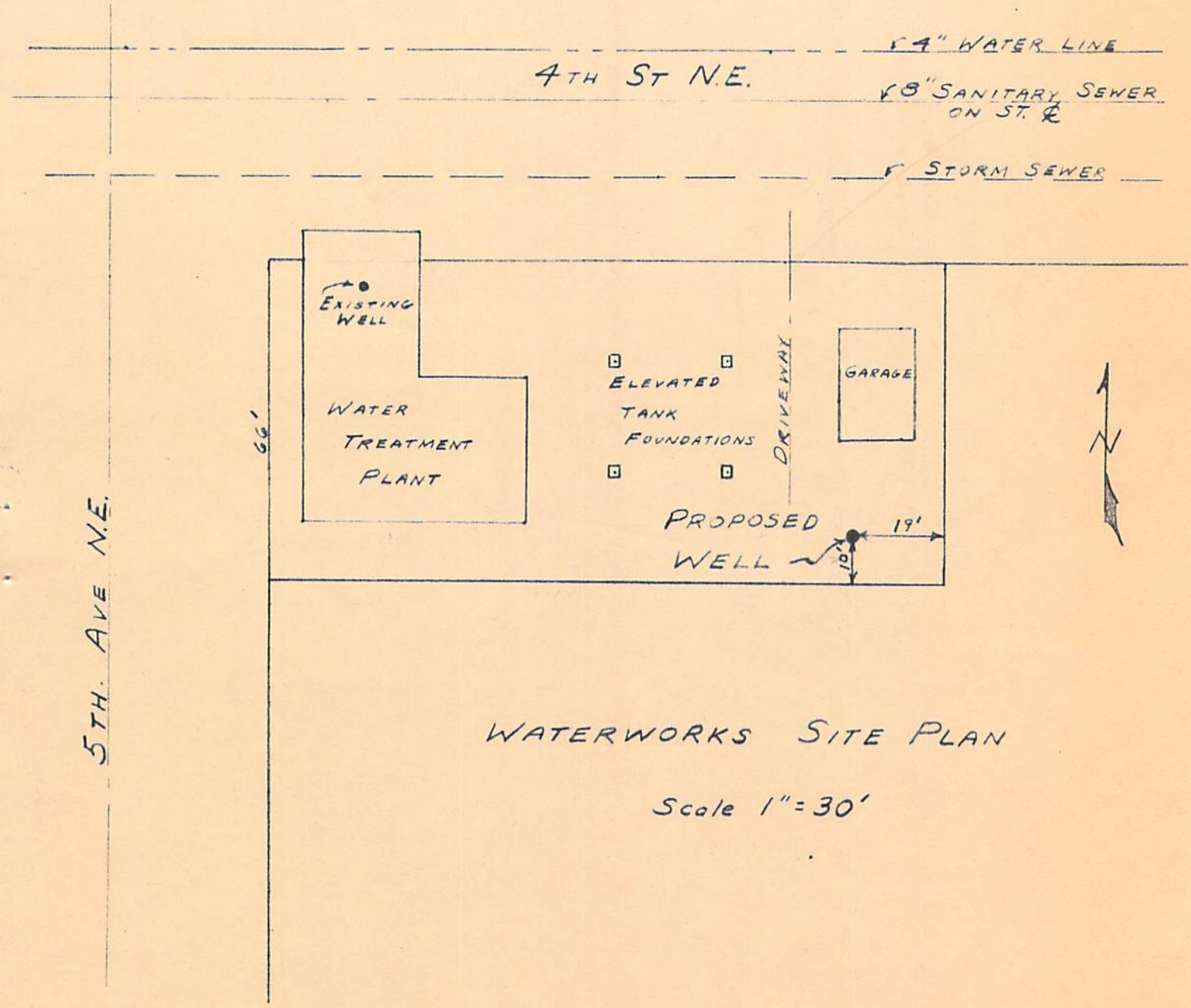
CHKD. BY ..... DATE .....

SHEET NO. 1 OF 1

JOB NO. 853

SUBJECT DEEP WELL #2

BELMOND, IOWA



WATERWORKS SITE PLAN

Scale 1" = 30'

NOTICE OF HEARING AND LETTING

Sealed proposals will be received by the City Clerk of the City of Belmond, Iowa, at her office in said City until 8:00 o'clock P.M. on November 21, 1957 for the Construction of Waterworks Improvements as described in the plans and specifications now on file in the office of the City Clerk. Proposals will be acted upon by the City Council of said City at a meeting to be held at the time above specified or at such later time as may be fixed. At said time and place a hearing will be held on the proposed plans and specifications and proposed form of contract for said improvements, and at said hearing any interested person may appear and file objections thereto or to the cost of said improvements.

The extent of the work to be done is as follows:

Construction of a 12" well approximately 230 feet deep including all drilling, casing, testing, grouting, disinfection and related items of materials and work.

All work is to be done in strict compliance with plans and specifications prepared by Rowat-Murray, Engineers of Belmond, Iowa, unless notified of change by the Engineer in charge. The above mentioned plans and specifications have heretofore been approved by the City Council, and are now on file for public examination in the office of the City Clerk and may be examined by bidders.

Each proposal shall be made on a form furnished by the City or Rowat-Murray, Engineers and must be accompanied by a check, certified by an Iowa bank in an amount equal to or greater than five per cent (5%) of the amount of the proposal made payable to the City Treasurer of the above City and filed in a sealed envelope. This check may be retained by the City Treasurer as liquidated damages in the event the successful bidder fails to enter into a contract within ten (10) days and post bond satisfactory to the City insuring the faithful fulfillment of the contract and maintenance of said improvements as required by law.

Payment to the contractor for said improvements will be made in cash from existing funds in the utility fund of the City.

No bidder shall withdraw his bid for a period of thirty (30) days after the date of opening of bids.

By virtue of statutory authority, a preference will be given to products and provisions grown or produced within the State of Iowa, and to Iowa domestic labor.

The successful bidder will be required to furnish a bond in an amount equal to one hundred per cent (100%) of the contract price, said bond to be issued by a responsible surety approved by the City Council and shall guarantee the faithful performance of the contract and the terms and conditions therein contained and shall guarantee the prompt payment for all materials and labor, protect and save harmless the City from claims and damages of any kind caused by the operation of the contractor.

Plans and specifications for private use may be obtained from the Engineers or the City Clerk upon a deposit of $15.00 all of which will be refunded to anyone filing a complete and bona fide bid and to others $10.00 will be refunded, provided in all cases that such plans and specifications are returned in good order within two weeks after the date of receiving bids.

The City reserves the right to reject any or all proposals, to waive informalities or irregularities in any bid, to determine whether a contractor is responsible, and to enter into such contract as it shall deem to be for the best interest of the City.

Published on order of the City Council of Belmond, Iowa.

By Carrie Courtney City Clerk

INSTRUCTION TO BIDDERS

PROPOSALS

Sealed proposals will be received at the time and place outlined in the Notice of Hearing and Letting. All proposals shall be on forms supplied by the owner or Rowat - Murray, Engineers.

Proposals must be submitted properly filled out with ink or typewriter in a clear and legible form without erasure, interlineation or changes. In cases of discrepency between unit prices and extended totals, the unit price will be considered as correct. If not made in accordance with Instruction to Bidders, the proposal will be subject to rejection as irregular, yet the owner reserves the right to waive any irregularity.

Proposals shall be made out to show the exact name and post office address of the contractor and shall be signed by the principal of the organization. If a co-partnership, the names of all partners shall be given. If the proposal is submitted by an agent, satisfactory evidence of agency authority must accompany the proposal.

It is expressly understood that by submitting a proposal the bidder acknowledges that he has examined the location or site of the proposed improvement and the plans and specifications, has satisfied himself of the feasibility and correctness of same and accepts all terms and conditions thereof.

ADDITIONAL INFORMATION

The contractor's attention is directed to the Notice of Hearing and Letting for pertinent information on method of payment, contract completion time, bid security, liquidated damages, if any, and maintenance bond requirements.

CONTRACTOR COMPETENCE

The contract will be let to the lowest responsible bidder. The contractor must be actively engaged in the classes of work provided for in the plans and specifications and must be able to furnish evidence to the satisfaction of the Council and the Engineer of his ability to successfully perform the contract.

INTERPRETATION OF CONTRACT DOCUMENTS

Should any bidder find discrepancies in or omissions from the plans or specifications, or should he be in doubt as to the meaning of certain parts, he shall at once notify the engineers who will send written instructions covering the items of question to all bidders.

DEFINITION

Whenever the term "Engineers" appears in these specifications, it shall be understood to mean ROWAT - MURRAY, ENGINEERS, Belmond, Iowa or its duly authorized representatives.

P R O P O S A L

City Council
Belmond, Iowa

Re: Belmond, Iowa Waterworks Improvements

Gentlemen:

The undersigned hereby declares that he has examined the specifications and contract documents prepared by Rowat-Murray, Engineers for the construction of waterworks improvements and having personally examined the site of the work hereby proposes to furnish all labor, tools, material and equipment required for such work in accordance with the following schedule of prices.

SCHEDULE OF BID PRICES

SECTION I

Item	Description	Quantity	Unit Price	Extension
	Well			
1.	For setting up and removing equipment, complete.		Lump Sum	_____
2.	For drilling a sufficiently large hole from ground elevation to depth of 30' and furnishing, placing and removing temporary min. 20" O.D. casing, complete.	30 L.F.	_____/L.F.	_____
3.	For drilling a 17" min. diameter hole from 20' to 140' for 12" O.D. casing complete.	120 L.F.	_____/L.F.	_____
4.	For furnishing and placing 12" O.D. 0.365" wall steel casing from 2' above ground surface to 140', complete in place.	142 L.F.	_____/L.F.	_____
5.	For drilling 12" diameter open hole from 140' to 230' complete.	90 L.F.	_____/L.F.	_____
6.	For furnishing, setting up and removing of pressure grout cementing unit and grouting shoe, complete.		Lump Sum	_____
7.	For furnishing and placing neat cement grout by pressure method (Holland process or equal) in the annular space around the 12" casing from 0 to 140'.	200 Sacks	_____/Sack	_____
8.	For furnishing, installing and removing test pump as specified, complete		Lump Sum	_____
9.	For operating test pump for testing of yield and drawdown	24 hours	_____/Hr.	_____
	Total Base Bid Section I - Items 1 through 9			_____

	Alternates	Unit Price
10.	Furnishing and placing 10" I.D. .365" wall steel casing complete with forged steel entering shoe and drive shoe	_____/L.F.
11.	Furnishing and placing 8" I.D. .322" wall steel casing complete with forged steel entering shoe and drive shoe	_____/L.F.
12.	For drilling 10" open hole if required	_____/L.F.
13.	For drilling 8" open hole if required	_____/L.F.
14.	For installing and removing test pump for additional test pumping if required	Lump Sum

If awarded the contract we will begin construction within _____ days and will complete construction within _____ calendar days after the acceptance of this proposal.

As evidence of good faith, we herewith submit a certified check for $_____ being not less than 5% of our base bid. This check shall become the property of the City of Belmond, Iowa in the event that the undersigned fails to enter into a contract with said City and to furnish bond or bonds to validate said contract within ten (10) days after date of acceptance of this proposal.

Respectfully submitted,

_____

by _____
Name Title

Project No. 853

C O N T R A C T

THIS CONTRACT made and entered into IN QUADRUPLICATE at _____

_____, this _____ day of _____, 195____ by and

between the City of _____ hereinafter called the City, and

_____hereinafter

called the Contractor.

WITNESSETH:

The Contractor hereby agrees to furnish all labor, tools, and equipment and to furnish and deliver all materials required for the proposed_____

_____

as indicated by the plans and specifications now on file with City Clerk of the City of _____.

Said plans and specifications, the Resolution of Necessity, the Resolution Ordering Construction, the published Notice to Contractors, the bid of the Contractor and the bond guaranteeing performance of the contract are hereby specifically made parts of this contract as fully as though set out herein verbatim.

On completion of the said improvement, the City agrees to pay to the Contractor therefore the prices set out in this bid; said payment to be made as prescribed in the Specifications and Contract D ocuments

The Contractor agrees to begin work on or before_____ and to complete the same on or before _____.

IN WITNESS WHEREOF, this contract has been executed IN QUADRUPLICATE on the date first herein written.

_____

Contractor

_____

Mayor

ATTEST:

_____

CITY CLERK

Total Contract Bid Amount_____

STANDARD GENERAL SPECIFICATIONS

Section 10 Definition of Terms

Section 20 Proposal Requirements and Conditions

Section 30 Award and Execution of Contract

Section 40 Scope of the Work

Section 50 Control of Materials and Work

Section 60 Legal Relations and Responsibility to the Public

Section 70 Prosecution and Progress

Section 80 Measurement and Payment

STANDARD GENERAL SPECIFICATIONS

SECTION 10. DEFINITION OF TERMS

10.1 CITY., The Party of the First Part in the accompanying contract acting through its authorized representatives.

10.2 COUNCIL., The authorized representatives of the Party of the First Part.

10.3 ENGINEERS., Rowat - Murray, Engineers, or their authorized representatives.

10.4 INSPECTOR., The authorized representative of the Engineers assigned to the detailed inspection of the work, or materials therefore, and to such other duties as may be delegated to him in these specifications.

10.5 CONTRACTOR., The Party of the Second Part in the accompanying contract for the improvement covered by these specifications or his authorized representative.

10.6 SUBCONTRACTOR., Any person, firm or corporation who has, with the approval of the Council, contracted with Contractor to execute and perform in his stead all or any part of the contract.

10.7 BIDDER., Any individual, firm or corporation submitting a proposal for all or a part of the work provided for in these specifications.

10.8 PROPOSAL GUARANTY., The security designated in the Notice to Bidders or Proposal, to be furnished by the bidder as a guaranty of good faith to enter into a contract and furnish an acceptable bond for the work contemplated, if it be awarded to him.

10.9 SURETY., The corporate body bound with and for the Contractor for the acceptable performance of the contract.

10.10 PROPOSAL., The written proposal, submitted by the bidder in the prescribed manner, and on the standard form, for the improvements covered by these specifications.

10.11 SPECIFICATIONS., The documents that set forth the manner in which the proposed work is to be accomplished, which have been prepared by the Engineers and approved by the Council, official copies of which are now on file with the Clerk.

10.12 SPECIAL PROVISIONS., Clauses or memoranda not contained herein, applying to the contract of which these specifications are a part, which change or supplement these specifications.

10.13 CONTRACT., The agreement entered into between the City and the Contractor setting forth the terms under which the work covered by the plans and specifications is to be performed. The contract includes all conditions, definitions, and instructions set forth in the official contract and specifications, the proposal, official plans, and all supplemental agreements entered into by the parties to the contract.

10.14 NOTICE TO BIDDERS., The notice calling attention of bidders to the time and place for receiving bids, containing a brief description of the work and briefly setting forth the requirements and conditions for submission of proposals.

10.15 INSTRUCTIONS TO BIDDERS., The clauses setting forth, in detail, the information relative to the proposed work and requirements for the submission of proposals.

10.16 PLANS., The plans for the improvement covered by the specifications and approved by the Council, official copies of which are on file with the Clerk.

10.17 CONTRACT BOND., The bond executed by the Contractor and his surety in favor of the City guaranteeing the complete execution of the contract in accordance with the plans and specifications, the payment of all debts pertaining to the work and maintenance of the work as provided by law or by the specifications.

10.18 CONTRACT PERIOD., The contract period is the period from the specified date for beginning the work to the specified date of completion, both dates inclusive. The contract period may be extended by the Council, as provided in these specifications in which event the contract period includes the new date of completion.

10.19 OFFICIAL PUBLICATIONS., The official publications are the formal resolutions and notices relative to the proposed improvement that are required by law to be published in a prescribed manner, and that have actually been published in accordance with the statutes relating therto. Attention is directed to the fact that those official publications are by statute vested with all of the force and effect of contract obligations.

SECTION 20. PROPOSAL REQUIREMENTS AND CONDITIONS

20.1 USE OF PROPOSAL FORM., Bidders will be furnished with proposal forms giving the description of the work, the time at which the work must be completed, and the amount of the proposal guaranty which must accompany the proposal, all of which must be in accordance with the official publications relating to the proposed improvement. To insure against accidental errors, the Contractor should read carefully the official publications before preparing his proposal.

20.2 ESTIMATE OF QUANTITIES., For all work let on a unit price basis the Engineers' estimate of quantities shown in the notice to bidders or proposal is understood to be qpproximate only, and will be used only for the purpose of comparing bids. For work let on a lump sum price basis any estimate of quantities provided is furnished for the convenience of bidders and is not guaranteed.

20.3 EXAMINATION OF THE PROPOSED WORK., Bidders are required to examine to their satisfaction, the plans and specifications and to make sure that the requirements are fully understood. They must satisfy themselves by actual examination of the site as to the nature of the work and all conditions affecting the performance of the contract.

20.4 PREPARING THE PROPOSAL., In preparing his proposal, the bidder shall specify the price, written legibly in ink or with the typewriter, at which he proposes to do each item of work. The price shall be stated in figures. In items where unit price is required, the total amount of each item shall be computed at the unit prices bid for the quantities given in the estimate. In case of errors in computing the total amount, the unit price will be assumed to be correct. A price shall be submitted for at least one type of construction and for all miscellaneous items.

20.5 SIGNATURES ON PROPOSALS., If the proposal is made by an individual, his name and post office address must be shown. If made by a firm or partnership, the name and post office address of the firm or partnership must be shown. If made by a corporation, the person signing the proposal must name the state under the law of which the corporation is chartered, and the name, title, and

business address of the executive head of the corporation. Anyone signing a proposal as agent may be required to submit satisfactory evidence of his authority to do so.

20.6 IRREGULAR PROPOSAL PROHIBITED Any changes or alterations made in the official proposal forms, or any additions thereto, may cause the rejection of the bid. No bid will be considered which contains a clause in which the Contractor reserves the right to accept or reject a contract awarded him by the Council. Proposals in which the unit prices are obviously unbalanced may be rejected.

20.7 PROPOSAL GUARANTY Each proposal shall be accompanied by a certified check drawn on a known responsible bank in the State of Iowa for the amount specified in the proposal form and made payable to the Treasurer of the City. Should the bidder receiving the award fail to execute a satisfactory contract and file an acceptable contract bond within ten (10) days after the acceptance of his proposal, this check shall be cashed and the full amount retained by the City as fixed and liquidated damages.

A certified check to be acceptable shall bear on its face the endorsement of a solvent bank as to the amount certified, which endorsement shall be signed by an official authorized to bind the bank by its acts.

20.8 DELIVERY OF PROPOSAL Proposals shall be placed in an envelope and the envelope sealed and marked to indicate its contents, and be accompanied by a certified check in a separate envelope, properly endorsed. If forwarded by mail, the two envelopes shall be placed in a third and mailed to the Clerk at his office before the time specified for closing bids.

20.9 WITHDRAWAL OF PROPOSAL Bidders shall be permitted to withdraw their proposals after the same have been filed with the Clerk, if request is made in writing to the Clerk, before the time specified for closing of bids. No proposal may be withdrawn for a period of thirty days (30) after the date set for the opening of bids.

20.10 OPENING PROPOSALS Bids will be publicly opened at the time and place announced in the official publication, and will be immediately read and recorded. Award will be as soon thereafter as practicable.

20.11 DISQUALIFICATION OF BIDDER No bidder shall submit more than one proposal. Reasonable grounds for believing that any bidder is interested in more than one proposal for the work may cause the rejection of all proposals in which such bidder is interested, or may cause the disapproval of any contract awarded such bidder. The attention of bidders is directed to Chapter 553, Code of Iowa, regarding unlawful combinations in making public contracts.

20.12 COMPETENCY OF BIDDER Bidders must be capable of performing the work bid upon. They may be required to supply a detailed statement covering experience on similar work, list of machinery, plant and other equipment which will be used on the proposed work, and such statements of their financial resources as may be deemed necessary.

SECTION 30. AWARD AND EXECUTION OF CONTRACT

30.1 CONSIDERATION OF BIDS The City reserves the right to waive defects and to reject any or all proposals.

30.2 AWARD OF CONTRACTS Contracts will be awarded at the time and place indicated in the notice to bidders, or if deemed advisable, at a time and place to be fixed by the Council at the time of opening proposals.

30.3 QUALIFICATIONS OF FOREIGN CORPORATIONS., Corporations organized under the laws of any other State shall file with the Clerk a certificate from the Secretary of the State of Iowa showing that they have complied with all the provisions of partnerships of other states and shall file with the Clerk an agreement consenting to the jurisdiction of the Courts of the county in which the project is located as provided in Chapter 616 of the Code of Iowa for all matters arising out of or connected with any contract entered into. Such certificates or agreements shall be on file with the Clerk, before any contract awarded hereunder shall be effective.

30.4 RETURN OF PROPOSAL GUARANTY,, The proposal guaranty of unsuccessful bidders will be returned promptly after the award has been made. In no case will the proposal guaranty be held longer than thirty (30) days without Written permission of the bidder, except that the proposal guaranty of the bidder to whom the contract is awarded will be retained until he has entered into contract and filed an acceptable bond.

30.5 CONTRACT BOND., The bidder to whom the contract is awarded will be required to file a surety bond in a sum equal to the amount the City is obligated to pay upon the completion of the contract, which bond shall be in a form complying with the laws of Iowa relating thereto, and shall be conditioned upon the completion of the contract in accordance with the specifications. When required by law, or by the specification, this bond shall include a clause guaranteeing maintenance of the work for the period stipulated.

30.6 EXECUTION OF CONTRACT., The bidder to whom the contract has been awarded shall enter into contract with the City within ten (10) days after the award has been made. No proposal shall be considered binding upon the City, until the Contract is properly executed by both parties and the contract bond filed with the Clerk, and approved by the Council.

30.7 FAILURE TO EXECUTE CONTRACT., Failure to file bond in the sum specified, or to execute the contract within ten (10) days, from contract awarding shall be just cause for the annulment of the award, or of the contract if executed, and it is understood by the bidder that in the event of the annulment of the award or of the contract, the amount of the proposal guaranty shall be retained by the City, as fixed and liquidated damages sustained by the City, due to the delay and failure of the bidder to enter into contract.

30.8 PREFERENCE FOR IOWA PRODUCTS., By virtue of statutory authority, a preference will be given to products and provisions grown or produced within the State of Iowa and to Iowa domestic labor.

SECTION 40. SCOPE OF THE WORK

40.1 INTENT OF THE PLANS AND SPECIFICATIONS., The true intent of the plans and specifications is to provide for the construction and completion of every detail of the improvement included in the contract, and it is understood that the Contractor for all or any part thereof will furnish all labor, materials, tools, transportation and supplies and to execute the contract in a satisfactory and workmanlike manner and in accordance with the plans, specifications, and terms of the contract.

40.2 INCREASED OR DECREASED QUANTITIES., The right is reserved, without impairing the contract, to order the performance of such work of a class not contemplated in the proposal or to increase or decrease the quantities as may be considered necessary to complete fully and satisfactorily the work included in the contract. However, when the work is completed without change in the plans and the resultant quantities of the various classes of work vary by more than twenty per cent (20%) from the estimated quantities specified in the contract, an adjustment in prices

for such classes of work may be made by agreement between the Engineers and the Contractor subject to the approval of the Council. Either party to the contract may request such an adjustment.

40.3 CLOSING STREETS TO TRAFFIC., The Contractor is hereby given authority to close streets, or parts of streets to vehicle traffic. The streets or parts of streets are to remain closed as long as the construction work or the condition of the finished work requires. The Engineers shall be the judges of how many streets or parts of streets it is necessary for the Contractor to close at any time and may refuse to permit the closing of additional streets until such of the work is finished and opened to traffic, as they may direct.

40.4 FINAL CLEANING UP., The Contractor shall remove all excavated material, rubbish or other surplus material from the site of the work, replace or renew fences, sidewalks, or other property damaged or disturbed by his work, and leave the premises in a condition satisfactory to the Engineers.

SECTION 50. CONTROL OF MATERIALS AND WORK

50.1 SUPERVISION AND INSPECTION., The Engineers shall have supervision of the construction provided for in this contract and shall decide any and all questions which may arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress on the work and all questions as to the acceptable fulfillment of the terms of the contract. Materials and construction work shall at all times be subject to the inspection of the Engineers or their representatives, and the Contractor to be held strictly to the true intent of these specifications as regards quality of materials, workmanship and the diligent prosecution of the work.

50.2 ALTERATION OR CORRECTION OF THE PLANS., The plans are made up from surveys that are presumably correct, and represent the forseen construction requirements. Any modification of the plans which may be required by the exigencies of the construction, or any corrections made necessary because of errors in the original surveys, will be made by the Engineers. Should corrections or modifications of the plans or specifications require a different quality or class of work than that upon which the unit prices in the proposal are based, or if modifications or corrections are required in parts of the work partially completed and such modifications result in an increased cost to the Contractor, the amount to be paid for work resulting from such changes shall be agreed upon in writing at the time the changes are ordered and before the work is begun by the Contractor. No allowance will be made for anticipated profits on work not performed.

50.3 DEVIATION FROM PLANS., No deviation from plans and specifications will be permitted without the written consent of the Engineers.

50.4 AUTHORITY AND DUTIES OF INSPECTORS., Inspectors may be stationed on the work to report to the Engineers as to the progress of the work, manner in which it is being performed, also to report whenever it appears that materials furnished and work performed by the Contractor fails to fulfill the requirements of the specifications and contract, and to direct the attention of the Contractor to such failure or infringement, but such inspection shall not relieve the Contractor from any obligations to furnish acceptable materials or to provide completed construction that is satisfactory in every particular.

In case of any dispute arising between the Inspector and the Contractor as to material furnished or the manner of performing the work, the inspector shall have the authority to reject materials or suspend the work until the question at issue can be referred to and decided by the Engineers. Inspectors are not authorized to revoke, alter, enlarge, relax or release any requirements of these specifications,

nor to issue instruction contrary to the plans and specifications. The Inspector shall in no case act as foreman or perform other duties for the Contractor, or interfere with management of the work by the latter.

50.5 REMOVAL OF UNAUTHORIZED AND DEFECTIVE WORK., Work done without lines and grade being given, work done beyond lines shown on the plans or as given, except as herein provided, or any extra or additional work done without authority will be considered as unauthorized and at the expense of the Contractor and will not be paid for under the provisions of the Contract. Work so done may be ordered removed and replaced at the Contractor's expense. Any work which fails to meet the requirements of the plans and specifications shall be removed and replaced at the Contractor's expense.

50.6 ENGINEER'S STAKES., The Engineers shall set the necessary line and grade stakes promptly upon notification by the Contractor that stakes are needed. When so requested, the Contractor shall furnish the necessary laborers to assist in setting the stakes. The City will not be responsible for delays due to lack of grade or line stakes unless the Contractor shall have given the Engineers twenty-four (24) hours notice in writing that such stakes are needed.

50.7 MATERIAL SAMPLES., Before a contract is awarded, the bidder may be required to furnish a statement of the origin, composition and manufacture of any or all materials proposed for use in the performance of the Contract, together with samples of the material. These samples will be considered as representative and typical of the material to be obtained from any particular source.

50.8 SPECIFICATIONS REFERRED TO., Specifications referred to on the plans and in these specifications are as much a part of these documents as though set forth herein verbatim and it is the responsibility of the Contractor that he know and understand the specifications referred to in order that the work described shall be fully and completely constructed as intended by the plans and specifications.

SECTION 60. LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

60.1 LAWS RELATING TO WORK., The Contractor is presumed to be familiar with all laws, ordinances, and regulations which may in any manner affect those engaged or employed upon the work or the materials or equipment used in or upon the work and shall conduct the work so as not to conflict with such laws, ordinances and regulations.

60.2 PROTECTION OF WORK AND ADJOINING PROPERTY., The Contractor for any part of the improvement shall be held responsible for the care of materials and of partially completed and completed work, until final acceptance of the same by the Council. He will be required to make good at his own expense any damage which the work may sustain from any cause prior to the filing of the Engineer's certificate of completion. He shall take all risk from floods and casualties of every description and make no charge for delay due to such cause. He may, however, be allowed a reasonable extension of time on account of such delays. He shall correct or make good at his own expense all damages to adjacent property due to the acts or negligence of his employees or the prosecution of his work and save the City harmless therefrom.

60.3 RESPONSIBILITY FOR ACCIDENTS., The Contractor shall assume full responsibility for all damages sutained by persons or property due to the carrying on of his work, and until final acceptance thereof or until released by the Engineers in writing.

60.4 LIABILITY INSURANCE., The Contractor shall carry liability insurance which

shall save harmless the City and protect the public and any person from injury sustained by the reason of the prosecution of the work or the handling or storing of materials therefor, and said contractor shall also carry liability insurance which shall meet the requirements of the Iowa Workmen's Compensation Law.

Prior to the payment of any estimate earned under a contract awarded under these specifications, the Contractor shall furnish the Clerk with proper affidavit or affidavits executed by representatives of duly qualified insurance companies, evidencing that said insurance company or companies have issued liability insurance policies effective during the life of the contract or for a period of at least ten (10) days following the filing or written notice of cancellation, protecting the public and any person from injuries or damage sustained by reason of carrying on the work involved in the Contract. The affidavit shall specifically evidence the following forms of insurance protection:

(1) Public liability insurance covering all operations performed by persons directly employed by the Contractor.
(2) Public liability insurance covering all operations performed by any subcontractor to whom a portion of the work may have been assigned.
(3) Public liability insurance covering all work upon the project performed by any independent contractor working under the direction of either the principal contractor or a subcontractor.
(4) Motor vehicle bodily injury liability insurance and property damage liability insurance on all motor vehicles employed on the work, whether owned by the Contractor or by other persons, firms, or corporations.

The minimum protection shall be as follows:

Public Liability Insurance - - - - - - - - - -	$25,000 Per person
	50,000 Per accident
Motor Vehicle Bodily Injury Liability Insurance -	25,000 Per person
	50,000 Per accident
Property Damage - - - - - - - - - - - - - - - -	10,000 Per accident

60.5 MAINTENANCE OF BARRICADES AND LIGHTS,, The Contractor shall at his own expense and without further or other order provided, erect and maintain at all times during the progress and suspension of the work and until completion and final acceptance thereof, suitable and requisite barriers, signs, and other adequate protection and shall provide, keep, and maintain such red lights, danger signals, or watchmen as may be necessary or as may be ordered by the Engineers to insure the safety of the public as well as those engaged on the work. All barricades and obstructions shall be protected at night by red signal lights which lights shall be burning from sunset to sunrise. Barricades and obstructions shall be of substantial construction and shall preferably be painted white to increase their visibility at night.

60.6 PATENTS., The Contractor shall indemnify and save harmless the property owner and the City against all claims arising from alleged infringements of any patents and the payment of all royalty covering tools, machinery, processes, appliances, devices or materials used in connection with the work, and the Council may retain out of the moneys which may be due, or become due, the Contractor a sum sufficient to cover all such claims, and retain the same until the claims are paid or satisfactorily adjusted by the Contractor or his surety.

60.8 CLAIMS AGAINST CONTRACTOR., The Contractor shall be held for the payment of all just claims against him arising out of the prosecution of this contract, and

his bond will not be released until such claims are paid or dismissed.

60.9 PERSONAL LIABILITY OF PUBLIC OFFICIALS AND/OR ENGINEERS., In carrying out any of the provisions of the contract or in exercising any power or authority granted him thereby, there shall be no liability upon the Engineers or their authorized assistants either personally or as an official of the City, it being understood that in such matters he acts as the agent and representative of the City.

60.10 JURISDICTION., Any action in court against the contractor or sureties on his bond because of damages to property or individuals by said Contractor or his workmen, or because of the violation of any provisions of the specifications, or an account of the failure of said Contractor to fully comply with these provisions, shall be brought in the District Court of the State of Iowa having jurisdiction over the county in which the project is located.

60.11 NO WAIVER OF LEGAL RIGHTS., The City shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the work and payments therefor, from showing the true amount and character of the work performed and materials furnished by the Contractor, or from showing that any such measurement estimate, or certificate is untrue or incorrectly made, or that the work or materials do not in fact conform to the Contract. The City shall not be precluded or estopped not withstanding any such measurement, estimate or certificate and payment in accordance therewith, from recovering from the Contractor and his surety, such damages as it may sustain by reason of this failure to comply with the terms of the Contract. Neither the acceptance by the City or any of its representatives, nor any payment for or acceptance of the whole or any part of the work, nor any extension of time, nor any possession taken by the City, shall operate as a waiver on any portion of the contract or of any power herein reserved, or any right to damages herein provided. A waiver of any breach of the contract shall not be held to be a waiver of any other or subsequent breach.

SECTION 70. PROSECUTION AND PROGRESS

70.1 ASSIGNMENT OF CONTRACT., The Contractor shall not sell or assign the contract or sublet any portion of the work provided for therein without the written consent of the Council.

70.2 ORDER OF CONSTRUCTION., The Engineers shall have control of the order in which the various parts of the improvement are to be performed. The order of improvement as determined by the Contractor will be followed except where the Engineers determine that such order would not be to the best interests of the general public.

70.3 PROGRESS OF THE WORK., The Contractor shall at all times have a competent superintendent as his agent on the work, who shall receive instructions from the Engineers, and as large a force of workmen as is necessary to prosecute the work with diligence. The progress of the work shall be such that at the expiration of one-fourth of the contract period, one-eighth of the work shall be completed; at the expiration of one-half of the contract period, three-eighths of the work shall be completed; at the expiration of three-fourths of the contract period, the work shall be three-fourths completed; and the whole work shall be completed at the end of the contract period.

If at any time the above schedule is not being maintained, the Council may give written notice to the Contractor, and his sureties that the specifications are not being complied with. Such notice shall state what action on the part of the Contractor is required to bring the work within the requirements of the

specifications. If the Contractor fails within ten (10) days to proceed as directed in the said notice, then the Council shall have authority to annul this contract without process or action at law and take over the prosecution and completion of the work, to use equipment or materials already delivered and to subject or otherwise provide for the completion of the work in the specified manner. Neither the Council nor any member or employee thereof shall be liable or accountable to the Contractor or his surety for the manner in which or the price at which the said work or any portion thereof, may have been or may be done.

All the costs incurred in completing the work or performing anew such work as has been rejected as defective or unsuitable shall be deducted from any moneys due, or becoming due, the Contractor, and in case the expense of completing the work as above provided shall be less than the sum that would have been due the Contractor if he had completed the work himself, he shall be paid the difference and if the expense so incurred is greater than would have been the case under the terms of the contract, the Contractor and his surety shall be liable for the difference.

70.4 WEATHER During stormy or inclement weather, all work shall be suspended except such as can be done in an acceptable manner. Permission to work during freezing, stormy or inclement weather, shall in no wise be construed as a release of the Contractor's responsibility regarding the quality of the finished work at such time.

70.5 SUNDAYS AND LEGAL HOLIDAYS Except for such work as may be required to properly maintain or protect completed or partially completed construction or to maintain lights and barricades, no work will be permitted on Sundays or legal holidays without specific permission of the Engineers.

70.6 CHARACTER OF WORKMEN AND EQUIPMENT The Contractor shall employ competent and efficient workmen for every kind of work. Any person employed on the work, who shall refuse or neglect to obey the directions of the Engineers or Inspector, or who shall be deemed incompetent or disorderly, or who shall commit trespass upon public or private property in the vicinity of the work, shall be dismissed when the Engineers so order, and shall not be reemployed unless express permission be given by the Engineers.

The methods equipment and appliances used on the work and labor employed shall be such as will produce satisfactory quality of work and shall be adequate to complete the contract within the specified time limit.

70.7 TEMPORARY SUSPENSION OF THE WORK The Engineer shall have authority to suspend the work wholly or in part, for such period or periods of time as he may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for the suitable prosecution of the work or for such time as is necessary due to the failure of the Contractor to carry out orders given or to perform any or all provisions of the contract.

70.8 ENGINEERING COSTS AFTER OFFICIAL DATE OF COMPLETION Should the Contractor fail to complete the improvement within the time specified, he shall reimburse the City for any extra Engineering Costs necessitated by the continuance of the work beyond the time specified for completion. The Contractor may require the City to submit vouchers or payrolls in support of claims for such extra compensations.

70.9 LIQUIDATED DAMAGES - CONTRACTS NOT COMPLETED WITHIN CONTRACT PERIOD., Time is an essential element of the contract and it is important that the work be pressed vigorously to completion. The date of commencement and the date of completion of the work included in the contract will be fixed by the Council and set forth in the contract documents, and will be known as the "Contract Period".

For each calendar day that any work shall remain uncompleted after the end of the contract period, the amount per calendar day specified in the proposal form, shall be deducted from any money due the contractor, not as a penalty, but as predetermined and agreed liquidated damages. Due account shall be taken of any adjustment of the contract period subsequent to the letting of the contract for good and sufficient reasons approved by the Council.

The assessment of liquidated damages for failure to complete the work within the contract period shall not constitute a waiver of the City's right to collect additional damages which the City might sustain by failure of the Contractor to carry out the terms of his contract.

70.10 TERMINATION OF RESPONSIBILITY., The contract shall be considered as completed and the Contractor released from further obligations, except as to the requirements of his bond, after the work has been completed and finally accepted and final estimates have been allowed and the final report of the Engineers has been filed with and approved by the Council.

SECTION 80. MEASUREMENT AND PAYMENT

80.1 STANDARDS OF MEASUREMENTS., All work completed under the contract shall be measured by the Engineers according to the United States standard measures.

80.2 SCOPE OF PAYMENT., The Engineer's measurements of quantities shall be the basis for final payment for the work performed under this contract. After the work is completed, the Engineers will make measurements and computations of the number of units of each of the various items of work performed at the rates specified by his proposal. Before final settlement is made, the Council may require the Contractor to submit a list of all persons furnishing labor or materials, with evidence that such persons have been paid in full. Should reasonable doubt arise as to the integrity of any part of the completed work the payment on that portion of the work will be withheld until the cause for such doubt has been removed. Payment shall be made in the manner set forth in the official publications relating thereto.

If the work extends over a period of more than one month, and is to be paid for from other than special assessment funds, the Contractor will be paid monthly estimates based upon the amount of acceptable work completed or materials delivered. Ten per cent (10%) of each estimate shall be deducted and held as suspended payment until final acceptance of the entire contract. Final payment will be made promptly following the expiration of the statutory time for filing claims or following adjudication or release of claims.

The time and method of payment for work to be paid for from special assessment funds will be set forth in the special provisions.

80.3 CITY WATER The Contractor will be allowed to use City water, but before any water is used, he shall make application to the Engineers who will provide and install suitable meters and supply the Contractor's representative with suitable hydrant wrenches when the use of hydrants is necessary. The Contractor shall designate one of his employees who shall be responsible for operating the hydrants used by the Contractor. The employee so designated shall be under the direct supervision of the Engineers and no other employee may operate any hydrant or valve without the written permission of the Engineers. The meters shall not be moved by the Contractor, but will be moved by City employees as directed by the Contractor. The water used will be charged to the Contractor at the rate of _____ per 1,000 gallons.

80.4 EXTRA WORK Such extra work as may be ordered by the Engineers shall be done by the Contractor, and he shall be compensated as provided herein. If work is to be done or materials are to be furnished by the Contractor, which cannot properly be classified under unit prices included in the proposal, the Contractor shall be paid therefor the actual reasonable cost of the labor and materials entering permanently in such work plus fifteen per cent (15%) of the cost thereof. In computing the labor cost on such extra work the following items shall be included.

(a) Actual pay roll expenditures for labor at the current rate therefor and cost of materials.

(b) Pay of foreman and timekeepers for actual time required on the extra work.

(c) Liability insurance prorated for the extra work.

Labor cost items on extra work shall be furnished in duplicate by the Contractor to the Inspector daily. The Inspector shall check the items and if he finds them to be correct, he shall so certify on the statement of cost returning one copy to the Contractor and filing one copy with the Engineers.

The Engineers shall determine the cost of materials entering into the extra work, from the materials and receipted freight bills for the same.

For any special machine power, tools, or equipment including fuel and lubricants but not including small hand tools, which may be deemed necessary or desirable to use, the Contractor shall be allowed a reasonable rental thereon to be agreed upon in writing by the Engineers before the work is begun and to which sum no percentage is to be added.

The item of cost shall not include repairs or replacement of equipment or overhead expenses of any character. The fifteen per cent (15%) allowed is considered to cover the use of hand tools and all overhead expenses except liability insurance.

In no case will a claim for extra compensation be allowed unless the work upon which the claim is based has been ordered in writing, except as provided hereinafter.

80.5 CLAIMS FOR EXTRA COMPENSATION If the Contractor deems that extra compensation is due him for work or material that he considers is not clearly covered in the items for which he submitted unit prices in his bid, and that were not ordered in writing by the Engineers as an extra as heretofore provided, the Contractor shall notify the Engineers in writing of his intention to make claim for extra compensation for work before he begins the work. If such written notification is not given, or the Engineer is not afforded proper facilities by the Contractor for keeping strict account of actual cost as defined herein, then the Contractor hereby agrees to waive the claim for extra compensation. Such notice to the Engineers, and the fact that the Engineers have kept account of cost as aforesaid, shall not in any way be construed as proving the validity of the claim, which must be passed upon by the Council. In case the Council finds the claim to be just, it shall be allowed and paid for as extra work as provided herein.

80.6 IOWA SALES TAX - FILING OF FORM Before final payment is made on contracts awarded by the City, the Principal Contractors and Sub-Contractors shall file on forms supplied by the City the amounts of Iowa Sales Tax and Use Tax paid on materials and supplies actually used upon or incorporated into projects let by the City.

These forms shall be submitted in five copies to the Engineer in charge of the project upon completion of the contract.

STANDARD SPECIFICATIONS FOR DEEP WELLS

Section 1-1--General

Section 1-1.1--Scope of Work

The work to be done hereunder includes the furnishing of all labor, material, transportation, tools, supplies, plant, equipment and appurtenances, unless hereinafter specifically excepted, necessary for the complete satisfactory construction, disinfection and testing of the proposed water supply well described under Section 1-1.7.

Section 1-1.2--Permits, Certificates, Laws and Ordinances

The contractor shall, at his own expense, procure all permits, certificates and licenses required of him by law for the execution of his work. He shall comply with all federal, state or local laws, ordinances or rules and regulations relating to the performance of the work.

Section 1-1.3--Location

The well to be constructed hereunder is to be located as shown by the attached plans.

Section 1-1.4--Local Conditions

Information regarding test wells, existing nearby wells, availability of power, unusual conditions affecting work, etc., is attached hereto or in the Plans. This information regarding sub-surface conditions is intended to assist the contractor in preparing the contractor's bid. However, the city does not guarantee its accuracy, nor that it is necessarily indicative of conditions to be encountered in sinking the well to be constructed hereunder, and the contractor shall satisfy himself regarding all local conditions affecting his work by personal investigation and neither the information contained in this section nor that derived from maps or plans, or from the city or the city's agents or employees shall act to relieve the contractor from any responsibility hereunder or from fulfilling any and all of the terms and requirements of the contract.

Section 1-1.5--Boundaries of Work

The city shall provide land or right-of-way for the work specified in this contract and make suitable provisions for ingress and egress, and the contractor shall not enter on or occupy with men, tools, equipment or material, any ground outside the property of the city without

the written consent of the owner of such ground. Other contractors and employees or agents of the city may for all necessary purposes enter upon the work and premises used by the contractor, and the contractor shall conduct his work so as not to impede unnecessarily any work being done by others on or adjacent to the site.

Section 1-1.6--Protection of Site

Excepting as otherwise provided herein, the contractor shall protect all structures, walks, pipelines, trees, shrubbery, lawns, etc., during the progress of his work; shall remove from the site all cuttings, drillings, debris and unused materials; and shall, upon completion of the work, restore the site as nearly as possible to its original condition, including the replacement, at the contractor's sole expense, of any facility or landscaping which has been damaged beyond restoration to its original condition or destroyed. Water pumped from the well shall be conducted to a place where it will be possible to dispose of the water without damage to property or the creation of a nuisance. Points of disposal for water are shown in these specifications or on the attached plans.

Section 1-1.7--General Description of Well

The completed well is to consist of the principal items specified in the Special Provisions.

Section 1-1.8--Facilities or Material to Be Furnished By City

The city shall furnish to the contractor at the site of the work free of cost the items indicated in the Special Provisions.

Section 1-1.9--Competent Workmen

The contractor shall employ only competent workmen for the execution of his work and all such work shall be performed under the direct supervision of an experienced well driller satisfactory to the engineers.

Section 1-2--Casings and Well Screens

Section 1-2.1--Casings

Casings to be used hereunder as a part of the permanent well shall be of new material having minimum weights and dimensions as reflected by the Special Provisions. Casing shall be provided with drive shoes of approved type. Casings shall have screwed joints.

Section 1-2.2--Well Screens

Well screens will be used in unconsolidated formations only. The minimum nominal diameter and minimum length of screen, the type of metal,

the type of screen, the screen openings and the number in area of openings, the strength of the screen and fittings shall be as prescribed in the attached Special Provisions.

Section 1-3--Description of Work

See Special Provisions for this information and instruction.

Section 1-4--Testing for Yield and Drawdown

Section 1-4.1--Time of Test

After the well has been completely constructed and cleaned out and the depth of the well accurately measured, the contractor shall notify the engineer to that effect and shall make the necessary arrangements for conducting a final pumping test. Besides this final test the engineer may order the contractor to make such additional pumping tests during and after construction as he deems necessary. All tests shall be run with similar equipment and in a like manner to that hereinafter described.

Section 1-4.2--Test Pump

The contractor shall furnish and install necessary pumping equipment capable of pumping to the required point of discharge a maximum gallons per minute at a pumping level below ground but with satisfactory throttling devices so that the discharge may be reduced all as specified in the attached Special Provisions.

The pumping unit shall be complete with prime mover of ample power, controls and appurtenances and shall be capable of operating without interruption for a period of hours as specified in the Special Provisions.

Section 1-4.3--Auxiliary Equipment

The contractor shall furnish all necessary discharge piping for the pumping unit, which shall be of sufficient size and length to conduct the water being pumped to the discharge point as shown by the attached plat or plans. The contractor shall also furnish, install and maintain equipment of approved size and type for measuring the flow of water; such equipment to be a weir box, orifice or water meter. To measure the elevation of the water level in the well, an air line complete with gage, hand pump and check valve shall be provided. Unless otherwise permitted, the air line shall be securely fastened to the pumping unit and shall terminate approximately at the maximum desired pumping level stated in the Special Provisions but shall in no case be nearer than 2 feet to the end of the suction pipe.

Section 1-4.4--Duration of Test

Except as otherwise provided, the contractor shall furnish all labor, motive power, lubricating oil and other necessary materials, equipment, labor and supplies required and shall operate the pumping unit at such rates of discharge and for such periods of time as directed, excepting that the final test shall be run for the period specified in the Special Provisions. Accidental interruptions may, if so agreed upon between the contractor and the engineer, be compensated for by correspondingly extending the time of the completion of the test run. After the completion of the final test, the contractor shall remove by bailing, sand pumping or other methods any sand, stones or other foreign material that may have become deposited in the well. Time stated for the duration of the final test is a minimum only and the engineer reserves the right to require the contractor to extend such period of test, or to make additional tests.

Section 1-5--Grouting and Sealing

Section 1-5.1--Grouting Material

The annular space between the inner or protective casing and the outer casing or hole shall be filled with cement grout. Grout shall be proportioned of cement and the minimum quantity of water (not over 6 gal. per cu. ft. of cement) required to give a mixture of such consistency that it can be forced through out the grout pipes. The mixture, method of mixing and consistency of grout shall be approved by the engineer.

Section 1-5.2--Placement of Grout

Before proceeding with the placing of grout the contractor shall secure the engineer's approval of the method he proposes to use. No method will be approved that does not specify the forcing of grout from the bottom of the space to be grouted towards the surface. A suitable cement retainer, packer or plug shall be provided at the bottom of the inner casing so that the grout will not leak through into the bottom of the well. The grouting shall be done continuously and in such a manner as will insure the entire filling of the annular space in one operation. No drilling operations or other work in the well will be permitted within 72 hours after the grouting of casings. If quick-setting cement is used this period may be reduced to 24 hours.

Section 1-5.3--Grouting Liners

Where required by the engineer, liners may be grouted. The method to be used shall be detailed by the contractor for the approval of the engineers.

Section 1-6--Testing for Plumbness and Alignment

Section 1-6.1--Requirement to Test

All holes shall be constructed and all casings and liners set round, plumb and true to line as defined herein. To demonstrate the compliance of his work with this requirement the contractor shall furnish all labor, tools, and equipment and shall make the tests described herein in the manner prescribed by, and to the satisfaction of, the engineer. Tests for plumbness and alignment must be made after the complete construction of the well and before its acceptance. Additional tests, however, may be made by the contractor during the performance of the work. No specific payments shall be made by the city for making these tests.

Section 1-6.2--Description of Test

Plumbness and alignment shall be tested by lowering into the well to a depth equal to the lowest anticipated pump setting a section of pipe 40 feet, long or a dummy of the same length. The outer diameter of the plumb shall not be more than $\frac{1}{2}$ inch smaller than the diameter of that part of the casing or hole being tested. If a dummy is used it shall consist of a rigid spindle with three rings, each ring being 12 inches wide. The rings shall be truly cylindrical and shall be spaced one at each end of the dummy and one ring in the center thereof. The central member of the dummy shall be rigid so that it will maintain the alignment of the axes of the rings.

Section 1-6.3--Requirements for Plumbness and Alignment

Should the dummy fail to move freely throughout the length of the casing or hole to a depth equivalent to the lowest anticipated pump setting or should the well vary from the vertical in excess of two-thirds the smallest inside diameter of that part of the well being tested per 100 feet of depth, or beyond limitations of this test, the plumbness and alignment of the well shall be corrected by the contractor at his own expense and, shall he fail to correct such faulty alignment or plumbness, the engineer may refuse to accept the well. The engineer may waive the requirements of this paragraph for plumbness if, in his judgment, (a) the contractor has exercised all possible care in constructing the well and the defect is due to circumstances beyond his control; (b) the utility of the completed well will not be materially affected; (c) the cost of necessary remedial measures will be excessive. In no event will the provisions of this paragraph with respect to alignment be waived.

Section 1-7--Disinfection

Section 1-7.1--Time of Disinfection

After the well has been completely constructed, it shall be throughly cleaned of all foreign substances, including tools, timbers, rope, debris of any kind, cement, oil, grease, joint dope and scum. The casing pipe shall be thoroughly swabbed, using alkalis if necessary, to remove oil, grease, or joint dope. The well shall then be disinfected with a chlorine solution.

Section 1-7.2--Chlorine Solution

The chlorine solution used for disinfecting the well shall be of such volume and strength and shall be so applied that a concentration of at least 50 ppm. of chlorine shall be obtained in all parts of the well. Chlorine solution shall be prepared and applied in accordance with the directions of, and to the satisfaction of, the engineer, and shall remain in the well for a period of at least two hours.

Section 1-7.3--Requirements for Disinfection of Test Pump

In the event that the test pump is installed after the well has been disinfected, all exterior parts of the test pump coming in contact with the water shall be dusted with a chlorine compound as directed by the engineer.

Section 1-8--Samples and Records

Section 1-8.1--Samples of Formations

The contractor shall keep an accurate record of the location of the top and bottom of each stratum penetrated and shall save and deliver to the engineer and to the Iowa Geological Survey, Geology Annex, Iowa City, Iowa, samples of the material taken from each 5 (10) (20) feet of drilling and at every change of formation.

Section 1-8.2--Record of Casing Pipe

The contractor shall keep an accurate record as assembled of the order, number, size and lengths of the individual pieces of pipe installed in the well.

Section 1-8.3--Liquidated Damages

Failure on the part of the contractor to obtain, preserve and deliver such samples or records to the engineer and to the Iowa Geological Survey shall be considered an actual damage to the city and

shall authorize the city to retain from moneys due or to become due the contract the sum of _____ dollars as liquidated damages for each sample that the contractor shall fail to obtain, preserve and deliver, or for each length of pipe not properly measured and recorded in the order in which it was placed in the well. In the event that, in the opinion of the engineer, the failure of the contractor to take and preserve the samples may affect the proper design of the screen, the contractor may be required to perform such work as the engineer deems necessary to remedy such failure. (The last sentence relates to unconsolidated formations only.)

Section 1-8.4--Daily Reports

The contractor shall also submit a daily report describing the nature of material encountered, the work done during each day, including the items of work accomplished, such as depth drilled, casing set, etc., the water level in the well at the beginning and end of each shift and such other pertinent data as he is requested to make a record of by the engineer. A sample form of the daily report is a part of the specifications.

Section 1-9--Protection of Quality of Water

Section 1-9.1--Precautions to be Taken

The contractor shall take such precautions as are necessary or as may be required permanently to prevent contaminated water or water having undesirable physical or chemical characteristics from entering, through the opening made by the contractor in drilling the well, stratum from which the well is to draw its supply. He shall also take all necessary precautions during the construction period to prevent contaminated water, gasoline, etc., from entering the well either through the opening or by seepage through the ground surface.

Section 1-9.2--Corrective Work

In the event that the well becomes contaminated or that water having undesirable physical or chemical characteristics does enter the well due to the neglect of the contractor, he shall, at his own expense, perform such work or supply such casings, seals, sterilizing agents or other material as may be necessary to eliminate the contamination or shut off the undesirable water.

Section 1-9.3--Freedom From Sand and Turbidity

The contractor shall exercise extreme care in the performance of his work in order to prevent the breakdown or caving in of strata overlying that from which the water is to be drawn. He shall develop,

pump or bail the well by such methods as may be approved by the engineer until the water pumped from the well shall be substantially free from sand and until the turbidity is less than 5 on the silica scale described in Standard Methods of Water Analysis.

Section 1-10--Temporary Capping

At all times during the progress of the work, the contractor shall protect the well in such manner as will effectively prevent either tampering with the well or the entrance of foreign matter into it, and, upon its completion, he will provide and set a substantial screwed, flanged or welded cap satisfactory to the engineer.

Section 1-11--Abandonment of Well

In the event that the contractor shall fail to sink the well to the depth specified or to such lesser depth as ordered by the engineer, or should he abandon the well because of loss of tools or for any other cause, he shall, if requested and as directed by the engineer, fill the abandoned hole with clay or clay and concrete and remove the casing. Salvaged material furnished by the contractor shall remain his property.

Section 1-12--Measurement and Compensation

The contractor is referred to the Standard General Specifications and to the Special Provisions and to the other allied papers concerning measurement and compensation.

CONTRACTOR'S DAILY REPORT
(To be made out in three copies) Form No. 320

Contractor _____

Project _____ Date _____

	First Shift	Second Shift
Well depth - beginning	_____ ft.	_____ ft.
- end	_____ ft.	_____ ft.
Well diameter	_____ in.	_____ in.
Casing placed - diameter	_____ in.	_____ in.
- length	_____ ft.	_____ ft.
- type	_____	_____
Type of material being drilled	_____	_____
	_____	_____
Static water level	_____ ft.	_____ ft.
Cutting samples taken	No. _____	No. _____
	No. _____	No. _____
Grouting operation	_____	_____
No. of hours of drilling	_____	_____
Working hours	_____ m. to _____ m.	_____ m. to _____ m.

_____ Signature of driller

_____ Signature of driller

Comments: In the space provided below any special situations arising should be explained in detail. (Notations pertaining to tests conducted; notations on change of well or casing diameter; accidents of construction nature; accidents of liability nature; and any other additional information having a bearing upon the work, persons concerned with the work, time of occurrence, etc.)

_____

_____

_____

_____

_____

_____

_____

Daily Distribution: Original to Engineer, Rowat - Murray, Belmond
1 copy to Contractor
1 copy to IGS, Iowa City, Iowa

SPECIAL PROVISIONS

Description of Project

As reflected by the proposal form, drilling will be started with a 20 inch O.D. temporary steel casing set to an approximate depth of 30 feet. Drilling will then be continued inside this temporary casing with a hole of sufficient size to allow a minimum of 2" of grout outside of the 12" permanent casing which is to be set from 2' above ground to approximately 140' below ground.

If caving material is encountered in the drift, the contractor shall set temporary casing of not less than 17" I.D. to assist in the drilling. Such temporary casing shall be set at the contractor's expense. It may be used casing of sufficient strength to accomplish the purpose for which intended and may be removed or left in place at the option of the contractor. If removed, such removal shall be accomplished in a manner which, to the satisfaction of the Engineer, shall not adversely effect the grouting of the permanent casing.

After setting the 12" casing, it shall be fully pressure grouted. When the neat cement grout has completely set, drilling operations will be continued inside the 12" casing to the top of the Sheffield Shale which is estimated to be at a depth of 230'.

Upon reaching the Sheffield Shale, the well will be developed and test pumped for yield and drawdown. A well with a minimum capacity of 400 gal/min is to be developed. The cost of disenfecting the well shall be included in the lump sum for setting up and removing the test pump.

In event sufficient water is not developed above the Sheffield Shale, drilling a 12" hole will continue through to the top of the Cedar Valley formation and a 10" casing set from 230' to the Cedar Valley formation which is expected at approximately elevation 330'. Drilling inside the 10" casing shall continue sufficiently far to develope the desired supply. The well will then be developed and test pumped again for yield and drawdown.

Well Casings

All permanent casings used shall comply with AWWA Specification for Deep Wells. They may have screwed or welded joints. A certified welder shall be used for all welded joints in the permanent casing.

Water and Drilling Samples

The Contractor shall take representative water samples each time a new acquifer is penetrated. The method of sampling shall be in accordance with recommendations of the Iowa Geological Survey. Samples of the formations shall be taken every five (5) feet as outlined in Section 1-8 of these specifications. Containers for the water samples and bags for the drilling samples will be furnished to the contractor. He shall record the pertinent data on each sample and send the samples to the Iowa Geological Survey, Iowa City without delay.

Miscellaneous

The City will arrange for disposal of the water and waste produced in the drilling and testing of the well and will furnish water required in the drilling operation.

The anticipated log of the well is indicated on the Contract Plan. This information is the best available on the logs and geological conditions near the site. The City believes that it will be possible to drill the size holes to the depths specified. However, the City does not in any way warrant the information on the geological conditions and no contractor is to rely on the above stated geological information for any part of his bid on said well.

At the contractor's discretion and with the approval of the City, work on this project may be carried on 24 hours per day excluding Sundays and holidays.

It is mutually understood that items not covered in these contract documents and plans and allied papers will be handled as specified by the American Water Works Association Standard Specifications for Deep Wells (AWWA A-100-52) and at prices mutually agreed upon in change orders by the City and by the contractor.

g-w file Wright County
G-D.

Memorandum

To: C.N. Brown

Oct. 23, 1957

From: P.J. Horick

Re: Information for Rosene of Rowat-Murray concerning Belmond - Meservey region geology and ground-water conditions

1) Show him Tester's geologic map and point out the strike and dip of the formations and the beveling.
2) Using the selected well logs from Wright, Hancock, Cerro Gordo, and Franklin counties point out the bedrock formations and the thickening of the Mississippian and Devonian strata from NE to SW, e.g., the Mississippian section is 30 feet thick at Meservey, 130 feet at Belmond, and 315 feet at Eagle Grove.
3) The Cedar Valley fm. is a good aquifer in the 4-county area mentioned, yielding moderate quantities of water to wells. Many wells in Hancock and Cerro Gordo counties obtain water from this formation. The new municipal wells at Garner and Thorton are good examples of the potential of the Cedar Valley fm. The yield probably can be increased by acidizing. Farther south in Hamilton and Hardin counties the Cedar Valley and underlying Wapsipinicon formation are

gypsum-bearing and the water developed is high in sulfates.

4) Southwest of a line extending between Meservey and through Corwith, Belmond, thence to and Hampton, the Mississippian rocks are the chief water beds. These strata also yield considerable amounts of water as indicated by the wells at Eagle Grove, Clarion, Rowan, Belmond, and Corwith.

5) Additional water yielding zones probably will occur in the Galena, St. Peter, Prairie du Chien, Jordan, and St. Lawrence fms. Wells penetrating the Jordan at Mason City and Hampton have been highly successful.

7) This office will be glad to summarize the g-w conditions at specific locations on request. The co-operation of Rowat-Murray Engineers in supplying us with data on well construction and water levels and pump tests is much appreciated.

6) Alluvial and glacial outwash sand and gravel deposits are another source of small to moderate water supplies in this part of Iowa.

KEA & SEH

Belmond (Wright Co.)

The following information obtained from Edward F. Bailey, WW Supt. and Miss Carrie Courtney, City Clerk: (about 1945-47)

Contract signed for deep well on November 12, 1910 and drilling commenced by December 1 or earlier.
Contractor was W. L. Thorne of Platteville, Wis.,
Total cost of well = $2209.35
Completed drilling in 1911 and well accepted by city council Feb. 15, 1911

On November 18, 1895 the Challenge Pump and Windmill Co. completed installation of water tower and the first mains at a cost of $8,645.00 (this company is from Batavia, Illinois)
In 1910 4½ miles of 4" mains were laid as extensions to the existing system and there have been several additions since.

Total cost of water system to date = $68,000.00

The well is reportedly about 600 feet deep. The S.W.L. at present is about 24-26 ft. below pump which is 10 ft. below land surface.
There is a Layne turbine pump, 20 H.P., installed in the well with about 30 ft. of column and about 20 ft. of tailpipe. The well is pumped at about 350 g.p.m. but some is returned to the well from the discharge of the pump and the total amount pumped for treatment and distribution is about 200 g.p.m.
Drawdown in he well is reportedly very slight.

The entire city water system is municipally owned.

Storage at present consists of a 70 ft. elevated tank, installed in 1926, and a surface reservoir providing a combined storage of 100,000 gallons. The tank maintains 42 lbs. of pressure.
There are over 5 miles of mains at present; about 1800 ft. of 8" and about 5000 ft. of 4", the rest being 6" presumably also 4".
There are 458 houses in town, 175 of which were not connected to the city supply in the fall of 1943 (present). These houses rely on private wells, seldom over 125 to 130 feet deep and usually very shallow (sand points, etc.).
There are 260 metered outlets and 53 hydrants.

The present water is quite high in iorn and is treated by a lime-alum process followed by sand filtration. Total daily pumpage is about 60,000 gallons.

Railroads use their own supply as follows:
C.R.I. & P.--buys from city
C. G. W. --uses Iowa River
M. & St.L.--shallow well of their own

Charges for water are madeas follows:
$0.45 per 1000 gals. for the first 45,000 gals. per three month period ($\frac{1}{4}$)
$0.35 per 1000 galls for the next 45,000 gals. per three month period ($\frac{1}{4}$)
$0.25 per 1000 gals. for all over 90,000 gals. per three month period ($\frac{1}{4}$)

Principal consumers are:
Belmond School ($150-$200 per $\frac{1}{4}$ during school)
Farmers Creamery ($40-$50 per $\frac{1}{4}$)
Belmond Hospital ($20-$25 per $\frac{1}{4}$)
Case Hotel ($15 per $\frac{1}{4}$)
Thompson Hi-Bred Corn Co. is small user, mainly for fire protection, etc.

Air conditioning, when done, is done by using city water

City Well: end of 5th ave. N.E., elev. 2' above M & St L depot
Creamery Well: ½ block N. of Main St. on west (river) side of Miway, elev 4' below M & St L depot
M & St L RR: just NE of intersection of 4th ave. S.E. and the RR tracks, elev = to depot

M. & St. L. R.R. well: Pump about 7000 gals per day
T.D. 30 to 40 ft., finished in sand
Water is not treated before using.

Farmers' Creamery well: Drilled in 1912 by a man from Clear Lake (Cerro Gordo Co.) Iowa.
S.W.L. = 17' below pump (or 6' below top of 6" casing). Well is pumped by a horizatal centrifugal pump at the surface, operating at 1700 rpm with 1½-inch drop pipe in the well.
The water is satisfactory for boiler use although is occasionally treated with soda ash.

Names: Mayor, Edward K. Kennedy
City Clerk, (Miss) Carrie Courtney
Water Supt., Edward F. Bailey
Creamery Mgr., Fred Thompson

Belmond (Wright Co.)

From volume 21:

Town formerly used one dug well, 14' in diameter and 25' deep and also 8 driven wells about 27' deep.

Elevated tank for storage, 1⅛ miles of mains, 16 hydrants, 56 taps, with consumption of 18,000 gallons a day.

Now have a drilled well (about 500' T.D.), diameter 10, 8 and 6 inches; casing 10" to 130 ft., 8" to about 250 ft.; curb elev. = 1180 ft.; static level = 16 ft; water encountered at 25 ft and 500 ft.; drilled in 1911 by W. L. Thorn of Sparta, Wisconsin.

Log

Gravel and clay	0	to	130
Lime rock	130	to	230
Shale	230	to	270
Lime rock			
Shale (20 to 30 ft. thick)			
Lime rock		to	500

K.E.A.

Report on the Geology and Ground-Water Possibilities

at

Belmond, Wright County, Iowa

INTRODUCTION

The town of Belmond (population in 1940 = 2,109) is located in northeastern Wright County, Iowa. The town occupies parts of sections 24 and 25 in Belmond Township (T. 93 N., R. 24 W.) and parts of sections 19, 20, 21, 28, 29 and 30 in Pleasant Township (T. 93 N., R. 23 W.).

The town is served by the Chicago Great Western Railway, the Chicago, Rock Island and Pacific Railway and the Minneapolis and St. Louis Railroad, and is situated on U. S. highway 69 and County road "U".

Topographically the town is situated on the nearly flat, undrained upland of the Mankato glacial drift surface with the broad, shallow valley of the Iowa River running approximately north-south through town. The West and East Forks of the Iowa River meet at Belmond and surface drainage is southward through this river, egentually joining the Mississippi River in southeastern Iowa.

The elevation of the land surface in town, in the valley of the Iowa River, varies between 1180 and 1190 feet, with the upland surface to the east and west rising as much as 30 or 40 feet higher.

GEOLOGY

October 18, 1957

Mr. Robert W. Rosene
Rowat-Murray Engineers
Belmond, Iowa

Dear Mr. Rosene:

We are replying to your letter of October 15 indicating that Rowat-Murray Engineers are preparing plans for a new municipal well at Belmond, Iowa and would like additional information that will aid you in this matter.

A copy of the sample log of the General Mills, Inc. Well (1951) is included with this letter. No samples were ever received on the Belmond city well. However, the section encountered in the city well, which is reported to be 525 feet deep, probably is very similar to the section in the General Mills, Inc. Well (1944) 545 feet deep. The following information was obtained on the Belmond city well some 10 years ago.

Name:	Belmond city well (1911)
Location:	End of 5th Ave., N. E.
Elevation:	2 feet above M. & St. L. depot (1180 feet a. s. l.)
Depth:	600 feet (earlier reports had it 500 feet and in 1956 it was given as 525 feet)
Driller:	W. L. Thorne, Platteville, Wis.
Date:	1911
Production data:	Static water level 24-26 feet below pump which is 10 feet below land surface. Layne turbine pump 20 hp. with 30 feet of pump column and 20 feet of tailpipe. Pump delivers 350 gpm., but some of the water is returned to the well from the discharge of the pump and only 200 gpm. is pumped for treatment and distribution. The drawdown in the well is reported to be very slight.

A newspaper clipping from the Belmond Independent dated July 1951

stressed the need for a second city well. We have no information that this well was ever drilled.

Mineral analyses of the water from the city well and the General Mills, Inc. Well (1944) are appended to this letter; also two analyses from wells producing from the Mississippian rocks at Rowan and Eagle Grove. Unfortunately, no analysis is available of the water developed in the General Mills, Inc. Well (1951). You may wish to take a sample of this water for analysis to compare it with the water from the Cedar Valley formation in the existing city well.

Based on the information we have, it would seem that the water from the Mississippian strata will be as good as the water in the present city supply and might be slightly lower in iron. As regards the production obtainable from the Mississippian rocks, the chances are also promising for a large supply, but owing to the fact that the yield of limestone beds depends on the presence of large crevices or a suitable factured condition of the beds, actual drilling and test pumping will provide the most reliable information. If necessary, acidizing the water-bearing zones may increase the yield appreciably.

In drawing up the specifications for the new city well it might be a good idea to include a production test for quantity and quality of water when the well reaches the top of the sheffield shale. If the results are not satisfactory, drilling should be continued into the Cedar Valley formation.

We trust this discussion will be of some assistance in your investigations. We shall be pleased to hear of any drilling developments at Belmond.

If there are any questions remaining or if we can provide you further information concerning this problem, please feel free to write me.

Very truly yours,

H. G. Hershey

HGH:PJH:dh
Enc. 2

OCT 16 1957

ROWAT · MURRAY Engineers

BELMOND, IOWA

October 15, 1957

DRAINAGE
MUNICIPAL
TOWN PLANNING
STRUCTURAL
HIGHWAYS
MAPPING
ESTIMATES

Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Re: Belmond, Iowa Municipal Well

Gentlemen:

We are in the process of preparing plans and specifications for a new municipal well for the City of Belmond. We have available the profile of the General Mills Well drilled in 1944. This profile was provided by your office for use in preparing plans and specifications on the Meservey Well. If possible, we would appreciate any profiles or informations which you may have on either the municipal well in Belmond or the other General Mills Well. We understand that the General Mills Well drilled in 1951 was completed in the Sheffield Shale and produces approximately 440 gallons per minute. The municipal well in Belmond has a depth of approximately 500' and apparently obtains its water from the Cedar Valley Formation. We would appreciate your comments on whether or not you would expect a water supply developed above the Sheffield Shale would be as good or better in quantity and quality as one developed in the Cedar Valley Formation.

Thank you for your courteous attention to this request.

Yours very truly,

ROWAT-MURRAY, ENGINEERS

Robert W Rosene

Robert W. Rosene, PE

RWR:dg

Knight

OCT 17 1957

Iowa

State Department of Health

REGIONAL HEALTH SERVICE

NO. 2

Fort Dodge, Iowa

EDMUND G. ZIMMERER, M. D.
COMMISSIONER
DES MOINES, IOWA

IN REPLYING
ADDRESS

X. P. Boyles

Regional Engineer

October 16, 1957

H. G. Hershey,
Director and State Geologist
Iowa Geological Survey
Iowa City, Iowa

Dear Dr. Hershey:

Re: New well development at Belmond

A recent well location survey, conducted Oct. 15, spotted a site for new development on the present water supply property at a point approximately 95' southeast of the existing well which is located in the present treatment building.

It is understood, in talking with Bob Rosene, engineer with Rowat and Murray, Consultants, and with Henry A. Hokel, mayor of Belmond, that the well will probably be constructed in the very near future and it is further understood that Mr. Rosene has contacted you with respect to general geology of the area. -- As an aid in identifying stratas, a mineral sample was secured from the General Mills well #2, constructed in 1951. This well #2 is 210' deep and is operated continuously at between 400 and 500 g.p.m. -- Another well, owned by General Mills Co., was constructed in 1944 and classified as well #1. This particular well is 445' deep and has a perforated casing between the 89' and 179' point with a 15" open hole below the 470' point. This well is also operated at 500 g.p.m.

It is believed possible that the new proposed municipal well may be terminated in the same strata tapped by the 210' General Mills well #2. This is of course problematical and dependent upon the extent and condition of the formation as found when drilling is started. In the event this upper vein will not produce, it is expected that the hole will be carried on down to the 550' vein in which both the present municipal well and the General Mills well #1 is terminated.

In the event you have not already submitted general information to Bob Rosene of Rowat & Murray Engineers, we would appreciate your forecast of possibilities in this area.

Very truly yours,

X. P. Boyles
Regional Engineer

Request from Rowat - Murray
for Belmond forecast 10/16
Given to Paul

XPB:DES
cc: Div. of Public Health Engineering
Iowa State Dept. of Health