

# 15818

IOWA GEOLOGICAL SURVEY  
In Cooperation with U.S. Geological Survey  
RECORD OF WELL

Location:

50' N AND 24' E OF NE CORNER  
OF CITY RESERVOIR

Town: SHELDON (NE) County O'BRIEN  
(SW)

Sec. 31, T. 97, N., R. 42 (W) Twp.


Well name and number \_\_\_\_\_

Owner SHELDON CITY WELL (1963)

Address SHELDON, IOWA

Tenant \_\_\_\_\_

Address \_\_\_\_\_

Contractor LAYNE-WESTERN Co.

Address 4430 COMMERCIAL AVE.  
OMAHA, NEBR.

Drillers DON OSEKA

Drilling dates Nov 25, 1963

Well data:

Altitudes: Drilling curb \_\_\_\_\_ feet; Land surface \_\_\_\_\_ feet 1418

Determined by \_\_\_\_\_

Topographic position \_\_\_\_\_

Total depth: Reported 615.6 feet; Measured \_\_\_\_\_ feet

Drilling method Rotary

Hole and casing data 484' OF 12" I.D. CSG.

120' OF 12" SCREEN

Original depth to water \_\_\_\_\_ ft. above \_\_\_\_\_ below \_\_\_\_\_ Date \_\_\_\_\_

Source of data \_\_\_\_\_

Sources of water: Principal 2.1 DAKOTA SANDSTONE

Others \_\_\_\_\_

PRODUCTION DATA

Date \_\_\_\_\_

Static water level 202.8

Pumping water level 234

Yield (g.p.m.) 608.0

Measuring point \_\_\_\_\_

Duration of pumping \_\_\_\_\_

Specific capacity \_\_\_\_\_

LABORATORY DATA

TL5-286

Well No. # 158<sup>18</sup> Sample range 0-615.6 No. of samples 62

No. of dupls. and cond. 62 Good/Washed range 220-615.6

Samples prepared by Kobes Date 12/23/63

Logged by Robinson Date 6-8-64

Correlations by \_\_\_\_\_ Date 6-8-64

1. Contract City of Sheldon, Iowa Date November 26, 1963

2. City and State Sheldon, Iowa Driller Vic Soukup

3. Well No. 9 at test hole No. 63-1 Well location (attach map) 30' North of N. E. Corner of Reservoir

4. Work completed November 25, 1963 No of man hours as charged to job on time sheet \_\_\_\_\_

5. MATERIAL:	LENGTH	DIA.	GAUGE OR WALL THICKNESS	MATERIAL	TYPE	NO. OF OPENINGS
6. Screen	<u>120'</u>	<u>12" I.D.</u>	<u>7-Gauge</u>	<u>Stainless Steel-Layne Shutter</u>		<u># 7</u>
7. Inner Casing	<u>484'</u>	<u>12" I.D.</u>	<u>3/8 Wall</u>	<u>Black Pipe</u>		<u>T &amp; C</u>

8. Outer Casing \_\_\_\_\_

9. 160 tons of gravel used in the well. Size Ashton, Iowa Concrete Sand

10. Test of well. Did you use test or permanent pump? Test 10" 9  
Size of Bowl Stages

11. Size of orifice 6" inch by 5" inch. Orifice tube reading 25" inches.

12. Pumping test — measurements from ground level:

TIME	G.P.M.	STATIC	DRAWDOWN	PUMPING LEVEL
<u>1 Hr.</u>	<u>303</u>	<u>202'</u>	<u>34'</u>	<u>236'</u>
<u>1 Hr.</u>	<u>572</u>	<u>202'</u>	<u>64'</u>	<u>266'</u>
<u>1 Hr.</u>	<u>602</u>	<u>202'</u>	<u>64'</u>	<u>266'</u>
<u>3 Hr.</u>	<u>566'</u>	<u>202'</u>	<u>34'</u>	<u>236'</u>
<u>7 Hr.</u>	<u>608'</u>	<u>202'</u>	<u>32'</u>	<u>234'</u>

13. Recovery in 5 minutes Full, in 30 minutes \_\_\_\_\_

14. Did you seal bottom of well? Yes Thickness 3/16" inches, material Stainless Steel Plate

15. Well underreamed? From \_\_\_\_\_ feet to \_\_\_\_\_ feet, \_\_\_\_\_ feet to \_\_\_\_\_ feet.

16. If all screen was not placed at bottom, state how it was spaced.

From \_\_\_\_\_ feet to \_\_\_\_\_ feet; from \_\_\_\_\_ feet to \_\_\_\_\_ feet; from \_\_\_\_\_ feet to \_\_\_\_\_ feet.

17. Depth of well from ground level to top of plug 600' Size of drilled hole 30"

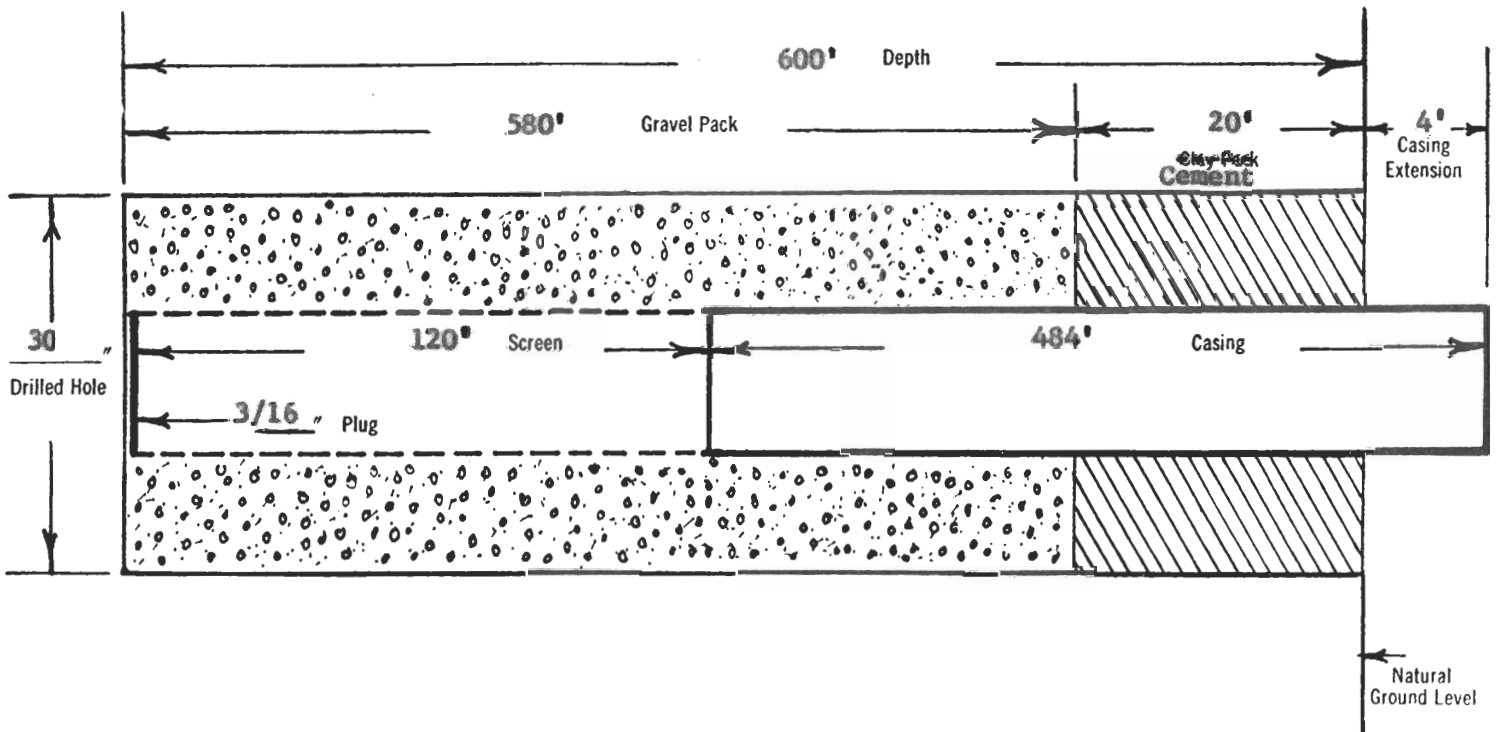
18. Was cement placed around or between any of the casings? U Yes

19. If so, state where, how much and method used. From ground level to 20' below ground

CONTRACT City of Sheldon, Iowa Well No. 9

Log of well from ground level:

Feet	Feet	Formation
0'	5'	Brown clay
5'	9'	Gravel
9'	190'	Brown clay
190'	255'	Blue clay
255'	267'	Fine sandstone
267'	307'	Blue shale, trace of sandstone
307'	310'	Limestone, hard
310'	346'	Blue shale, limestone streak
346'	427'	Gray shale sandstone streaks
427'	450'	Shaley sandstone
450'	470'	Sandstone shale streak
470'	570'	Fine to medium sandstone, clean-loose
570'	600'	Coarse sandstone, some gravel size, loose and clean



# The Tyler Standard Screen Scale

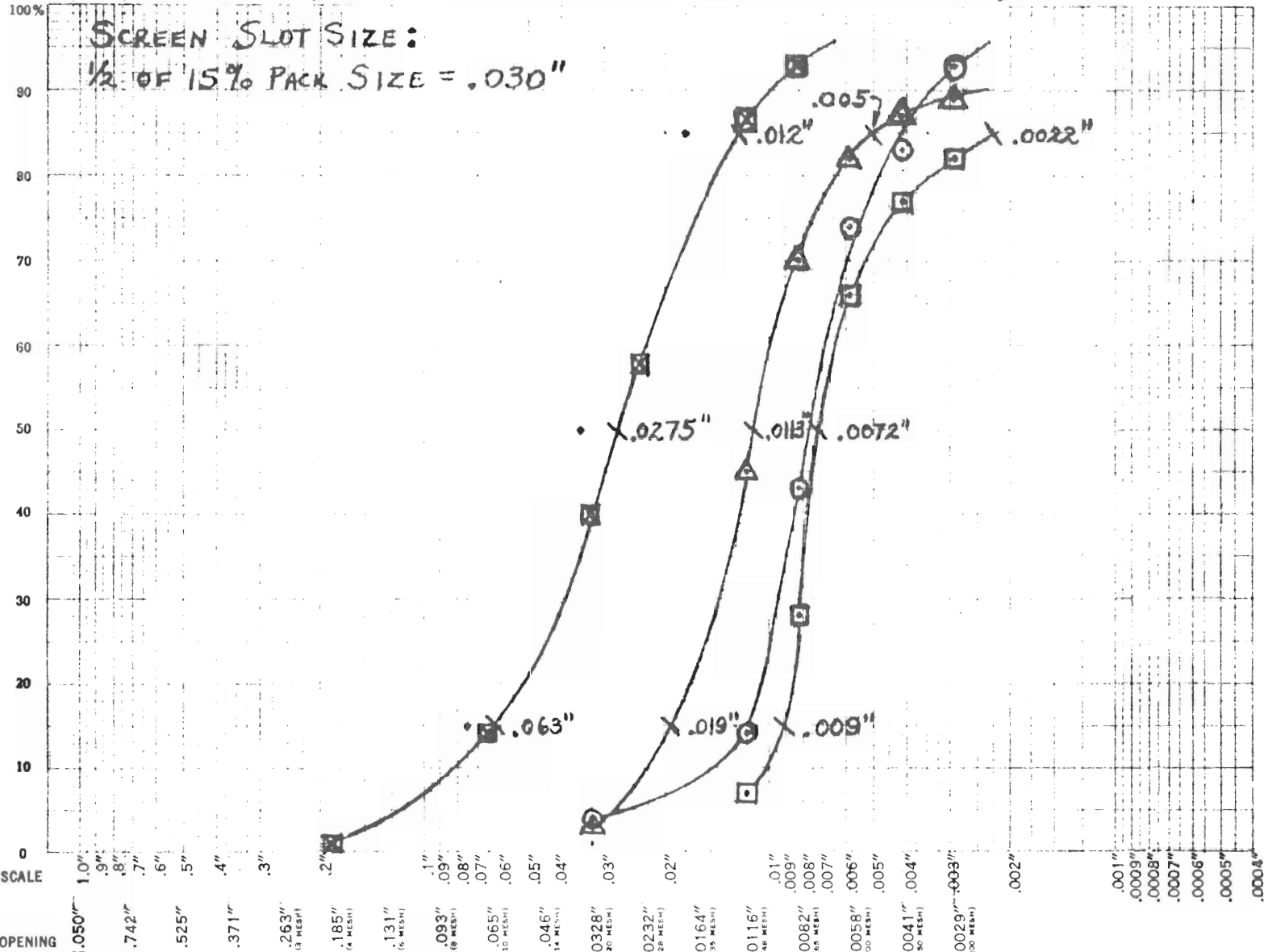
Form No. L-5  
Please mention above  
when ordering

Cumulative Logarithmic Diagram of Screen Analysis on Sample of FORMATIONS OF TEST 63-1

Name SHELDON, IOWA

Date JULY 21, 1963

SCREEN SLOT SIZE:  
1/2 OF 15% PACK SIZE = .030"



SCREEN SCALE RATIO 1.414				FORMATION 450' TO 470' (O)			FORMATION 470' TO 480' (□)			COMPOSITE FORMATION 550' TO 600' (△)		
Openings		Tyler Mesh	U. S. No.	Sample Weights	Per Cent	Per Cent Cumulative Weights	Sample Weights	Per Cent	Per Cent Cumulative Weights	Sample Weights	Per Cent	Per Cent Cumulative Weights
Inches	Milli-meters											
1.050	26.67											
.742	18.85											
.525	13.33											
.371	9.423											
.263	6.680	3										
.185	4.699	4	4									
.131	3.327	6	6									
.093	2.362	8	8									
.065	1.651	10	12									
.046	1.168	14	16									
.0328	.833	20	20		4	4					3	3
.0232	.589	28	30									
.0164	.417	35	40									
.0116	.295	48	50		10	14		7	7		42	45
.0082	.208	65	70		29	43		21	28		25	70
.0058	.147	100	100		31	74		38	66		12	82
.0041	.104	150	140		3	83		11	77		5	87
.0029	.074	200	200		10	93		5	82		2	89
.0029	.074	200	200		6	99		12	94		5	94
Totals:												

IOWA GEOLOGICAL SURVEY  
JAN 29 1964

STATE OF IOWA  
OFFICE OF THE WATER COMMISSIONER

DETERMINATION ON APPLICATION: 71-R-6-W-3119

FROM CITY OF SHELDON  
Sheldon, Iowa

Filed: January 22, 1964

Hearing held at Sheldon, Iowa on December 30, 1963.

APPEARANCES:

For the applicant:  
City of Sheldon

Merrill Fritts, Mayor

Mrs. Dorothy Mitchell  
City Clerk

James Mulder,  
City Water Commissioner

Frederick J. Matthies  
Consulting Engineer  
Leo A. Daly Company  
8600 Indian Hills Drive  
Omaha, Nebraska 68134

For the Opponents:  
None

File #3040

To the Iowa Natural Resources Council:

Pursuant to Chapter 455A, Iowa Code 1962, a public hearing on the application of the City of Sheldon, Iowa for a permit to withdraw water from a proposed well was conducted, commencing at 1:30 P.M. on December 30, 1963, at the City Hall, Sheldon, Iowa.

**FINDINGS:**

On the basis of the application, evidence presented at the hearing, and consideration of other pertinent factors, the following findings are made:

1. The City of Sheldon, Iowa, has submitted an application for a permit to withdraw water from a proposed well on its land in the NE 1/4 of Section 30, T97N, R42W, O'Brien County, Iowa, for municipal use within and without the corporate limits of said City.
2. Applicant presently withdraws water for municipal use at the maximum rate of 750 gallons per minute (gpm) from eight existing wells 23 feet to 30 feet deep in the Floyd River alluvium on said land. A maximum of 675,000 gallons of water is stored in the system, 175,000 gallons in the reservoir and 500,000 gallons in an elevated tank.
3. Applicant desires to withdraw water from all wells in the maximum quantity of 200 million gallons per year at a maximum rate of 750 gpm from the existing alluvial wells and 700 gpm from the proposed well throughout each year for the maximum legal period of ten years.
4. Notice of the public hearing on said application was duly published on December 9 and 16, 1963, in The Sheldon Sun, a newspaper published at Sheldon, Iowa, and of general circulation in O'Brien County, Iowa.
5. Applicant purportedly is titleholder of record of the land described herein.
6. The proposed well was completed on November 25, 1963 and test pumped on November 26, 1963. The well is completed in the Dakota Sandstone at a depth of 600 feet and had a static water level of 202 feet with a drawdown of about 32 feet on being test pumped at 608 gpm and full recovery in five minutes.

7. City officials testified that the present shallow well system does not provide an adequate, reliable supply of water to the city. On several occasions the city has been almost completely out of water and use of water has been voluntarily curtailed on numerous occasions. The greatest danger to the present supply of water is experienced during prolonged periods of cold weather where the soil is dry and there is little or no snow cover. Frost apparently penetrates deep into the aquifer through cracks in the dry, frozen soil.
8. It was testified that the two nearest Dakota Sandstone wells are at least one mile distant from the proposed well and that no material interference between the wells is anticipated.
9. The population of the City of Sheldon has increased from 3,768 in 1940 to 4,001 in 1950 and to 4,251 in 1960. The city presently withdraws about 150 million gallons of water per year to provide for a daily per capita use of 95-100 gallons. The requested annual quantity of water would thus provide for an increase of about one third in per capita use or a similar increase in population or a combination of both.
10. Substantially all residences and business establishments in the City of Sheldon are served by the municipal water distribution and sewage collection and treatment systems.
11. The ability and intent of the applicant to devote the requested quantity of water to a beneficial use seems evident and applicant's request for water at the maximum rate and quantity requested appears reasonable.
12. There is no evidence that the requested withdrawal of water will constitute a waste of the water resources of the State or will be detrimental to the public interest or to the interests of property owners with prior or superior rights who might be affected.
13. The request for a permit is not contested.

#### CONCLUSIONS:

1. A permit should be granted to the City of Sheldon, Iowa, to withdraw water from eight existing alluvial wells 23 feet to 30 feet deep and from a new Dakota Sandstone well about 600 feet deep all on its land in the NE 1/4 of Section 30, T97N, R42W, O'Brien County, Iowa.



2. The permit should provide that:
  - a. Permittee may withdraw only that quantity of water that can be used beneficially but not in excess of 200,000,000 gallons per year from all wells at a maximum rate of 750 gallons per minute (gpm) from the shallow wells and 700 gpm from the Dakota Sandstone well throughout each year.
  - b. Water withdrawn pursuant to this permit shall be used for municipal purposes within and without the limits of said City of Sheldon, Iowa, consistent with the municipal distribution system and other provisions of law.
  - c. This permit will terminate on January 21, 1974.
  - d. Permittee shall furnish to the Iowa Geological Survey, Iowa City, Iowa, the well log, cutting samples, and results of pumping tests for the Dakota Sandstone well.
  - e. Permittee shall comply with all applicable provisions of state law and the rules and regulations of state and local health agencies in the construction and operation of said wells and in the disposal of wastes from said City of Sheldon.
  - f. Permittee shall maintain accurate and up-to-date records of water use, water levels, and pumping rates from each aquifer and shall submit such records pursuant to direction of the Water Commissioner.
3. Permittee is advised that pursuant to Section 455A.28, Iowa Code 1962, the authority to withdraw water provided by this permit may be modified, cancelled, or suspended if the permitted withdrawals result in substantial injury to any private or public interests.

**DETERMINATION:**

A permit consistent with these findings and conclusions may properly be granted under the authority of the Water Commissioner of the State of Iowa.

*Clifford E. Peterson*

Hearing Officer: Clifford E. Peterson  
Office: Deputy Water Commissioner

Filed with the Iowa Natural Resources Council, State House, Des Moines, Iowa, on January 22, 1964.

# Layne-Western Company

4430 Commercial Avenue - Omaha, Nebraska

## TEST WELL REPORT

City and State	Sheldon, Iowa	Date	July 10, 1963
Contract	City of Sheldon, Iowa	Driller	Donald Oseka
Test No.	# 63-1	Helpers	Bill Morgan

Static Water Level

Test Log

0'	-	5'	Black soil
5'	-	9'	Gravel, coarse sand and pebbles
9'	-	17'	Brown clay
17'	-	60'	Blue clay and boulders
60'	-	86'	Brown clay
86'	-	96'	Brown sandy clay
96'	-	105'	Blue clay
105'	-	111'	Brown clay
111'	-	126'	Gray clay
126'	-	150'	Gray clay, trace sand streaks
150'	-	156'	Blue clay
156'	-	225'	Brown sandy clay
225'	-	255'	Blue shale
255'	-	268'	Fine sandstone or sand, trace of shale
268'	-	316'	Blue shale and sandstone streaks
316'	-	320'-6"	Gray shale, trace of limestone streak
320'-6"	-	322'	Limestone, hard
322'	-	331'	Gray shale
331'	-	366'	Blue shale, trace of sandstone

Size Mud Pit—Length 6' , Width 4' , Depth 3'

### WATER BEARING FORMATION DATA

Depth	Mud Viscosity	Inches Mud Taken from Pit	Drilling Time
255' to 268'	37 Seconds		
to			
to			
to			
to			
to			
to			

LOCATION:

REMARKS:

# Layne-Western Company

4430 Commercial Avenue - Omaha, Nebraska

## TEST WELL REPORT

PAGE 2

City and State      Sheldon, Iowa      Date      July 10, 1963  
Contract      City of Sheldon, Iowa      Driller      Donald Oseka  
Test No.      # 63-1      Helpers      Bill Morgan

Static Water Level

Test Log

366'	-	379'	Gray shale
379'	-	411'	Gray shale, trace fine sandstone streaks
411'	-	428'	Gray shale
428'	-	456'	Fine shaley sandstone
456'	-	471'	Fine sandstone
471'	-	554'	Sandstone fine and coarse
554'	-	556'	Shale
556'	-	599'	Sandstone, fine and coarse
599'	-	608'	Blue shale
608'	-	614'	Sandstone, fine and coarse
614'	-	615'-6"	Blue shale and limestone
615'-6"	-		Hard limestone

Size Mud Pit—Length      , Width      4'      , Depth      3'

### WATER BEARING FORMATION DATA

Depth	Mud Viscosity	Inches Mud Taken from Pit	Drilling Time
456' to 471'	38 Seconds	1 1/2"	
471' to 486'	38 Seconds	2"	
486' to 501'	38 Seconds	4"	
501' to 516'	38 Seconds	4 1/2"	
516' to 531'	38 Seconds	4"	
531' to 546'	38 Seconds	4"	
546' to 561'	38 Seconds	6"	
561' to 576'	38 Seconds	4"	
576' to 591'	38 Seconds	8"	
591' to 599'	38 Seconds	2"	
608' to 614'	38 Seconds	3"	

to

LOCATION:      50' North and 24' East of N.E. Corner of Water Reservoir

REMARKS: