Iowa Department of Natural Resources Geological Survey Bureau
109 Trowbridge Hall Iowa City, Ia. 52242-1319 PH (319) 335-1575

WELL RECORD #40316

Permit No. Permitted by Veenstra+Kimm, Inc.

Site identification

Property Owner West Des Moines Waterworks Well Number 17
Address 1505 Railroad Ave., West Des Moines, IA ~~50265~~ 50265
Tenant West Des Moines Water Works
Well Depth 43 ft Date Completed 01 / 06 / 96
From Finished casing elevation.

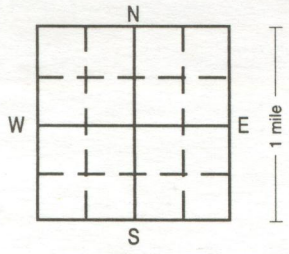
Location

County Polk

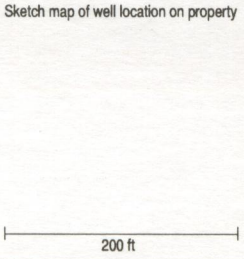
____mi. N/S and ____mi. E/W of intersection of _____and _____

____1/4 of the ____1/4 of the ____1/4 of Sec ____TWP ____ RNG____ E/W

Show exact location of well in section grid with a dot (●).



Sketch map of well location on property



☐ upland ☐ hillside ☒ valley Elevation (if known) _____

Formation log

From	To	Color	Hardness	Formation description
0	3	Tan		Clay
3	8	Black		Clay
8	16	Gray		Clay
16	39	Gray		Sand, gravel + cobbles

use additional sheets as needed

28 according to pump test, JG

Remarks (including depth of lost drilling fluids, materials, or tools)

Well use

☐ Domestic ☒ Municipal ☐ Industrial
☐ Livestock ☐ Public Supply ☐ Monitoring
☐ Test Well ☐ Irrigation ☐ Other _____ (explain)

Drill method

☒ rotary ☐ auger ☐ cable other _____

Hole size

52 inch from 0 ft to 39 ft
____ inch from ____ ft to ____ ft

hole size continued
____ inch from ____ ft to ____ ft
____ inch from ____ ft to ____ ft

Record all depth measurements from ground level (GL). Use (+) for above GL measurements.

Casing

Drive shoe (yes / no) Pitless adaptor (yes / no)

Size (ID/OD)	Type / Wt	Depth top	Depth bottom	Amount (length)
20"	0.500"	+5'	28'	33'

Perforated or slotted casing? (yes / no)

Perforated / slotted from _____ ft to _____ ft
Perforated / slotted from _____ ft to _____ ft

Casing grouted? (yes / no)

Type	Depth Top	Depth Bottom	Amount
Neat Cement	0'	10'	6 yds.

Well screen? (yes / no)

Diameter	Slot size	Depth Top	Depth Bottom	Length	Material
20"	0.080"	28'	38'	10'	SST.

Bottom capped (yes / no) with SST. Plate
Seals / Packers (yes / no) kind Bentonite depth 10'-18' ft
Gravel packed (yes / no) from 18 ft to 38 ft
type Lyman-Richey "A" amount 16 TONS

Well developed? (yes / no)

Explain Surge block, bailer + pump

Pump installed? (yes / no) Date 06 / 05 / 96

Installer's name Joe Dooling
Type of pump Vertical Turbine Depth to intake 40 ft From Top of Casing
Pump diameter 10" Rated capacity 550 GPM

Water information

Aquifer: ☒ sand/gravel ☐ limestone ☐ sandstone
Main water-supply zone from 28 ft to 38 ft
Final water level (static water level) 17 ft (below / above) GL.
Pumping water level 25 ft below GL; ☐ tape ☐ airline ☒ E-line
At yield of 500 GPM; ☒ orifice ☐ volumetric ☐ estimate Date 1/6/96

Water quality test? (yes / no) Date tested ____ / ____ / ____

Tested by West Des Moines Water Works
Test results _____

Contractor Layne-Western
Address 912 S. 14th Ave., Marshalltown, IA 50158
Driller Dave Deaver Certification no. 40259

white copy - **Iowa DNR, Geological Survey Bureau** blue copy - **Well Contractor** pink copy - **Customer** yellow copy - **County Health Officer**

WELL INSTALLATION REPORT
LAYNE-WESTERN

1. CONTRACT WITH: West Des Moines Water Works DATE: 10-19-95
2. CITY AND STATE: West Des Moines, Iowa DRILLER: Dave Deaver
3. WELL NO: 17 AT TEST HOLE NUMBER 17 WELL LOCATION: Raccoon River Park.
4. WORK COMPLETED: TOTAL MAN HOURS CHARGED TO JOB:

5. MATERIAL:

	LENGTH	DIA.	GAUGE OR THICKNESS	MATERIAL	TYPE	SLOT SIZE
6. SCREEN:	10.3'	20"	Std.	SST.	W.W.	0.080"
7. INNER CASING:	32.7'	20"	0.500"	Steel	Blank	
8. OUTER CASING:						

9. 16 TONS OF GRAVEL PACK USED IN THE WELL. SIZE: Luther Maddox "A"
10. TEST OF WELL: TEST PUMP OR PERMANENT PUMP: Test BOWL SIZE STAGES
11. SIZE OF ORIFICE: 6" x 5" ORIFICE TUBE READING:

12. PUMPING TEST - MEASUREMENTS FROM GROUND LEVEL:

TIME	GPM	STATIC	DRAWDOWN	PUMPING LEVEL
See enclosed pumping test results.				

13. RECOVERY IN 5 MINUTES: , IN 30 MINUTES:
14. DID YOU SEAL BOTTOM OF WELL Yes THICKNESS: Std. MATERIAL: SST.
15. WELL UNDERREAMED? No FROM TO , FROM TO
16. IF ALL SCREEN WAS NOT PLACED AT BOTTOM, STATE HOW IT WAS PLACED?
    FROM TO ; FROM TO ; FROM TO
17. DEPTH OF WELL FROM GROUND LEVEL 38' SIZE OF DRILL HOLE: 52"
18. WAS CEMENT PLACED AROUND OR BETWEEN ANY OF THE CASINGS? Yes
19. IF SO, STATE INTERVALS, QUANTITY, AND METHOD USED: From 0-10', 6 yards

WELL INSTALLATION REPORT (PAGE 2)

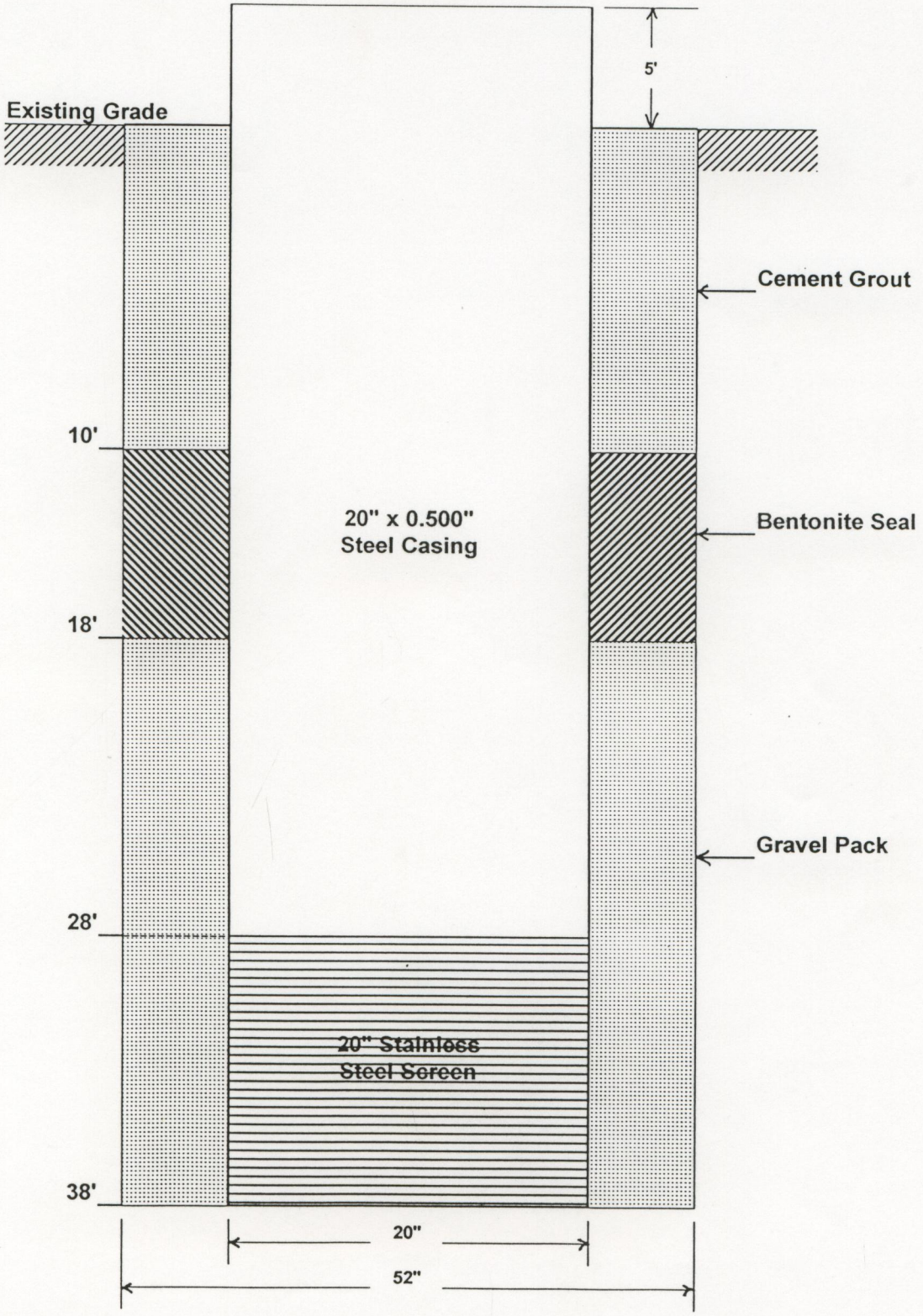
LAYNE-WESTERN

CONTRACT WITH: West Des Moines Water Works **WELL NO:** 17

LOG OF WELL FROM GROUND LEVEL:

FEET		FEET	FORMATION
0	to	3	Tan clay
3	to	8	Black clay
8	to	16	Gray clay
16	to	39	Sand & gravel, cobbles
	to		
	to		
	to		
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	to		
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WELL CONSTRUCTION DIAGRAM
WEST DES MOINES WATER WORKS
WELL #17



NOT TO SCALE

VERTICAL TURBINE

PUMP INSTALLATION REPORT

Layne-Western

JOB NAME: West Des Moines Water Works
Address: 1505 Railroad Ave., P.O. Box 65610
City, State: West Des Moines, Iowa 50265-0610

DATE: 6-5-96 Job Completion

Oil - (Water Lube)

PUMP NO: 96-09891-3 (New) Repair

Pump Trouble: New Installation

PUMP SIZE	DIAMETER		LENGTHS
Discharge	6"	(Above) Below	
Column	6"	(Screw) Flange	3 x 5' 2 x 10'
Tubing			
Shaft	1"	Stainless (Carbon)	3 x 5' 2 x 10'

Column setting to bowl: 35 ft.

BOWL:

Manufacturer: Layne
Diameter: 10" Shaft Diameter: 1-1/2"
Type: RKHC Stages: 3
Material: C.I. Bowl Length: 40"
Suction Diam: 6" Suct. Length: 2'
Special Paint, Coatings, Sleeves, etc:
Column: Epoxy coated column & bowl
Tubing:

MOTOR OR GEAR DRIVE:

Make: G.E. HP: 20
Speed: 1760 rpm Volts: 460
Frame: 256TP12 CD: 23.9"
BD: 12" Non-reverse: (Yes) / No
Serial # NND5901008
Running Amps:
Running Volts: 480
Gear Drive Ratio: None Standard / Comb.

WELL:

No: 17 Year Drilled: 1995
Location: East end of well field.
Diameter: 20" Depth: 43'
Measured from top of 20 inch diameter casing which is 3 feet above ground
5' ?
Tape to water: 22'
Airline length: 35' A.L. Material: ¼" PVC

Static Gauge: 13' Static Level: 22'
Pumping Gauge: Pumping Level:
Disch. Pressure: psi when pumping into system at gpm.

INSTALLER: Joe Dooling
Rig Used: R12 Pump Rig

PUMP REPAIR

CONDITION OF PUMP WHEN PULLED	NEW PARTS INSTALLED
Column:	Column: New Installation
Tubing:	Tubing:
Shafting:	Shafting:
Bowl:	Bowl:
Suction:	Suction:
MACHINE WORK:	1. DRAIN PORTS OPEN Yes (No) 2. CHLORINATE WELL (Yes) No 3. ALIGN PUMP HEAD WITH DIAL INDICATOR (Yes) No 4. GROUTED HEAD-BASE PLATE (Yes) No 5. PUMP RUNS (Good) / Fair / Bad

WELL TEST DATA REPORT

LAYNE-WESTERN COMPANY

PROJECT:	West Des Moines Water Works	DATE TESTED:	1/4/96 - 1/6/96
LOCATION:	West Des Moines, Iowa	TESTED BY:	Mark Evans
WELL NO:	17	DRIVER:	Submersible motor
WELL DIAMETER:	20 inches	COLUMN AND SHAFT:	6" drop pipe
WELL DEPTH:	40 feet - from top of casing	BOWL SIZE & MAKE:	
TOP OF SCREEN:	30 feet - from top of casing	MANUFACTURER:	Grundfos
STATIC LEVEL:	15.5 feet - from top of casing	SERIAL NUMBER:	
ORIFICE SIZE:	6" x 5"		

TIME	PIEZ. READ. (IN)	FLOW RATE (GPM)	AIRLINE READING (FEET)	WATER LEVEL (FEET)	DRAW DOWN (FEET)	DISCHARGE PRESSURE (LBS.)	DISCHARGE PRESSURE (FEET)	SPEC. CAPACITY (GPM/FT)	REMARKS
1 min.		498		18.8	3.3			151.9	Test was started
2		498		19.8	4.3			116.4	at 11:10 a.m.
3		498		20.1	4.6			108.8	
4		498		20.5	5.0			100.0	
5		498		20.6	5.1			98.1	
6		498		21.5	6.0			83.3	
7		498		23.3	7.8			63.7	
8		498		22.9	7.4			67.7	
9		498		22.9	7.4			66.9	
10		498		23.1	7.6			65.9	
11		498		23.1	7.6			65.3	
12		498		23.2	7.7			64.8	
13		498		23.2	7.7			64.4	
14		498		23.3	7.8			64.0	
15		498		23.3	7.8			63.8	
18		498		23.3	7.8			63.5	
21		498		23.4	7.9			63.4	
24		498		23.4	7.9			63.4	
27		498		23.4	7.9			63.2	
30		498		23.4	7.9			63.4	
35		498		23.4	7.9			63.3	
40		498		23.4	7.9			63.0	
45		498		23.5	8.0			62.6	
50		498		23.5	8.0			62.1	
55		498		23.6	8.1			61.7	

WELL TEST DATA REPORT

LAYNE-WESTERN COMPANY

PROJECT:	West Des Moines Water Works	DATE TESTED:	1/4/96 - 1/6/96
LOCATION:	West Des Moines, Iowa	TESTED BY:	Mark Evans
WELL NO:	17	DRIVER:	Submersible motor
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WELL DEPTH:	40 feet - from top of casing	BOWL SIZE & MAKE:	
TOP OF SCREEN:	30 feet - from top of casing	MANUFACTURER:	Grundfos
STATIC LEVEL:	15.5 feet - from top of casing	SERIAL NUMBER:	
ORIFICE SIZE:	6" x 5"		

TIME	PIEZ. READ. (IN)	FLOW RATE (GPM)	AIRLINE READING (FEET)	WATER LEVEL (FEET)	DRAW DOWN (FEET)	DISCHARGE PRESSURE (LBS.)	DISCHARGE PRESSURE (FEET)	SPEC. CAPACITY (GPM/FT)	REMARKS
1 hr.		498		23.7	8.2			61.0	
1:10		498		23.7	8.2			61.0	
1:20		498		23.8	8.3			60.1	
1:30		498		23.8	8.3			60.2	
1:40		498		23.9	8.4			59.3	
1:50		498		24.0	8.5			58.7	
2:00		498		24.1	8.6			58.2	
2:10		498		24.1	8.6			58.2	
2:20		498		24.1	8.6			58.2	
2:30		498		24.1	8.6			58.1	
2:40		498		24.1	8.6			58.1	
2:50		498		24.2	8.7			57.5	
3:00		498		24.2	8.7			56.9	
4 hrs.		498		24.3	8.8			56.6	
5		498		24.5	9.0			55.3	
6		498		24.5	9.0			55.1	
7		498		24.8	9.3			53.7	
8		498		24.8	9.3			53.6	
9		498		24.8	9.3			53.4	
10		498		24.9	9.4			53.2	
11		498		24.9	9.4			53.0	
12		498		25.1	9.6			51.8	
13		498		25.1	9.6			51.8	
14		498		25.1	9.6			51.7	
15		498		25.2	9.7			51.6	

WELL TEST DATA REPORT

LAYNE-WESTERN COMPANY

PROJECT: West Des Moines Water Works
LOCATION: West Des Moines, Iowa
WELL NO: 17
WELL DIAMETER: 20 inches
WELL DEPTH: 40 feet - from top of casing
AIRLINE LENGTH: 30 feet - from top of casing
STATIC LEVEL: 15.5 feet - from top of casing
ORIFICE SIZE: 6" x 5"

DATE TESTED: 1/4/96 - 1/6/96
TESTED BY: Mark Evans
DRIVER: Submersible motor
COLUMN AND SHAFT: 6" drop pipe
BOWL SIZE & MAKE:
MANUFACTURER: Grundfos
SERIAL NUMBER:

TIME	PIEZ. READ. (IN)	FLOW RATE (GPM)	AIRLINE READING (FEET)	WATER LEVEL (FEET)	DRAW DOWN (FEET)	DISCHARGE PRESSURE (LBS.)	DISCHARGE PRESSURE (FEET)	SPEC. CAPACITY (GPM/FT)	REMARKS
16 hrs.		498		25.4	9.9			50.3	
17		498		25.4	9.9			50.3	
18		498		25.4	9.9			50.2	
19		498		25.4	9.9			50.2	
20		498		25.4	9.9			50.1	
21		498		25.7	10.2			49.0	
22		498		25.7	10.2			48.9	
23		498		25.7	10.2			48.7	
24		498		25.7	10.2			48.6	
25		498		25.7	10.2			48.7	
26		498		25.7	10.2			48.8	
27		498		25.9	10.4			47.7	
28		498		25.9	10.4			47.7	
29		498		25.9	10.4			47.7	
30		498		25.9	10.4			47.7	
31		498		25.9	10.4			47.7	
32		498		25.9	10.4			47.7	
33		498		26.1	10.6			46.9	
34		498		26.2	10.7			46.4	
35		498		26.2	10.7			46.4	
36		498		26.2	10.7			46.4	
37		498		26.2	10.7			46.3	
38		498		26.2	10.7			46.3	
39		498		26.3	10.8			46.2	
40		498		26.3	10.8			46.2	

WELL TEST DATA REPORT

LAYNE-WESTERN COMPANY

PROJECT: West Des Moines Water Works

LOCATION: West Des Moines, Iowa

WELL NO: 17

WELL DIAMETER: 20 inches

WELL DEPTH: 40 feet - from top of casing

TOP OF SCREEN: 30 feet - from top of casing

STATIC LEVEL: 15.5 feet - from top of casing

ORIFICE SIZE: 6" x 5"

DATE TESTED: 1/4/96 - 1/6/96

TESTED BY: Mark Evans

DRIVER: Submersible motor

COLUMN AND SHAFT: 6" drop pipe

BOWL SIZE & MAKE:

MANUFACTURER: Grundfos

SERIAL NUMBER:

TIME	PIEZ. READ. (IN)	FLOW RATE (GPM)	AIRLINE READING (FEET)	WATER LEVEL (FEET)	DRAW DOWN (FEET)	DISCHARGE PRESSURE (LBS.)	DISCHARGE PRESSURE (FEET)	SPEC. CAPACITY (GPM/FT)	REMARKS
41 hrs.		498		26.3	10.8			46.2	
42		498		26.3	10.8			46.2	
43		498		26.4	10.9			45.5	
44		498		26.5	11.0			45.2	
45		498		26.5	11.0			45.2	
46		498		26.5	11.0			45.1	
47		498		26.6	11.1			45.0	
48		498		26.6	11.1			45.0	