

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

1.92' surface pipe

Date April 7 1925

Job ANNA WOODSTROM

Hole No.

Rig No. N-4 Brewster

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
190	191	 	 	 				
	92	 	 	 				
	93	4:40 ^{AM}	4:54	14			SHALE	START 15" HOLE APRIL 7 1925
	94		5:11	17				
	195		5:30	18				
	96		5:55	25				
	97		6:30	35				
	98		7:10	40				
	99		7:40	30				
	200		8:10	30				
	01		8:35	25				
	02		8:50	15				
	03		9:05	5				
	04		9:00	5				
	205		9:05	5			SHALE + COAL	
	06		9:09	4				
	07		9:13	4				
	08		9:17	4				
	09		9:25	8				
	210		9:37	12				
	11		9:47	10				
	12		9:54	7				
	13		10:00	6				
	14		10:07	7				
	215		10:15	8				
	16		10:26	11				
	17		10:36	10				
	18		10:50	14				
	19		11:00	10				
	220	11:30	11:38	8				CONN # 7 D.C.

ADDITIONAL REMARKS, ETC.

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-7-75

Job AMANA Norstrom Motel

Hole No. # 4

Rig No. Breenster

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
220	221	11:38	11:42	4			Shale	15" hole
	22		11:46	4				
	23		11:50	4				
	24		11:55	5				
	225		12:00	5				
	26		12:05	5				
	27		12:10	5				
	28		12:15	5				
	29		12:22	7				
	230		12:28	6				
	31		12:36	8				
	32		12:45	9				
	33		12:55	10				
	34		1:02	7				
	35		1:10	8				KEY OUT OF CATHEAD SHAFT
	36	1:25	1:30	5				
	37		1:35	5				
	38		1:40	5				
	39		1:45	5				
	240		1:50	5				
	41		1:55	5				
	42		2:00	5				
	43		2:05	5				
	44		2:11	6				
	45		2:17	6				
	46		2:22	5				
	47		2:29	7				
	48		2:36	7				Conn # 8 D.C. @ 248
	49	2:50	2:57	7				
	250		3:05	8				

ADDITIONAL REMARKS, ETC.

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-7-75
 Job Amman 2 Norstrom and
 Hole No. 4 #
 Rig No. Brown York
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
250	51	3:05	3:12	7			Shale	
	52		3:18	6			Shale	
	53		3:23	5				
	54		3:28	5				
	55		3:35	7				
	56		3:43	8				
	57		3:51	8				
	58		4:00	9				
	59		4:14	14				
	60		4:29	15				
	61		4:45	16				
	62		4:53	8				
	63		4:59	6				
	64		5:05	6				
	65		5:12	7				
	66		5:18	6				
	67		5:25	7				
	68		5:32	7				
	69		5:40	8				
	270		5:45	5				
	71		5:52	7				
	72		5:59	7				
	73		6:03	4				
	74		6:08	5				
	75	6:18	6:25	7				
	76		6:31	6				
	77		6:37	6				
	78		6:42	5				
	79		6:48	6				
	280		6:57	9			Shale	

Conn @ 274 # 9 D.C.

ADDITIONAL REMARKS, ETC. _____

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DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-7-75

Job AMANA NORSTROM

Hole No. #9

Rig No. BREWSTER

Tour

M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
280	281	6:57	7:09	12			Shale	
	82		7:16	7			}	
	83		7:23	7				
	84		7:34	11				
285			7:40	6				
	86		7:46	6				
	87		7:53	7				
	88		7:59	6				
	89		8:14	15				
290			8:26	12				
	91		8:36	10				
	92		8:47	11				
	93		8:58	11				
	94		9:10	12				
295			9:20	10				
	96		9:30	10				
	97		9:40	10				
	98		9:48	8				
	99		9:58	10			Conn @ 299'	
300		10:10	10:27	17				
	01		10:32	5				
	02		10:37	5				
	03		10:42	5				
	04		10:47	5				
305			11:52	5				
	06							
	07	11:05		7				
	08	11:11		6				
	09	11:18		7				
310		11:25		7				
		11:30		5				

ADDITIONAL REMARKS, ETC.

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DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-7-75

Job AMANA NORSTRO

Hole No. #1

Rig No. BREWSTER

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
310	311	11:30	11:35	5			SHALE	
	12	11:35	11:40	5				
	13		11:45	5				
	14		11:50	5				
	315		11:55	5			SHALE	
	16		12:05	10				
	17		12:15	10				
	18		12:25	10				
	19		12:35	10				
	320		12:45	10			SHALE	
	21		12:53	8				
	22		1:01	8				
	23		1:09	8				
	24		1:17	8				
	325		1:25	8				
	26		1:35	10				
	27		1:45	10				
	28		2:00	15				
	29		2:15	15				Conn. @ 329'
	330	2:30	2:45	15			SHALE	
	31		2:55	10				
	32		3:05	10				
	33		3:12	7				
	34		3:19	7				
	335		3:25	6			SHALE	
	36			7				
	37			6				
	38			7				
	39			8				
	340		4:00	7				

ADDITIONAL REMARKS, ETC.

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date

Job *AMANA NorIron*

Hole No. *#4*

Rig No. *Brewster*

Tour *M M M*

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
340	341	4:00	4:08	8			<i>SHALE</i>	
	<i>42</i>		<i>4:14</i>	<i>6</i>				
	<i>43</i>		<i>4:23</i>	<i>9</i>				
	<i>44</i>		<i>4:32</i>	<i>9</i>				
<i>345</i>			<i>4:40</i>	<i>8</i>			<i>SHALE</i>	
	<i>46</i>		<i>4:50</i>	<i>10</i>				
	<i>47</i>		<i>5:05</i>	<i>15</i>				
	<i>48</i>		<i>5:15</i>	<i>10</i>				
	<i>49</i>		<i>5:23</i>	<i>8</i>				
<i>350</i>			<i>5:30</i>	<i>7</i>			<i>SHALE</i>	
	<i>51</i>		<i>5:40</i>	<i>20</i>				
	<i>52</i>		<i>5:50</i>	<i>10</i>				
	<i>53</i>		<i>6:00</i>	<i>10</i>				
	<i>54</i>		<i>6:07</i>	<i>7</i>				
<i>355</i>			<i>6:15</i>	<i>8</i>			<i>SHALE</i>	
	<i>56</i>		<i>6:22</i>	<i>12</i>				
	<i>57</i>		<i>6:32</i>	<i>10</i>				
	<i>58</i>		<i>6:40</i>	<i>8</i>				
	<i>59</i>		<i>6:52</i>	<i>12</i>				<i>Cont'd 359'</i>
<i>360</i>	<i>2:10</i>		<i>7:24</i>	<i>14</i>			<i>SHALE + Dolo.</i>	<i>SCR. RIG.</i>
	<i>61</i>		<i>7:45</i>	<i>16</i>				
	<i>62</i>		<i>8:00</i>	<i>15</i>				
	<i>63</i>		<i>8:15</i>	<i>15</i>				
	<i>64</i>		<i>8:30</i>	<i>15</i>				
<i>365</i>			<i>8:45</i>	<i>15</i>			<i>SHALE + Dolo.</i>	
	<i>66</i>		<i>9:10</i>	<i>25</i>				
	<i>67</i>		<i>9:35</i>	<i>25</i>				
	<i>68</i>		<i>10:10</i>	<i>35</i>				
	<i>69</i>		<i>10:25</i>	<i>15</i>				
<i>370</i>			<i>10:45</i>	<i>20</i>			<i>Dolo.</i>	

ADDITIONAL REMARKS, ETC.

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DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-8-75

Job AMANA Norstrom

Hole No. #9

Rig No. Brewster

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
370	371	10:45	11:06	21			Dolo. + Shale	
	72		11:36	30				
	73		11:59	33				
	74	12:40	12:40	41				15" hole
	75	12:40	1:10	30				
	76		1:30	20				
	77		1:45	15				
	78		2:19	34				
	79		2:49	30				
	380		3:30	41			TRIP FOR 12 1/4" BIT.	
	81	5:55	6:13	18			E.P.S.	
	82		6:30	17				
	83		6:45	15				12 1/4" hole.
	84		7:00	15				
	85		7:15	15				
	86		7:27	12				
	87		7:45	18				
	88		8:00	15				
	89		8:15	15				
	390		8:30	15			CONN @ 390	
	91	8:40	8:55	15				
	92		9:10	15				
	93		9:22	12				
	94		9:35	13				
	95		9:55	20				
	96		10:15	20				
	97		10:40	25				
	98		11:05	25				
	99		11:30	25				
	400		11:55	25				

ADDITIONAL REMARKS, ETC.

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date *APR 9, 1975*

Job *ANWA - 4600-7, 104*

Hole No. *#4*

Rig No. *#1 Brewster*

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
400	401	11:55	12:07	12			<i>Dolo.</i>	
	02		12:19	12				
	03		12:31	12				
	04		12:43	12				
	405		12:55	12			<i>Dolo.</i>	
	06		1:10	15				
	07		1:20	10				
	08		1:30	10				
	09		1:37	7				
	410		1:45	8			<i>Dolo.</i>	
	11		1:52	7				
	12		2:03	11				
	13		2:10	7				
	14		2:16	6				
	415		2:20	4			<i>Dolo.</i>	
	16		2:25	5				
	17		2:30	5				
	18		2:35	5				
	19		2:45	10				
420	9:55	3:00	5					<i>Conn. @ 419'</i> <i>S.P. PG.</i>
	21		3:10	10				
	22		3:15	5				
	23		3:20	5				
	24		3:25	5				
	425		3:30	5				
	26		3:37	7				
	27		3:44	7				
	28		3:50	6				
	29		3:55	5				
	430		4:00	5				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-9-75
 Job AMANA-NORDSTROM
 Hole No. #4
 Rig No. N-4 Brewster
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
430	431	4:00	4:09	9			Do. shale	
	32		4:18	9				
	33		4:27	9				
	34		4:36	9				
	435		4:45	9			Do. shale	
	36		4:55	10				
	37		5:04	9				
	38		5:14	10				
	39		5:24	10				
	440		5:34	10			Do. shale	
	41		5:44	10				
	42		5:53	9				
	43		6:02	9				
	44		6:11	9				
	445		6:20	9			Do. shale	
	46		6:28	8				
	47		6:35	7				
	48		6:42	7				
	49		6:50	8				Cont. @ 449'
	450	7:05	7:10	5			Do. S.M.C.	SEP. RIG.
	51		7:17	7				
	52		7:25	8				
	53		7:34	9				
	54		7:42	8				
	455		7:50	8			Don. SOME LINE	
	56		7:58	8				
	57		8:06	8				
	58		8:14	8				
	59		8:22	8				
	460		8:30	8			LINE	

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date *April 9, 1925*

Job *Anna-Abraham*

Hole No. *4*

Rig No. *Crewster*

Tour

M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
460	461	8:30	8:40	10			LIME	
	62		8:55	15				
	63		9:10	15				
	64		9:20	15				
	465	9:30	9:30	15			LIME	
	66		9:40	10				
	67		9:42	2				
	68		9:51	6				
	69		9:58	7				
	470		10:05	7			LIME	
	71		10:14	9				
	72		10:23	9				
	73		10:32	9				
	74		10:40	8				
	475		10:49	9			Lime	
	76		10:56	7				
	77		11:03	7				
	78		11:10	7				
	79		11:17	7				
	480	11:40	11:53	13				CONN Service Rig - C.P.S. & SWIV.
	81		12:04	11				
	82		12:15	11				
	83		12:25	10				
	84		12:35	10				
	485		12:43	8				
	86		12:53	10				
	87		1:03	10				
	88		1:15	12				
	89		1:28	13				
	490		1:45	17			Lime	

ADDITIONAL REMARKS, ETC.

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-9-75

Job AMANA Nordstrom

Hole No. #4

Rig No. BREWSTER

Tour M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
490	491	1:45	2:00	15			Lime	
	92		2:12	12				
	93		2:25	13				
	94		2:37	12				
4	95		2:49	12				
	96		3:00	11				
	97		3:18	18				
	98		3:30	12				
	99		4:43	13				
5	00		4:58	15			Lime	
	01		5:13	15				
	02		5:25	12				
	03		5:40	15				
	04		5:55	15				
5	05		6:10	15				
	06		6:28	18				
	07		6:40	12				
	08		6:50	10				
	09		7:00	10			Conn @ 509	
5	10	7:12	7:21	9				
	11		7:30	9				
	12		7:38	8				
	13		7:49	11				
	14		7:04	15				
5	15		7:14	10				
	16		7:29	15				
	17		7:45	16				
	18		8:00	15				
	19		8:09	9				
5	20		8:18	9				

ADDITIONAL REMARKS, ETC.

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date	4-9-75
Job	AMANA Nordstrom
Hole No.	#4
Rig No.	BREWSTER
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
520	21	8:18	8:28	10			Lime	
	22		8:41	13				
	23		8:51	10				
	24		9:00	9				
	25		9:11	11				
	26		9:21	10				
	27		9:31	10				
	28		9:46	15				
	29		10:00	14				
	530		10:10	10			Lime	
	31		10:20	10				
	32		10:30	10				
	33		10:40	10				
	34		10:50	10				
	35		11:00	10				
	36		11:10	10				
	37		11:25	15				
	38		11:35	10				
	39		12:45	10				Conv. @ 539'
	540	12:00	12:12	12				CR. Rig
	41		12:20	8				
	42		12:30	10				
	43		12:45	15				
	44		12:55	10				
	45			7				
	46		1:05	9				
	47		1:15	10				
	48		1:25	10				
	49		1:35	10				
	550		2:00	10				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

4-9-75

Date /
 Job AMANA Nordstrom
 Hole No. #4
 Rig No. BREWSTER
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
550	57	2:00	2:12	12			Lime	
	52		2:24	12				
	53		2:36	12				
	54		2:48	12				
	55		3:00	12			Lime	
	56		3:13	13				
	57		3:25	12				
	58		3:38	13				
	59		3:52	14				
	560		4:05	13			Lime (see log.)	
	61		4:18	13				
	62		4:30	12				
	63		4:45	15				
	64		4:57	12				
	65		5:10	13			Lime (see log.)	
	66		5:20	10				
	67		5:25	5				
	68		5:30	5				
	69		5:35	5				
	570		5:40	5				Case @ 570
	71	5:52	5:57	5				
	72		6:02	5				
	73		6:07	5				
	74		6:11	4				
	75		6:15	4			Lime (see log.)	
	76		6:20	5				
	77		6:25	5				
	78		6:30	5				
	79		6:35	5				
	580		6:40	5				

ADDITIONAL REMARKS, ETC. _____

* APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-10-75
 Job AMANA-NORSTRON
 Hole No. #4
 Rig No. BREWSTER
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
580	81	6:40						
	82						Lost Circ. W.O.W.	
	83							
	84							
	85		11:45					
	86	12:00	12:04	4				
	87		12:08	4				
	88		12:19	11				
	89		No Time					
	590		No Time					OUT OF FLUID - HAULING WATER
	91	11:35	11:45	10				
	92		11:54	9				
	93		12:03	9				
	94	4-11-75	12:10	7				WAIT ON MUD. - MIXING MUD & HAULING WATER
	95	1:10	1:15	5				
	96		1:26	5				
	97		1:30	10				
	98		No Time					
	99		"	"				
	600		"	"				CONN.
600	1		"	"				
	2		"	"				
	3		"	"				
	4		"	"				
	5			5:15				
	6			5:35	20			
	7			5:50	15			
	8			6:05	15			
	9			6:20	15			
	610			6:33	13			

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-11-75

Job AMANA

Hole No. #4

Rig No. Brewster

Tour

M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
610	611	6:33	6:48	15			Doko.	
	12		7:00	12				
	13		7:12	12				
	14		7:24	12				
615	15		7:36	12				
	16		7:46	10				
	17		7:55	9				
	18		8:04	9				
	19		8:14	10				
620	20		8:30	16				
	21		8:47	17				
	22		9:03	16				
	23		9:20	17				
	24		9:35	15				
625	25		9:50	15				
	26	12:35 AM	12:55	20				FILL UP IN PIPE FOR WEEKEND. TAKING FLUID.
	27		1:15	20				
	28		1:32	17				
	29		1:50	18				
630	30	3:35	3:50	15				Cont. @ 629'
	31		4:10	20				BIT PLUGGED-BREAK
	32		4:25	15				CIRC. + CIRC. NO CONNECTION
	33		4:45	20				BECAUSE OF FILL UP.
	34		5:00	15				
635	35		5:20	20				
	36		5:40	20				
	37		6:00	20				
	38		6:18	18				
	39		6:35	17				
640	40		6:55	20:33	13			

ADDITIONAL REMARKS, ETC.

CALL FUEL MAN MON. MOR

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date *Apr. 14, 1925*

Job *Maple-Croston*

Hole No. *4*

Rig No. *N-4 Brewster*

Tour

M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
<i>640</i>	<i>641</i>	<i>6:55</i>	<i>7:11</i>	<i>16</i>			<i>SAMPLES</i>	<i>AXIG FLUID</i>
	<i>42</i>		<i>7:20</i>	<i>9</i>				
	<i>43</i>		<i>7:34</i>	<i>14</i>				
	<i>44</i>		<i>7:50</i>	<i>16</i>				
	<i>645</i>		<i>8:05</i>	<i>15</i>			<i>NO SAMPLES</i>	
	<i>46</i>		<i>8:25</i>	<i>30</i>				
	<i>47</i>		<i>8:55</i>	<i>30</i>				
	<i>48</i>		<i>9:15</i>	<i>20</i>				
	<i>49</i>		<i>9:30</i>	<i>20</i>				
	<i>650</i>		<i>9:52</i>	<i>22</i>			<i>NO SAMPLES</i>	
	<i>51</i>		<i>10:12</i>	<i>20</i>				
	<i>52</i>		<i>10:30</i>	<i>18</i>				
	<i>53</i>		<i>10:45</i>	<i>15</i>				
	<i>54</i>		<i>10:58</i>	<i>13</i>				
	<i>655</i>		<i>11:15</i>	<i>17</i>			<i>(NO SAMPLES) Lining fluid</i>	
	<i>56</i>		<i>11:27</i>	<i>12</i>				
	<i>57</i>		<i>11:45</i>	<i>18</i>				
	<i>58</i>		<i>12:03</i>	<i>18</i>				
	<i>59</i>		<i>12:20</i>	<i>17</i>				
	<i>660</i>		<i>12:35</i>	<i>15</i>			<i>KELLY 4' LONG</i>	
	<i>61</i>		<i>12:50</i>	<i>15</i>			<i>CONN @ 661 SER. RIG.</i>	
	<i>62</i>	<i>1:55</i>	<i>2:00</i>	<i>5</i>				
	<i>63</i>		<i>2:05</i>	<i>5</i>				
	<i>64</i>		<i>2:10</i>	<i>5</i>				
	<i>665</i>		<i>2:15</i>	<i>5</i>				
	<i>66</i>		<i>2:20</i>	<i>5</i>				
	<i>67</i>		<i>2:24</i>	<i>4</i>				
	<i>68</i>		<i>2:28</i>	<i>4</i>				
	<i>69</i>		<i>2:34</i>	<i>6</i>				
	<i>670</i>		<i>2:40</i>	<i>6</i>				

ADDITIONAL REMARKS, ETC.

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DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date *Apr. 14, 75*

Job *Amana Nordstein*

Hole No. *#4*

Rig No. *Brewster*

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
<i>670</i>	<i>671</i>	<i>2:40</i>	<i>2:46</i>	<i>6</i>				
	<i>72</i>		<i>2:53</i>	<i>7</i>				
	<i>73</i>		<i>3:04</i>	<i>11</i>				
	<i>74</i>		<i>3:11</i>	<i>7</i>				
	<i>75</i>		<i>3:16</i>	<i>5</i>				
	<i>76</i>		<i>3:25</i>	<i>9</i>				
	<i>77</i>		<i>3:41</i>	<i>16</i>				
	<i>78</i>		<i>3:58</i>	<i>17</i>				
	<i>79</i>		<i>4:08</i>	<i>10</i>				
	<i>680</i>		<i>4:22</i>	<i>14</i>				
	<i>81</i>		<i>4:34</i>	<i>12</i>				
	<i>82</i>		<i>4:46</i>	<i>12</i>				
	<i>83</i>		<i>4:58</i>	<i>12</i>				
	<i>84</i>		<i>5:08</i>	<i>10</i>				
	<i>85</i>		<i>5:17</i>	<i>9</i>				
	<i>86</i>		<i>5:26</i>	<i>9</i>				
	<i>87</i>		<i>5:35</i>	<i>9</i>				
	<i>88</i>		<i>5:45</i>	<i>10</i>				
	<i>89</i>		<i>5:55</i>	<i>10</i>				
<i>690</i>			<i>6:05</i>	<i>10</i>				
	<i>91</i>	<i>6:38</i>	<i>6:49</i>	<i>11</i>				<i>Conn @ 690 - circ. clean hole & hooking up water pump</i>
	<i>92</i>		<i>7:00</i>	<i>11</i>				
	<i>93</i>		<i>7:13</i>	<i>13</i>				
	<i>94</i>		<i>7:25</i>	<i>12</i>				
	<i>95</i>		<i>7:45</i>	<i>20</i>				
	<i>96</i>		<i>7:55</i>	<i>10</i>				
	<i>97</i>		<i>8:04</i>	<i>9</i>				
	<i>98</i>		<i>8:12</i>	<i>8</i>				
	<i>99</i>		<i>8:20</i>	<i>8</i>				
	<i>200</i>		<i>8:30</i>	<i>10</i>				

ADDITIONAL REMARKS, ETC.

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date	4-14-75
Job	AMANA Nordstrom
Hole No.	#4
Rig No.	Beemster
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
700	701	8:30	8:43	13				
	02		8:55	12				
	03		9:05	10				
	04		9:15	10				
	705		9:25	10				
	06		9:37	12				
	07		9:47	10				
	08		10:00	13			GUN PITS	
	09	10:18	10:38	10				
	710		10:33	9				
Mag	11		10:45	8				
	12		10:53	8				
	13		11:00	7				
	14		11:07	7				
	15		11:15	8				
	16		11:23	10				
	17		11:33	12				
	18		11:51	14				
	19		12:03	12				
	720		12:15	12				
	21	3:15	5:21	6				
	22		5:27	6				
	23		5:33	6				
	24		5:39	6				
	25		5:45	6				
	26		5:51	6				
	27		5:59	7				
	28		6:05	7				
	29		6:12	7				
	730		6:20	8				

ADDITIONAL REMARKS, ETC. _____

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date *April 15, 1975*

Job *Ag. 12 - Woodrow*

Hole No. *4*

Rig No. *W-4 Brewster*

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
730	731	6:20	6:30	10				
	32		6:40	10				
	33		6:50	10				
	34		6:55	5				
	35		7:00	5				
	36		7:10	10				
	37		7:25	15				
	38		7:45	20				
	39		8:05	20				
	740		8:30	25				
	41		8:40	10				
	42		8:50	10				
	43		8:57	7				
	44		9:03	6				
	45		9:10	7				
	46		9:16	6				
	47		9:21	5				
	48		9:27	6				
	49		9:35	8				
	750		9:42	7				
	51		9:50	8				<i>Coils @ 251'</i>
	52	10:05	10:10	5				
	53		10:14	4				
	54		10:18	4				
	55		10:21	3				
	56		10:27	6				
	57		10:33	6				
	58		10:40	7				
	59		10:47	7				
	760		10:55	8				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-15-75

Job AMANA NORDSTROM

Hole No. # 4

Rig No. BREWSTER

Tour

M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
760	761	10:55	11:03	8				
	62		11:10	7				
	63		11:17	7				
	64		11:24	7				
	65		11:31	7				
	66		11:39	8				
	67		11:48	9				
	68		11:57	9				
	69		12:05	8				
770	770	7:30	7:37	7				PULL UP 1 STD. + GO THRU PUMP NEW PISTON HENDS ON BOTH SIDES + CLEAN CUTTINGS OUT OF OTHER SIDE OF PUMP.
	71		7:46	9				
	72		7:55	9				
	73		8:04	9				
	74		8:13	9				MIX 40 SKS GEL @ 775
	75		8:20	7				
	76	7:48	10:00	12				
	77		10:10	10				
	78		10:20	10				
	79		10:30	10				
780	780		10:42	12				
	81		10:53	11				
	82		11:05	12				
	83	7:00	7:40	40				Conn @ 782 MIXING MUD, CAUSTIC, + SEALED ASH - CLEAN UP HOLE
	84		8:10	30	AIR PUMP	C.P.S.		
	85	8:20	8:10	20				
	86		9:00	20	AIR PUMP	C.P.S.		
	87	9:05	9:25	20				
	88		7:45	20	AIR PUMP	C.P.S.		
	89	9:50	10:00	10				
790	790		10:10	10				SHALE (WITH LINE BREAKS)

ADDITIONAL REMARKS, ETC.

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date	April 16, 1925		
Job	Lump - 10057404		
Hole No.	4		
Rig No.	No. Brunster		
Tour	M		M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
290	291	10:10	10:22	12				
	92		10:33	11				
	99	10:55	11:05	10				C.P.S. & SER RIG!
	94		11:10	5				
	295		11:23	12				
	96		11:32	10				
	97		11:42	10				
	99		11:52	10				C.P.S.
	99	12:00	12:13	13				
	300		12:24	11				
	01		12:34	10				
	02		12:44	10				
	03		12:53	9				
	04		1:00	7				C.P.S.
	805	1:09	1:19	10				
	06		1:29	10				
	07		1:39	10				
	08		1:47	8				
	09		1:54	7				
	810		2:03	9				
	11	2:17	2:24	7				
	12		2:31	7				
	13		2:38	7				
	14		2:46	8				
	815		3:55	9				
	16		4:05	10				
	17		4:12	7				
	18		4:18	6				
	19		4:30	12				
	820		4:45	15				

400
~~3 1/2~~
~~if~~
~~46~~ (C.P.S.) + C.P.S.
 810
 1/2 | 1400
 12 | 40 3 1/2
 20 | 4
 24
 18
 MA 25# Lime
 C.P.S.

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____ DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Apr. 16, 75

Date _____

Job Armana Mudstone

Hole No. 44

Rig No. Brewster

Tour _____ M _____ M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
820	821	3:45	3:54	9			S.	
	22		4:03	9				
	23		4:12	9				
	24		4:26	14				C.P.S.
	25	4:35	4:45	10				
	26		4:57	12				
	27		5:10	13				
	28		5:20	10				
	29		5:30	10				
830			5:43	13				
	31		5:52	9				
	32	6:01	6:13	12				C.P.S.
	33		6:24	11				
	34		6:35	11				
835			6:50	15			Shale	
	36		7:04	14				
	37		7:18	14				
	38		7:30	12				
	39	7:30	7:40	10				
840			7:54	14				
	41		8:10	16				
	42		8:17	7				
	43		8:23	6				
	44		8:27	4				
	45		8:32	5				
	46		8:40	8				
	47		8:48	8				
	48		8:56	8				
	49		9:03	7				
850			9:15	12				

838' →
Conn

ADDITIONAL REMARKS, ETC. _____

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DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date	Apr. 16, 95
Job	Aman's Woodstern
Hole No.	#4
Rig No.	Brewster
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
850	851	9:15	9:28	13			SHALE + Dolo	
	52		9:40	12				
	53		9:55	15				
	54		10:05	10				
	55		10:15	10			SHALE + Dolo	
	56		10:27	12				
	57		10:41	14				
	58		10:55	14				
	59		11:10	15				
	860		11:35	15			SHALE + Dolo.	
	61		11:35	10				
	62		11:45	10				
	63	11:50	12:00	10				ARR. Pump-CLEAN SCREEN
	64		12:10	10				
	65		12:25	15			SHALE + Dolo.	
	66		12:40	15				
	67		12:50	10				
	68		1:05	15				
	69		1:15	10				
	870		1:25	10			SHALE + Dolo.	COND @ 870'
	71	1:40	1:50	10				SER. RIG.
	72		2:00	10				
	73		2:11	11				
	74		2:24	13				
	75		2:35	11			SHALE + Dolo	
	76		2:47	12				
	77		3:00	13				
	78		3:13	13				
	79		3:25	12				
	880		3:37	12			SHALE + Dolo	

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-17-75
 Job Imana Nordstrom
 Hole No. # 4
 Rig No. Brewster
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
880	881	3:37	3:47	10				
	882		3:55	8				
	883		4:10	15				
	884		4:21	11				
	885		4:30	9			Shale + D. lo	
	886		4:42	12				
	887		4:55	13				
	888		5:07	12				
	889		5:20	13				
	890		5:35	15			Shale + D. lo	
	891		5:55	20				
	892		6:07	12				
	893		6:15	8				
	894		6:25	10				
	895		6:35	10			SHALE + D. lo	
	896		6:45	10				
	897		6:55	10				
	898		7:05	5				
	899		7:10	5				
	900		7:15	5				Case @ 900'
	901	7:30	7:30	0				SEP. RIG. C.P.S.
	902		7:45	8				
	903		7:55	10				
	904		8:05	10				
	905		8:12	7				
	906		8:19	7				
	907		8:28	9				
	908		8:38	10				
	909		8:48	10				
	910		8:58	10				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date	APRIL 13, 1975
Job	AYANA - WRESTON
Hole No.	#4
Rig No.	H-4 Brewster
Tour	M M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
910	911	8:58	9:04	6			SMIC + Dora	
	12		9:11	7				
	13		9:24	13				
	14		9:37	13				
	915		9:50	13				
Galena	16		10:09	19				
	17		10:30	21				
	18		10:57	27				
	19		11:17	20				
	920		11:40	23				
	21		12:00	20				
	22		12:10	10				
	23		12:26	16				
	24		12:35	9				
	925		1:05	30				
	26		1:30	25				
	27		2:00	30				
	28		2:20	20				
	29		2:40	20				Conn 4 C.P.S.
930	2:59		3:20	21				SEK RIG
	31		3:36	16				
	32		3:40	14				
	33		4:10	30			Dogs + C.P.S.	
	34		4:40	30				
	935		4:52	12				
	36		5:09	17				
	37		5:25	16				
	38		5:40	15				
	39		5:50	10				
	940		6:04	14				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-17-75
 Job AMANA IOWA
 Hole No. 74
 Rig No. Brewster
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
940	941							
	92							
	43							
	44							
	45							
	46		7:10	15				
	47		7:27	17				
	48		7:43	16				
	49		8:00	17				
950			8:15	15				
	51		8:30	15				
	52		8:50	20			Mix 25 # lime. W.P.S.	
	53	9:38	10:05	27				
	54		10:43	38				
	55		11:25	42			dir lime C.P.S.	
	56	12:25	1:10	45			Tight Hole	
	57	6:30	6:40	10			trip for @ 60g'	
	58		6:50	10			Button Bit Working pipe	
	59		7:05	15			out	
	60		7:20	15				
	61		7:35	15				
	62	7:50	8:15	25			Prep. C.P.S.	
	63		8:35	20				
	64		8:50	15				
	65		9:14	24				
	66		9:30	16				
	67		9:45	15				
	68		10:02	17				
	69		10:22	20				
	70		10:42	20				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-18-75

Job AMANA Nordstrom

Hole No. #4

Rig No. BREWSTER

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
970	971	10:42	11:00	18				
	72		11:20	20				
	73		11:40	20				
	74		12:03	23				GO THRU VALVES ON OTHER SIDE
	75	12:50	1:06	16				OF PUMP - C.P.S.
	76		1:25	19				
	77		1:48	23				
	78		2:10	22				
	79		2:33	23				
	980		2:55	22				
	81		3:14	19				
	82		3:29	15				
	83		3:45	16				
	84		4:05	20				
	85		4:22	17				
	86		4:40	18				CLEANING PITS OUT MIXING 50# CAUSTIC
	87	X	X	NO TIME				CIRC. & PULL 25 STG GEL - HAULING
How Spild.	88	1:00	1:16	16				UP IN PIPE FOR WATER
	89		1:40	24				WEEKEND.
	990		1:55	15				
	91	2:25	2:45	20				Gun up PITS AGAIN @ 991
	92	3:55	4:10	15				ADD 25# CAUSTIC, P.H. 8 BACK FLOOR
	93		4:33	23				MIXING GEL
	94		5:00	27				
	95		5:35	35				
	96		5:50	15				
	97		6:05	15				
	98		6:30	25				
	99		6:55	25				
	2000		7:20	25				

ADDITIONAL REMARKS, ETC.

FUEL OFF @ TANK

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date *June 21, 1925*

Job *Payson Bradstreet*

Hole No. *4*

Rig No. *N-4 Brewster*

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1000	1001	7:20	7:45	25				
	02		8:10	25				
	03		8:35	25				
	04		9:05	30				
	1005		9:35	30				
	06		9:58	23				
	07		10:25	27				50% CAUSTIC
	08		10:55	30				
	09		11:25	30				
	1010	1:09	1:20	11				
	11		1:37	17				
	12		1:59	22				
	13		2:13	14				
	14		2:32	19				
	1015		2:50	18				
	16		3:00	10				
	17		3:12	12				
	18	4:10	4:20	10				
	19		4:30	10				
	1020		4:40	10				
	21	4:55	5:10	15				CONN @ 1020 + MIX 10 STS GEL.
	22		5:25	15				
	23		5:38	13				
	24		5:50	12				
	1025		6:00	10				
	26		6:11	11				
	27		6:22	11				
	28		6:33	11				
	29		6:44	11				
	1030		6:55	11				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date	Mar 21 75
Job	Amara, Iowa
Hole No.	#4
Rig No.	Brewster
Tour	M M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1030	1031	6:55	7:05	10				
	32		7:15	10				
	33		7:25	10				
	34		7:35	10				
	35		7:46	11				
	36		7:56	10				
	37		8:05	9				
	38		8:15	10				
	39		8:30	15				Mixing 5 SRS GEL.
1040	9:10	9:20	10					
	41		9:37	17				
	42		9:48	11				
	43		10:05	17				
	44		10:22	17				
	45		10:45	23				
	46		11:00	15				
	47		11:14	14				
	48		11:31	17				
	49		11:55	24				
1050		12:10	15					Conn. @ 1050
	51	12:25	12:40	15				
	52		12:55	15				
	53		1:10	15				
	54		1:24	14				
	55		1:41	17				
	56		2:00	19				
	57		2:20	20				
	58		2:40	20				
	59		2:55	15				
1060	300	3:03	35					

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date APRIL 23, 75
 Job ANNA-ROOSTROM
 Hole No. 4
 Rig No. H-4 Brewster
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1060	1061	3:15	3:30	15			1060	
	62		3:45	15				
	63		4:00	15				
	64		4:17	17				
	1065		4:34	22				
	66		4:56	17				
	67		5:16	20				
	68		5:38	20				
	69		5:58	20				
	1070		6:16	18			1070	
	71		6:35	19				
	72		6:55	20				
	73		7:15	20				Air Out Pump C.P.S.
	74	7:25	7:47	22				
	1075		8:02	15				
	76		8:25	23				
	77		8:50	25				
	78		9:17	27				
	79		9:40	23				
	1080		10:00	20				Conn. @ 1070'
	81	10:13	10:26	13				Grease Swiv. - SER RIG
	82		10:41	15				
	83		10:56	15				
	84		11:15	19				
	1085		11:30	15			Disco.	
	86		11:45	15				" MISSING MUD
	87	12:15	12:33	18				
	88		12:43	10				
	89		1:00	17				
	1090		1:15	15				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date	4-22-75
Job	Amana Nordstrom
Hole No.	# 4
Rig No.	Brewster
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1090	1091	1:15	1:30	15				
97	92		1:43	13				
	93		2:05	22				
	94		2:24	19				
	95		2:43	19				
	96		2:59	16				
	97		3:15	16				
	98		3:31	16				
	99		3:47	16				
	1100		4:15	28				Mining Gen. & C.P.S.
	01	4:50	5:02	12				
	02		5:13	11				
	03		5:30	17				
	04		5:41	11				
	05		5:53	12				
	06		6:05	12				
	07		6:20	15				
	08		6:37	17				
	09		6:55	18				
	1110		7:12	17				Conn @ 1110'
	11	7:30	7:32	12				
	12		7:42	10				
	13		7:59	17				
	14		8:10	11				
	15		8:22	12				
	16		8:40	18				
	17		8:52	12				
	18		9:04	12				
	19		9:29	25				
	1120		9:54	25				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-22-75

Job Amara

Hole No. #4

Rig No. Brewster

Tour M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1120	1121	9:54	10:10	16			Dolo.	
	22		10:22	12				
	23		10:43	21				
	24		11:05	22				
	25		11:15	10			Dolo.	Mix 1/2 SK. CEMENT
	26	11:28	11:43	15				C.P.S.
	27		11:00	17				
	28		12:15	15				
	29		12:35	20				
	1130		12:55	20				
	31		1:10	15				
	32		1:27	17				
	33		1:45	13				
	34		1:55	10				
	35		2:10	15				
	36		2:25	15				
	37		2:50	25				
	38		3:10	20				
	39		3:35	25				
	1140		3:50	15				Cons @ 1140'
	41	4:05	4:10	15				Sec. Rig.
	42		4:35	15				
	43		4:40	5				
	44		4:50	10				
	45		5:03	13			Dolo.	
	46		5:13	10				
	47		5:23	10				
	48		5:40	17				
	49		5:54	14				
	1150		6:06	12				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-23-75

Job *Armas*

Hole No. #4

Rig No. *Brewster*

Tour M M

350
4/14 00
1200
30
210

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1150	1151	6:06	6:17	11				
	52		6:31	14				
	53		6:46	15				
	54		7:15	19				
	1155		7:15	10				
	56		7:28	13				
	57		7:50	22				
	58		8:05	15				
	59		8:25	20				
	1160	8:35	9:00	25				AIR PUMP C.P.S.
	61	12:28	12:40	12				TEAR DOWN DRIVER SIDE OF PUMP.
	62		12:58	18				
	63		1:20	22				
	64		1:36	16				
	1165		1:53	17				DoLo.
	66		1:12	19				
	67		2:24	12				
	68		2:39	15				
	69		2:54	15				
	1170		3:10	16				
	71		3:35	25				CONN @ 1171 4 MIN LINE
	72	11:45	11:37	22				BIT PLUGGED
	73	11:42	12:20	33				TEAR FOR TOOTH BIT.
	74		12:45	25				FEED & WASH 90'
	1175		1:05	20				
	76	1:10	1:30	20				
	77		1:50	20				
	78		2:08	18				
	79		2:27	19				
	1180	2:32	3:00	28				DoLo. - Slide

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date *April 24, 1925*

Job *Amara - Abastrom*

Hole No. *4*

Rig No. *N-4 Brewster*

Tour

M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
<i>1180</i>	<i>1181</i>	<i>3:00</i>	<i>3:31</i>	<i>31</i>			<i>Dolo. + Shale</i>	
	<i>82</i>		<i>4:10</i>	<i>39</i>				<i>Air Pump - C.P.S.</i>
	<i>83</i>	<i>4:25</i>	<i>5:00</i>	<i>35</i>				
	<i>84</i>	<i>5:15</i>	<i>6:15</i>	<i>60</i>				" " - "
	<i>1185</i>		<i>7:15</i>	<i>60</i>				
	<i>86</i>	<i>7:25</i>	<i>8:35</i>	<i>70</i>				" " - "
	<i>87</i>		<i>9:35</i>	<i>60</i>				
	<i>88</i>	<i>89:40</i>	<i>10:05</i>	<i>25</i>				<i>C.P.S. + Mix CAUSTIC SODA</i>
	<i>89</i>		<i>10:35</i>	<i>30</i>				
	<i>1190</i>		<i>11:10</i>	<i>35</i>				
	<i>91</i>		<i>11:43</i>	<i>33</i>				
	<i>92</i>		<i>12:15</i>	<i>32</i>				<i>C.P.S.</i>
	<i>93</i>	<i>12:29</i>	<i>1:00</i>	<i>36</i>				
	<i>94</i>		<i>1:35</i>	<i>35</i>				
	<i>1195</i>		<i>2:10</i>	<i>35</i>				
	<i>96</i>		<i>2:45</i>	<i>35</i>				
	<i>97</i>		<i>3:17</i>	<i>32</i>				
	<i>98</i>		<i>3:54</i>	<i>37</i>				
	<i>99</i>		<i>4:22</i>	<i>28</i>				
	<i>1200</i>		<i>4:50</i>	<i>28</i>				
	<i>01</i>		<i>5:20</i>	<i>30</i>				<i>Conn @ 1201</i>
	<i>02</i>	<i>5:35</i>	<i>6:15</i>	<i>30</i>				<i>SEE RIG & C.P.S.</i>
	<i>03</i>		<i>6:35</i>	<i>30</i>				
	<i>04</i>		<i>7:05</i>	<i>30</i>				
	<i>1205</i>		<i>7:37</i>	<i>32</i>				
	<i>06</i>		<i>7:57</i>	<i>20</i>				
	<i>07</i>		<i>8:20</i>	<i>23</i>				
	<i>08</i>		<i>8:38</i>	<i>18</i>				
	<i>09</i>		<i>9:07</i>	<i>29</i>				
	<i>1210</i>		<i>9:37</i>	<i>30</i>				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 7-25-25

Job August - Nordstrom

Hole No. 4

Rig No. W-4 Brewster

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1210	1211	9:35	10:10	33			Lm + Dolo.	
	12		10:40	30				
	13		11:30	50				
	14		12:05	35				
	1215		12:45	40			L + Dolo.	
	16	12:52	1:10	18				C.P.S.
	17		1:35	25				
	18		2:05	30				
	19		2:45	35				
	1220		3:10	25			Lm + Dolo.	
	21		3:50	40				
	22		4:24	34				
	23		4:50	26				
	24		5:32	42				
	1225		6:17	45			Lime + Dolo.	
	26	6:40	7:05	25				Replace Packing in Driver Side of Pump.
	27		7:30	25				See Fig.
	28		7:50	20				
	29		8:10	20				
	1230		8:32	22				Conn. @ 1230'
	31	9:15	9:33	18				Change Valve Discharge Other Side.
	32		9:52	19				
	33		10:07	15				
1233	- 34		10:15	8			Glencwood Shale	
	1235		10:24	9				
	36		10:33	9				
	37		10:40	7				
	38		10:46	8				
	39		11:00	14				
	1240		11:08	8				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-25-75

Job Amore Nordstrom

Hole No. #9

Rig No. Brewster

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1240	1241	11:08	11:20	12	*		SHALE	TOP ST. PETE
	42		11:23	3	*		SAND.	
	43		11:26	3	St. Peter			
	44		11:29	3				
	45		11:31	2				
	46		11:36	5				
	47		11:42	6				
	48		11:48	6				
	49		11:55	7				
	1250		12:02	7			SAND	
	51		12:10	8				
	52		12:17	7				
	53		12:25	8				
	54		12:30	5				
	55		12:36	6			Sand.	
	56		12:43	7				
	57		12:50	7				
	58		12:57	7				
	59		1:05	8				
	1260		1:12	7				
	61		1:21	8				
	62		1:44	23				Conn @ 1262
	63	1:54	2:05	11				SER R16?
	64		2:15	9				
	65		2:22	7				
	66		2:30	8				
	67		2:38	8				
	68		2:46	8				
	69		2:56	10				
	1270		3:03	7				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 4-25-75

Job AMANA Nordstrom

Hole No. #4

Rig No. Brewster

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1270	1271	3:03	3:10	7			SAND.	
	72		3:15	5				
	73		3:20	5				
	74		3:25	5				
	75		3:31	6				
	76		3:37	6				
	77		3:42	5			SAND.	
1277	78		4:00	18			Prairie du Chien	
	79		4:18	18				
	1280		4:37	19				
	81		4:59	22				
	82		5:17	18				
	83		5:35	18				
	84		5:52	17				
	85		6:12	20				
	86		6:32	20				
	87		6:50	18				
	88		7:05	15				
	89		7:25	20				
	1290		7:45	20				
	91		8:05	20				Conn @ 1291 & L.P.S.
	92	8:20	8:40	20				
	93		9:05	25				
	94		9:30	25				
Now May 23, 1975	95	12:35 AM	12:50	15				UP in P.H.S. FOR WEEK END. Ran Wash 30'
	96		11:07	17				
	97		11:25	18				
	98		1:40	15				
	99		3:00	20				
	1300		3:14	14				

ADDITIONAL REMARKS, ETC.

FUEL OFF @ TANK
CALL FUEL MAN MON. MORN.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date	April 28, 1925
Job	Myra-Madison
Hole No.	#4
Rig No.	Brewster
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1300	1301	9:14	2:35	21			Sandy Sil.	
	02		3:03	28				
	03		3:46	43				
	04		4:12	26				
1305			4:55	43				
	06		5:35	40				
	07		5:55	20				
	08		6:15	20				
	09		6:40	25				
1310			6:55	15			Dolo + Chert.	
	11		7:10	15				
	12		7:24	14				
	13		7:55	31				
	14		8:28	33				
1315			8:47	19				
	16		9:11	24				
	17		9:35	24				
	18		9:50	15				
	19		10:00	10				
1320			10:10	10			Conn @ 1320'	
	21	10:22	10:20	8			P.S. Lev. Rig	
	22		10:28	8				
	23		10:50	12				
	24		11:00	10				
1325			11:13	13				
	26		11:25	12				
	27		11:40	15				
	28		11:56	16				
	29		12:06	10				
1330			12:16	10			MIX GEL & C.P.S.	

ADDITIONAL REMARKS, ETC.

WIN POWER (Mod. D.S. 6518C SR2)

LISTER

VOLTS 125/250 AMPS 52-26

EGSM.

APPROVED BY _____ DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date 4-28-75

Job AMANA Nordstrom

Hole No. #4

Rig No. BREWSTER

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1330	1331	12:55	1:08	13			lime	Dato
	32		1:20	12				
	33		1:35	15				
	34		1:52	17				
	35		2:08	13				
	36		2:15	10				
	37		2:33	18				
	38		2:48	15				
	39		3:05	17				
	1340		3:25	20			Mix	5 sks gel
	41	4:00	4:15	15			25	caustic
	42		4:35	20				
	43		5:00	25				
	44		5:25	25				
	45		5:50	25				
	46	6:25	6:40	15			mix	5 sks gel
	47		7:00	20				
	48		7:30	30				
	49		8:00	30				
	1350		8:30	30				
	51		8:55	25				
	52		9:15	20				
	53		9:35	20				
	54	9:50	10:05	15				conn C.P.S.
	55		10:25	20				PP 400#
	56		10:40	15				
	57		10:55	15				
	58		11:10	15				
	59		11:30	20				
	1360		11:45					

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date	4/29/75
Job	Adams #2787A
Hole No.	4
Rig No.	Shawnee
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1265	1366	11:45	12:05	20				
	67		12:25	20				
	68		12:45	20				
	69		1:10	25				
	1370		1:30	20				
	71							
	72							
	73							
	74							
	1375							
	76							
	77							
	78							
	79							
	1380							
	81							
	82							
	83							
	84							
	1385							
	86							
	87							
	88							
	89							
	1390							
	91							
	92							
	93							
	94							
	1395							

T.O. of 1 3/4" Hole Cnc. 1 hr.
Cut Et Hole To Run Pipe

668-1133

668-2512

43
60

40
30
1200
1300

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER

December 9, 1974

Mr. Donald L. Stoekcer, P.E.
 Howard R. Green Company
 Green Engineering Building
 417 First Avenue, S.E.
 Cedar Rapids, Iowa 52401

Dear Mr. Stoekcer,

I am glad to reply to your letter of December 5 concerning a geological forecast for a Jordan well at the Amana Society Restaurant and Motel (Amana-Nordstrom Company) at their Interstate 80 location in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 5, T. 79 N., R. 9 W., Iowa County.

As you probably know, there are two existing wells at this facility. These are well No. 1 drilled in 1970 and completed in glacial sand and gravel at 100 feet, and well No. 2, drilled in 1972 and completed in the top of the Silurian at 630 feet. Well No. 1 reportedly tested at 60 gpm with a drawdown of only four feet from an original static water level of 46 feet. The water, however, is unsatisfactory containing excess iron and tannic acid. Well No. 2 also yielded water of objectionable quality. The dissolved solids content was analyzed at 2030 parts per million, iron at 5.6 ppm, sodium at 200 ppm, sulfate at 1300 ppm and hardness at 1140 ppm. No data were supplied on the well capacity.

An abbreviated log of the formations penetrated in well to a depth of 630 feet and additional anticipated strata down through the Jordan Sandstone are outlined as follows (all depths are referred to a starting elevation of 795 feet above sea level):

<u>Formation</u>	<u>Depth Range (ft.)</u>
Pleistocene Series (glacial drift clay, includes sand beds at 70-95 feet)	0-165
Pennsylvanian System (shale)	165-241
Devonian System Sheffield Shale	241-340

Mr. Donald L. Stoekoer, P.E.
Page 2
December 9, 1974

Lime Creek (shale and dolomite)	340-460
Cedar Valley Limestone	460-550
Wapsipinicon Formation (limestone dolomite)	550-620
St. Silurian System (dolomite)	620-630
Additional anticipated strata-	
Silurian System (cont'd) (dolomite, contains chert in basal part)	630-720
Ordovician System	
Maquoketa Formation (mostly shale, thin dolomite interbedded, minor chert)	720-935
Galena Formation (dolomite, some chert in lower part)	935-1160
Decorah-Platteville Formations (limestone and dolomite, Glenwood shale at base)	1160-1250
St. Peter Sandstone	1250-1285
Prairie du Chien Formation (dolomite, sandy in upper half, considerable sandstone in middle, much chert, but no sand in lower half)	1285-1720
Cambrian System	
Jordan Sandstone	1720-1810
St. Lawrence Dolomite	1810-1910+

These depth estimates are subject to some error owing to structural and thickness variations of the strata.

On the whole, the Jordan aquifer prospects appear to be good in this vicinity. The aquifer generally will produce in the range of several hundred gallons a minute at specific capacities of 5-10 gpm/ft. of drawdown as in the Iowa City-Coralville area, and the NorthEnglish, Wellman, Brooklyn, and Cedar Rapids-Marion areas. In some places where the formation has been found to be cemented rather tightly the yield has been a disappointment. In this case, considerable development work by acidizing or shooting may be needed to obtain maximum results. The static head of the Jordan is likely to be about 150 feet below the surface, although this prediction could be considerably off. If the well is cased and cemented all the way from the surface into the upper part of the Prairie du Chien, to effectively seal off the highly mineralized waters from the upper and intermediate levels, an acceptable quality water should be obtained. By extrapolation of

Mr. Donald L. Stoekcer, P.E.
Page 3
December 9, 1974

mineral analysis from Jordan wells on the surrounding area the concentration of dissolved minerals should be approximately as shown below:

Total residue (dissolved solids)	1150 ppm
Sulfate	550 ppm
Chloride	40 ppm
Fluoride	1.3 ppm
Hardness as CaCO ₃	475 ppm

This will be a much better water than in the upper bedrock and should be free of the undesirable tannic acid found in the shallow well. However, enough iron may be present in the Jordan water to require treatment to improve the final supply.

I hope this is the information you wished. If this discussion raises any questions or if I can be of additional assistance in any way, please let me know.

Very truly yours,

Paul J. Horick
Chief of Groundwater Geology

PJH:tlb

Actual 5/13/75
TDS 1117 ppm
SO₄ 530
Cl 33
F 1.2
Hard. 464

HOWARD R. GREEN COMPANY

Consulting Engineers

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Phone 319 366-0741 • Green Engineering Building • 417 First Avenue S.E. • Cedar Rapids, Iowa 52401

December 5, 1974

Iowa Geological Survey
16 West Jefferson Street
Iowa City, Iowa 52240

Attention: Mr. Samuel Tuthill,
Director and State Geologist

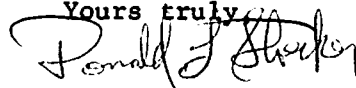
Subject: Amana, Iowa Interstate Facility

Gentlemen:

We have been engaged by the Amana Society to design a Jordan Well for use with their facility located on Highway No. 80. Would you please furnish us with a geological forecast in connection with this project?

We appreciate greatly your assistance and will be happy to cooperate in furnishing information which results from this project.

Yours truly



Donald L. Stoekcer, P.E.

mh

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date *Aug 5, 1925*
 Job *Franklin Ave*
 Hole No. *4*
 Rig No. *1000*
 Tour _____ M _____ M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1370	1371	11:30	11:36	6				
	72		11:45	9				
	73	12:00	12:05	5				
	74		12:10	5				
1375			12:16	6				
	76		12:25	9				
	77	12:35	12:44	9				
	78		12:50	6				
	79		12:59	9				
1380			1:07	8				
	81		1:16	9				
	82		1:25	9				
	83		1:38 1:39	19				
	84		1:57	13				
1385			2:00	9				
	86		2:10	10				
	87		2:20	10				
	88		2:29	9				
	89		2:49	20				
1390			3:01	12				
	91		3:15	14				
	92		3:30	15				
	93		3:43	13				
	94		3:53	10				
1395			4:03	10				
	96		4:11	7				
	97		4:20	9				
	98		4:25	5				
	99		4:32	12				
1400			4:43	6				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date	Apr 2 1955
Job	Wells 109
Hole No.	
Rig No.	100
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1300	1401	4:43	4:49	6				
	02		4:50	6				
	03		5:05	10				
	04		5:12	7				
1405	1405	5:27	5:34	7				1405
	06		5:39	5				
	07		5:43	4				
	08		5:47	4				
	09		5:55	8				
1410			6:06	11				
	11		6:15	9				
	12		6:23	8				
	13		6:35	12				
	14		6:46	10				
1415			6:50	5				
	16		7:00	10				
	17		7:06	6				
	18		7:14	8				
	19		7:23	9				
1420			7:31	8				
	21		7:36	5				
	22		7:44	8				
	23		7:50	6				
	24		7:58	8				
1425			8:03	5				
	26		8:09	6				
	27		8:15	6				
	28		8:21	6				
	29		8:27	6				
1430			8:30	3				

ADDITIONAL REMARKS, ETC.

APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date *May 27 1905*

Job *Repair Abandoned*

Hole No. *3*

Rig No. *1*

Tour *M M*

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
<i>1430</i>	<i>1431</i>	<i>8:30</i>	<i>8:35</i>	<i>5</i>			<i>Sh. of L. etc</i>	
	<i>32</i>		<i>8:39</i>	<i>4</i>				
	<i>33</i>		<i>8:42</i>	<i>3</i>				
	<i>34</i>		<i>8:47</i>	<i>5</i>				
	<i>1435</i>		<i>8:53</i>	<i>6</i>				
	<i>36</i>	<i>9:02</i>	<i>9:07</i>	<i>5</i>				
	<i>37</i>		<i>9:11</i>	<i>4</i>				
	<i>38</i>		<i>9:15</i>	<i>4</i>				
	<i>39</i>		<i>9:18</i>	<i>3</i>				
	<i>1440</i>		<i>9:21</i>	<i>3</i>				
	<i>41</i>		<i>9:25</i>	<i>4</i>				
	<i>42</i>		<i>9:29</i>	<i>4</i>				
	<i>43</i>		<i>9:33</i>	<i>4</i>				
	<i>44</i>		<i>9:37</i>	<i>4</i>				
	<i>1445</i>		<i>9:41</i>	<i>4</i>				
	<i>46</i>		<i>9:45</i>	<i>4</i>				
	<i>47</i>		<i>9:48</i>	<i>3</i>				
	<i>48</i>		<i>9:51</i>	<i>3</i>				
	<i>49</i>		<i>9:54</i>	<i>3</i>				
	<i>1450</i>		<i>9:56</i>	<i>2</i>				
	<i>51</i>		<i>10:00</i>	<i>4</i>				
	<i>52</i>		<i>10:05</i>	<i>5</i>				
	<i>53</i>		<i>10:10</i>	<i>5</i>				
	<i>54</i>		<i>10:15</i>	<i>5</i>				
	<i>1455</i>		<i>10:19</i>	<i>4</i>				
	<i>56</i>		<i>10:25</i>	<i>6</i>				
	<i>57</i>		<i>10:30</i>	<i>5</i>				
	<i>58</i>		<i>10:34</i>	<i>4</i>				
	<i>59</i>		<i>10:39</i>	<i>5</i>				
	<i>1460</i>		<i>10:44</i>	<i>5</i>				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date May 5, 1975
 Job A-11 A-11
 Hole No. 1
 Rig No. 71-4
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1460	61	10:44	10:50	6			lime	30 yds
	62		10:55	5				Testing fluid
	63		11:00	5				
	64		11:06	6				
	65		11:12	6				
	66		11:22	10			lime	
	67		11:30	8				
	68	11:52	11:57	5				down slow Rig
	69		12:01	4				
1470			12:05	4				
	71		12:30	25				
	72		12:44	14				
	73		12:57	13				
	74		1:10	13				
	75		1:20	10				
	76		1:27	7				
	77		1:34	7				
	78		1:42	8				
	79		1:49	8				
1480			1:57	8				
	81		2:05	8				
	82		2:15	10				
	83		2:25	10				
	84		2:35	10				
	85		2:45	10				
	86		3:00	15				
	87		3:15	15				
	88		3:25	10				
	89		3:35	10				
1490			3:45	10			SN Dol.	

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 5-5-75

Job *Anna No. 5 Term*

Hole No. *1*

Rig No. *Linnaker*

Tour M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
<i>1490</i>	<i>1491</i>	<i>3:45</i>	<i>3:55</i>	<i>10</i>				
	<i>92</i>		<i>4:04</i>	<i>2</i>				
	<i>93</i>		<i>4:14</i>	<i>10</i>				
	<i>94</i>		<i>4:24</i>	<i>10</i>				
	<i>95</i>		<i>4:39</i>	<i>15</i>				
	<i>96</i>		<i>4:55</i>	<i>16</i>				
	<i>97</i>		<i>5:10</i>	<i>15</i>				
	<i>98</i>		<i>5:25</i>	<i>15</i>				
	<i>99</i>	<i>5:32</i>	<i>5:38</i>	<i>6</i>				<i>2. 3 11/2</i>
	<i>1500</i>		<i>5:43</i>	<i>5</i>				
	<i>01</i>		<i>5:49</i>	<i>6</i>				
	<i>02</i>		<i>6:05</i>	<i>16</i>				
	<i>03</i>		<i>6:30</i>	<i>25</i>				
	<i>04</i>		<i>6:45</i>	<i>15</i>				
	<i>05</i>		<i>7:00</i>	<i>15</i>				
	<i>06</i>		<i>7:15</i>	<i>15</i>				
	<i>07</i>		<i>7:32</i>	<i>17</i>				
	<i>08</i>		<i>7:45</i>	<i>13</i>				
	<i>09</i>		<i>7:54</i>	<i>9</i>				
	<i>10</i>		<i>8:05</i>	<i>11</i>				
	<i>11</i>		<i>8:20</i>	<i>15</i>				
	<i>12</i>		<i>8:35</i>	<i>15</i>				
	<i>13</i>		<i>8:50</i>	<i>15</i>				
	<i>14</i>		<i>9:10</i>	<i>20</i>				
	<i>15</i>		<i>9:25</i>	<i>15</i>				<i>Hooking up. Pic Comp</i>
	<i>16</i>	<i>11:15</i>	<i>11:30</i>	<i>5</i>				
	<i>17</i>		<i>11:25</i>	<i>5</i>				
	<i>18</i>		<i>11:31</i>	<i>6</i>				
	<i>19</i>		<i>11:32</i>	<i>6</i>				
	<i>20</i>		<i>11:43</i>	<i>10</i>				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date *June 19, 1955*

Job *Hydrofracturing*

Hole No. *4*

Rig No. *1000*

Tour *M*

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1520	1521	11:43	11:47	4				
	22		11:51	4				
	23		11:55	4				
	24		11:59	4				
	1,525		12:03	4				
	26		12:07	4				
	27		12:10	3				
	28	12:26	12:30	4				<i>Core @ 1,525'</i>
	29		12:36	6				
	1,530		12:41	5				
	31		12:46	5				
	32		12:50	4				
	33		1:06	16				
	34		1:15	9				
	1,535		1:26	11				
	36		1:40	14				
	37		1:55	15				
	38		2:05	10				
	39		2:15	10				
	1,540		2:26	11				
	41		2:39	13				
	42		2:53	14				
	43		3:05	13				
	44		3:20	15				
	1,545		3:32	12				
	46		3:45	13				
	47		3:58	13				
	48		4:10	12				
	49		4:14	4				
	1,550		4:20	6				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date May 6, 1976
 Job ADIANA
 Hole No. 1
 Rig No. 7-1
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
16	10	1:13	1:17	4				
	12		1:21	4				
	13		1:26	5				
	14		1:30	4				
	15		1:35	5				
	16		1:45	10				
	17		1:57	12				
	18		2:09	12				
	19	2:33	2:44	11				
	20		2:49	15				
	21		2:10	13				
	22		2:18	8				
	23		2:35	17				
	24		3:55	20				
	25		4:03	8				
	26		4:12	9				
	27		4:20	8				
	28		4:35	15				
	29		4:52	17				
	30		5:10	18				
	31		5:10	10				
	32		5:20	10				
	33		5:30	10				
	34		5:40	10				
	35		5:50	10				
	36		6:00	10				
	37		6:15	15				
	38		6:35	20				
	39		7:00	25				
	40		7:20	20				

C.O.M.

Dole & Co.

ADDITIONAL REMARKS, ETC.

APPROVED BY _____

DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date	May 6, 75
Job	Indiana Regulation
Hole No.	#4
Rig No.	Quinton
Tour	M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1640	1641	7:20	7:29	9			Sly Soil	
	42		7:38	9			Y. Green	
	43		7:47	9				
	44		7:56	9				
	45		8:05	9				
	46		8:15	10				
	47		8:30	15				
	48		8:44	14				
	49		8:53	9				
1650	9:10	9:20	10					Down @ 1649'
	51		9:33	13				
	52		9:50	17				
	53		10:00	10				
	54		10:13	13				
	55		10:28	15				
	56		10:45	17				
	57		11:03	18				
	58		11:23	20				
	59		11:40	17				
1660			11:52	12				
	61		12:12	20				
	62		12:30	28				
	63		12:00	30				
	64		1:40	40				
	65		2:20	40				
	66		2:50	30				
	67		3:20	30				
	68		3:50	30				
	69		4:20	30	3			
1670			4:50	30				

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____ DRILLER _____

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date May 7 1975
 Job Water well
 Hole No. 72
 Rig No. B...
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1670	1671	4:50	5:10	20			Dolo + Chert	
	72		5:30	20				
	73		5:50	20				
	74		6:22	22				
	1675		6:31	21			Dolo + Chert	
	75		6:49	16				
	77		7:01	16				
	78		7:16	15				
	79		7:31	15				
	1680		7:49	18				Conn. @ 1680
	81	8:03	8:12	10				
	82		8:21	9				
	83		8:29	8				
	84		8:37	8				
	1685		8:45	8				
	86		8:56	11				
	87		9:03	7				
	88		9:13	10				
	89		9:21	8				
	1690		9:34	13				
	91		9:44	10				
	92		9:59	15				
	93		10:16	12				
	94		10:20	9				
	1695		10:25	5			OUT OF FLUID - HAULING WATER	
	96	12:38	12:46	8				
	97		1:04	18				
	98		1:27	23				
	99		1:38	11				
	1700		2:00	22				

ADDITIONAL REMARKS, ETC.

APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 5-7-75

Job *Recessed*

Hole No. #1

Rig No. *Greenston*

Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1700	1701	2:00	2:12	12				
	02		2:23	16				
	03		2:36	8				
	04		2:43	7				
	1705		2:53	10				363-5196
	06		3:01	8				
	07		3:06	5				
	08		3:10	4				
	09		3:23	15				
	1710		3:37	12				Cont @ 1710
	11	4:05	4:18	13				
	12		4:26	8				
	13		4:34	8				
	14		4:47	13				
	1715		4:52	5				
	16		4:57	2				
	17		4:57	3				
	18		4:59	2				
	19		5:02	3				
	1720		5:06	4				
	21	2:10	2:14	4				come up hole Air lift / water
	22		2:21	7				
	23		2:27	6				
	24		2:39	12				
	1725		2:50	11				
	26		3:15	20				
	27		3:34	19				
	28		3:46	12				
	29		3:52	7				
	1730		4:05	13				

Free H₂O / H₂O / H₂O

1 ME H₂NO₃ 250 = 50 PPM

Less than 1 mL VS = 50 PPM

PPM X 1.41 = 70.5 AS CaCO₃

ADDITIONAL REMARKS. ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date July 3 1975
 Job Aspen No. 1
 Hole No. 1
 Rig No. 13
 Tour M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1.550	1.551	4:20	4:27	7				
	52		4:34	7				
	53		4:45	11				
	54		4:55	10				
	1.555		5:05	10				
	56		5:22	17				
	57		5:35	13				
	58	5:50	5:57	7				Change @ 1.557
	59		6:05	8				
	1.560		6:12	7				
	61		6:20	8				
	62		6:30	10				
	63		6:40	10				
	64		6:50	10				
	1.565		6:55	5				
	64		7:01	6				
	67		7:02	6				
	68		7:19	12				
	69		7:25	6				
	1.570		7:33	8				
	71		7:40	7				
	72		7:45	5				
	73		7:50	5				
	74		7:54	4				
	1.575		7:58	4				
	75		8:03	5				
	77		8:05	4				
	78		8:12	5				
	79		8:16	5				
	1.580		8:23	7				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date *U.S.C. May 7, 1925*

Job *Figure 2503804*

Hole No. *1*

Rig No. *P. 2503804*

Tour *M M*

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
<i>1580</i>	<i>1581</i>	<i>8:23</i>	<i>8:29</i>	<i>6</i>			<i>lime</i>	<i>Do 6</i>
	<i>82</i>		<i>8:38</i>	<i>9</i>				
	<i>83</i>		<i>8:47</i>	<i>9</i>				
	<i>84</i>		<i>8:53</i>	<i>6</i>				
	<i>1585</i>		<i>8:58</i>	<i>5</i>				
	<i>86</i>		<i>9:10</i>	<i>12</i>				<i>lime 2 2056'</i>
	<i>87</i>	<i>9:22</i>	<i>9:32</i>	<i>4</i>				
	<i>88</i>		<i>9:35</i>	<i>3</i>				
	<i>89</i>		<i>9:39</i>	<i>4</i>				
	<i>1590</i>		<i>9:43</i>	<i>4</i>				
	<i>91</i>		<i>9:47</i>	<i>4</i>				
	<i>92</i>		<i>9:51</i>	<i>4</i>				
	<i>93</i>		<i>10:00</i>	<i>9</i>				
	<i>94</i>		<i>10:15</i>	<i>15</i>				<i>Blue Hole</i>
	<i>1595</i>	<i>11:25</i>	<i>11:34</i>	<i>9</i>				
	<i>96</i>		<i>11:44</i>	<i>10</i>			<i>lm - chert</i>	
	<i>97</i>		<i>11:55</i>	<i>11</i>				
	<i>98</i>		<i>12:08</i>	<i>13</i>				
	<i>99</i>		<i>12:20</i>	<i>12</i>				
	<i>1600</i>		<i>12:30</i>	<i>10</i>				
	<i>101</i>		<i>12:35</i>	<i>5</i>			<i>lime</i>	
	<i>102</i>		<i>12:40</i>	<i>5</i>				
	<i>103</i>		<i>12:45</i>	<i>5</i>				
	<i>104</i>		<i>12:50</i>	<i>5</i>				
	<i>1605</i>		<i>12:53</i>	<i>3</i>				
	<i>106</i>		<i>1:00</i>	<i>3</i>				
	<i>107</i>		<i>1:05</i>	<i>5</i>				
	<i>108</i>		<i>1:08</i>	<i>3</i>				
	<i>109</i>		<i>1:11</i>	<i>3</i>				
	<i>1610</i>		<i>1:13</i>	<i>2</i>				

ADDITIONAL REMARKS, ETC.

APPROVED BY _____ DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date	Mar 9, 1958
Job	Frank Jones
Hole No.	44
Rig No.	7000
Tour	M M M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1790	1791	7:31	7:48	13				
	92		8:02	14				
	93		8:15	13				
	94		8:28	13				
	1795		8:35	11				Total depth 1795'
	96							
	97							
	98							
	99							
	1800							
	01							
	02							
	03							
	04							
	1805							
	06							
	07							
	08							
	09							
	1810							

ADDITIONAL REMARKS, ETC. _____

APPROVED BY _____

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237 DUBUQUE, IOWA 52001

Date 5-8-75

Job *Clinton No. 1*

Hole No. #4

Rig No. *B...*

Tour M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1730	31	4:05	4:10	5				
	32		4:15	5				
	33		4:22	7				
	34		4:30	8				
	35		4:37	7				
	36		4:45	8				
	37		4:53	8				
	38		5:00	18				
	39		5:45	3.5				
	1740		6:05	20				
	41	6:25	6:52	7				
	42		6:45	13				
	43		6:52	10				
	44		7:00	5				
	1745		7:03	3				
	46	10:55	10:58	3				Blow up sample
	47		11:02	4				
	48		11:06	4				
	49		11:10	4				
	1750		11:14	4				
	51		11:18	4				
	52		11:23	5				
	53		11:27	4				
	54		11:32	5				
	1755		11:36	4				
	56		11:40	4				
	57		11:45	5				
	58		11:50	5				
	59		11:55	5				
	1760		12:00	5				

ADDITIONAL REMARKS, ETC.

DRILLED BY

DRILLER

DAILY DRILLING REPORT

VARNER WELL AND PUMP CO.

BOX 237

DUBUQUE, IOWA 52001

Date

Job

Hole No.

Rig No.

Tour

M

M

DEPTH		TIME START	TIME FINISH	MINUTES	MUD VISCOSITY	MUD WEIGHT	FORMATION	REMARKS
FROM	TO							
1760	61	12:18	12:22	4			Sand	
	62		12:26	4				
	63		12:30	4				
	64		12:35	5				
	65		12:39	4				
	66		12:44	5				
	67		12:48	4				
	68		12:52	4				
	69		12:57	5				
	1770		12:02	5				
	71	5:30	5:33	3				Can't Airbit
	72		5:36	3				Repair air line
	73		5:38	2				Sample #3
	74		5:43	5				
	75		5:49	6				
	76		5:55	6				
	77		6:00	5				
	78		6:06	6				
	79		6:12	6				
	1780		6:23	11				
	81		6:32	9				
	82		6:36	6				
	83		6:41	5				
	84		6:47	6				
	85		6:52	5			Sand	
	86		7:00	8				
	87		7:07	7				
	88		7:13	6				
	89		7:22	9				
	1790		7:35	13				

ADDITIONAL REMARKS, ETC.

APPROVED BY

DRILLER

5-15-75

Don,

State Hygienic Lab called:
Iron Figures for your Analysis were!

Amana-Nordstrom (sample #1) (First sample sent in)

Fe Concentration: 0.95 (1720' depth)

Amana-Nordstrom (sample #2)

Fe Concentration: 0.45 (1795' depth)

VARNER WELL AND PUMP CO. *Established 1906*

WATER WELLS - DEEP WELL PUMPS - WELL REPAIRS - SOUNDINGS

Contractors

TELEPHONE: AREA CODE 319 583-8226
P. O. BOX 237-121 E. 4TH STREET
DUBUQUE, IOWA 52001

May 14, 1975

Iowa Geological Survey
16 West Jefferson Street
Iowa City, Iowa 52242

Attn: Donald L. Koch
Acting Assistant State Geologist

Dear Don:

Enclosed is the information you requested on the Amana-Nordstrom Well, which includes copies of time sheets, and pumping test records.

Casing Record:

16" Surface Casing	-	0-170' (Grouted)
8" I.D. Casing, T & C	-	+3-1,365'
3" Casing	-	Pressure grouted with 987 sacks of cement

The chloride content remained at less than 50 ppm chlorides at all 25' tests.

Trusting this information will be helpful to you, we remain

Yours truly,

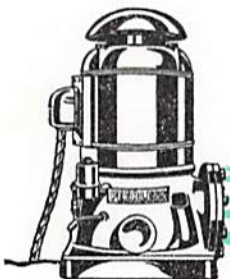
VARNER WELL & PUMP CO.

Bill
William A. McEllhiney, Jr.
President

cn
Encl.

*Location as plotted on Conroy topo sheet by DK:
SE SE NE NE 5-79N-9W*

(DISTRIBUTORS OF PEERLESS PUMPS)



Amann - Nordstrom Co.
Holiday Inn - I-80

Loc. SE SE NE NE S-79-9W, Iowa County

Completed: Mar 1975

EI. 797' (topo map)

T.D. 1795'

Original SWL 196' PWL 274' @ 530 gpm (6.8 sp. cap.)

186'

Loc. ~ 100' N and ~ 250 west of
SE cor. of property.

5-12-75

Bud Tiewell (Varner Well Co.) delivered four quart-size water samples from the following depths in the Amana-Nordstrum well:

1720 - 50 ppm Cl (Hach kit)

1745

1770

1795 - Total depth
Top St. Law ~ 1782' (driller)

Bill McElhiney didn't call to tell us they were ready to start the drill-test sample program.

The duration pumping test is scheduled to begin 5-13-75.

I sent ^{only} the 1720 foot ^{water} sample to Hygienic Lab for analysis. I will visit the site 5-13-75 to collect a full-size sample for analysis.

5-14-75

The Planned 24 hr. duration ^{pumping test} was started at ~ 7:00 PM 5-12-75 and terminated at 11:00 AM,

on 5-13-75. I arrived at 2:00 PM 5-13-75 and had to settle for a water sample collected by the driller. I wrote to Varner for the pumping test data - partial information was obtained from Don Stocker when he called today to ask if we could get a fast determination on iron in the water:

Original SWL at 1795' depth = 196'

	<u>Time</u>	<u>PL</u>	<u>DD</u>	<u>Rate</u>	<u>Spl</u>
5-12-75	7:00 PM - 12:00 AM	227	31	270 gpm	8.7
	12:00 AM - 3:30 AM	245	49	425	8.67
	3:30 AM - 11:00 AM 5-13-75	274	78	530	6.79

No data on recovery rate.

Final SWL (full recovery) = 188'

Original contract called for acidizing if necessary, and the cost for 2,000 gal. acid was included in the project price. Because acidizing was unnecessary, the price was deducted.

D

VARNER WELL & PUMP CO.
DUBUQUE, IOWA

WELL TEST DATA SHEET

By **Amana Colonies**
Location **Holiday Inn**

Date tested **May 12, 13, 1975**
Performed by **Varner Well & Pump Co.**

Dia. of well **8" I.D.**
Depth of well **1,795'**
Length of casing **305'**
From pump to level **202'**
Casing size **10" x 6 1/2"**

Pump make & model **1091 International**
Casing size **6" x 1 1/2"**
Speed **8 HX**
Motor make **Peerless**
Serial No.

TIME	WELL HEAD PRESSURE (PSI)	WELL HEAD PRESSURE (PSI)	WELL HEAD PRESSURE (PSI)	WELL HEAD PRESSURE (PSI)	WELL HEAD PRESSURE (PSI)	WELL HEAD PRESSURE (PSI)
7:00		202	202			
7:15	270	232	232	30		
7:30	270	233	233	31		
7:45	270	233	233	31		
8:00	270	233	233	31		
8:30	270	233	233	31		
9:00	270	233	233	31		
9:30	270	233	233	31		
10:00	270	233	233	31		
10:30	270	233	233	31		
11:00	270	233	233	31		
11:30	270	233	233	31		
12:00	270	233	233	31		
12:30	425	251	251	49		Inc. Pump. Rate
1:00	425	251	251	49		
1:30	425	251	251	49		
2:00	425	251	251	49		
2:30	425	251	251	49		
3:00	425	251	251	49		
3:30	530	280	280	78		Inc. Pump. Rate
4:00	530	280	280	78		
4:30	530	280	280	78		
5:00	530	280	280	78		
5:30	530	280	280	78		
6:00	530	280	280	78		

VARNER WELL & PUMP CO.
DUBUQUE, IOWA

WELL TEST DATA SHEET

Job **Amana Colonies**

Date tested **May 13, 1975**

Location **Holiday Inn**

Tested by **Varner Well & Pump Co.**

Size of well **8"**

Pump used **1091-Int.**

Depth of well **1,795'**

Motor size **6" x 1½"**

Length of airline **305'**

Power **8 HX**

Current pumping level **186' G.L.**

Manufacturer **Peerless**

Orifice size **10" x 6½"**

Serial No.

TIME	WATER DEPTH (FEET)	CH. M.	AIR GAUGE READING (FEET)	PUMPING LEVEL	DRAW DOWN	WELL PRESSURE (PSI)	TEMP. (DEGREES F)	REMARKS
6:30	0	0	202		0	0		START OF TEST
7:00	10½	530	280	280	78'			Increase Pumping Rate
7:30	10½	530	280	280	78'			
8:00	10½	530	280	280	78'			
8:30	10½	530	280	280	78'			
9:00	10½	530	280	280	78'			
9:30	10½	530	280	280	78'			
10:00	10½	530						Airline Failed
10:30	10½	530						
11:00	10½	530						
11:30								Shutdown
								188' S.L. From Ground Level

Suc 80 Newt set
 3 hrs @ 25 gpm, draws down to screen
 2:30 30 gpm PL 97, started sucking air
 3:10 25 gpm lowered pump 1 1/2', PL 97
 5:30 25 gpm 97' PL

Holiday Inn, at Little Amana
 Buck White

? to spend 150,000 for Jordan or get by
 w/ present supply - water level dropping
 in shallow sd

Holiday = pumping 35 gpm combined from #1 + 2
 Colony Complex (SE quadrant) = 5 wells pumping, 30 gpm each, no
 4 Latta problems; use only water softener
 1 Gingersich pumping 16 hrs, used 30,000 gal/day (31 gpm)

cuttings < well #1 (drillers log record) original SWL = 64'
 100' deep deep
 pumping about < 25 gpm now = 79' PL = 95?
 no cuttings < #2 = 111' deep (restaurant well on hill) = 72
 Aug. 1970 clogged screen now = 93 PL = 101?
 drawing
 45 gpm pump in #1 + #2
 pumping 11 gpm

Louie just acid in #2 (thought he)

(Oct. 1974)
 New test hole, Suc = 80' 98' to top screen
 5' of screen

can check both wells for water level
 Use Dav. well on weekend to augment supply.
 Owners want to wait 5 to 7 yrs before
 drill Jordan well.

45 from 1 well, 50 from another originally

Don Schoup - Bill Nordstrom (Phillips 66)

1:00 Monday

Call from Buck White
10-8-79

Neil Fisher

Tannin problem at Holiday Inn, Amara Soc, I-80

tannin have an OH

5/2/80



^{Dogherty} John was involved when methane gas was a problem.

softener unit adds hydroxide & raises pH, then tannin color will really show

Call Dogherty - Fanner

Howard proposed

5 holes

10-9-79

tannin

tannin + lignin

gallic acid
tannic acid

glucose ring, build up
dextrose
hydrate

hydroxylated benzene
activated charcoal

polyelectrolytes
coagulation

I.C. treatment

(ferrous sulfate)

tannin + Fe =

old granddaddy's ink (indelible)

~~FeSO₄~~ = greenish, astringent
if Dev. water = low pH, would precipitate as ferric oxide

iron precipitate as ferric oxide ^{tannin} ~~is~~ in solution

772
357
23

840
100
680

Howard & Buck called back 10-9-79

Holiday Inn, I-80 Amana

~~BH Buckley~~

1. overpumping system - probably lot of encrustation - may improve sit. temporarily by pulling both screens and cleaning
2. Test pumping - would need to shut down both shallow wells for about 1 week & use only Devs supply - get recovery measurements until stabilize (probably 2-3 days) then test pump for day or 2 - get water levels from

795-8696

Verbes Skelly Oil Co.

SE, SE Sec. 32, 80-9W
~~SW, NW Sec. 9, 79-9W~~

Dec. 1966

- 0-70 Till
- 70-73 clayey silt, brn-gr, w/ comminuted plant mat. & wood frags.
- 73-85 sd
- 85-90 Till
- 90-103 dirty sand

102' of 5" pipe, slotted

SWL 60'?

PL 20' @ 20 gpm

Lotta-Amana-Holiday Inn

NE NE 5-79-9W

0-20 Till, oxid

10' sample interval

20-70 Till, unoxid, unchd

70-90 dirty sd; contains brn-gr. clayey silt w/ comminuted plant mat. & woody frags w/in or at top of interval.

90-165 Till, unoxid, unchd.

165-220 Penn. sh

220-340 Sheff 465' of 8" cas.

340-450 L.C. SWL —

450-550 C.V PL — @ —

550-590 Wapoi

590-630 TD Sil.

9/28/72 2030 TDS .56 Fe 260 Ca 115 Mg 17 K 200 Na

256 HCO₃ 1300 SO₄ 12 Cl .75 F

1140 hardness as CaCO₃

(see)

| 100

top hill, behind Inn

2 test ^{far west} _{corner} sd 127-132

20' sq 2 sd 137-145; sd 285-290; sh @ 300'

top other knoll 150's; no sd, block sh @ 230'

out in front? no 6 & 7

fo sd 95-103

JOINT PUBLIC NOTICE
U.S. ENVIRONMENTAL PROTECTION AGENCY
AND
IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY
APPLICATION FOR NPDES AUTHORIZATION TO DISCHARGE

LITTLE AMANA

Public Notice No. IA-75-465

Date: July 9, 1975

Permit No. IA-0024121

In accordance with the National Pollutant Discharge Elimination System, Little Amana, Amana, Iowa 52203 has applied for an authorization to discharge into Clear Creek.

The applicant is engaged in operating a motel, restaurant, winery and retail stores complex.

Their Standard Industrial Classification Codes are 5812, 5813, 7011 and 7542.

This permit does NOT approve a new or additional discharge. It is being issued on an existing discharge, and is consistent with applicable water quality standards, effluent guidelines or best practicable treatment for this industry.

On the basis of preliminary staff review and application of lawful standards and regulations, the State of Iowa intends to certify pursuant to Section 401 of the Federal Water Pollution Control Act Amendments of 1972, and the U.S. Environmental Protection Agency, Region VII, proposes to issue a permit to discharge pursuant to Section 402 of the Federal Water Pollution Control Act Amendments of 1972, subject to certain effluent limitations and special conditions.

General information regarding the discharge and special conditions is given below:

Current Discharge Description

Average flow: Under 50,000 gallons per day

Nature of discharge: Discharge from lagoon.

Effluent Limitations and Monitoring Program

<u>Effluent Characteristic</u>	<u>Discharge Limitation</u> kg/day (lbs/day)		<u>Other Units (Specify)</u>		<u>Monitoring Requirements</u>	
	<u>Daily Average</u>	<u>Daily Maximum</u>	<u>Daily Average</u>	<u>Daily Maximum</u>	<u>Measure-ment Frequency</u>	<u>Sam-ple Type</u>
Flow-m ³ /day (MGD)	N/A	N/A	N/A	N/A	Once/Quarter	Meter or Estimate
Total Suspended Solids	N/A	N/A	30 mg/l	45 mg/l	Once/Quarter	Grab
BOD (5-day)	N/A	N/A	30 mg/l	45 mg/l	Once/Quarter	Grab
Fecal Coliform	N/A	N/A	200/100 ml	400/100 ml	Once/Quarter	Grab
pH			6.0 minimum - 9.0 maximum		Once/Quarter	Grab

These proposed determinations are tentative. Persons wishing to comment upon or object to the proposed determinations are invited to submit them in writing to:

Chief
Permit & Compliance Branch, Region VII
U.S. Environmental Protection Agency
1735 Baltimore
Kansas City, Missouri 64108
(816-374-3171)

All comments received prior to August 8, 1975 will be considered in the formulation of final determinations regarding this application. Please refer to the above listed application and public notice numbers in preparing your comments. If no objections are received prior to August 8, 1975 the Regional Administrator will issue his final determination within 60 days of the date of this public notice. If response to this notice indicates significant public interest, a public hearing may be held.

The application, proposed permit, including proposed effluent limitations and special conditions, fact sheets, as applicable, comments received and other information are on file and may be inspected at the U.S. Environmental Protection Agency Library, Public Documents Room, 1735 Baltimore, Kansas City, Missouri 64108, any time between 7:15 a.m. and 4:00 p.m., Monday through Friday. These documents are available upon request at a cost of \$.20 per page. Additional copies of this public notice are available at the U.S. Environmental Protection Agency Library (816-374-5828) and Iowa Department of Environmental Quality, 3920 Delaware, Des Moines, Iowa 50316 (515-265-8134).

No acidization *Amara - Nordstrom*

original SWL 196'

270	gpm	=	31'	dd
425	"	=	49	
530		=	78	stabilized

Hach kit = 50 ppm Cl

6.8 gpm / ft dd sp. cap.
$$\begin{array}{r} 78 \overline{) 530.0} \\ \underline{468} \\ 620 \\ \underline{624} \end{array}$$

3-12-75

Ken Lyons (INRC) called to see if we had any data on the Jordan aquifer near the Holiday Inn at Little Amana I-80 Exchange (Iowa County). The closest wells are Iowa City-Coralville and North English, about equidistant, for which INRC has info.

INRC is holding a public hearing for a Jordan withdrawal permit this week.

~~and~~

The Engineer is reported to be Howard Green Eng'g, Cedar Rapids.



IOWA GEOLOGICAL SURVEY

Receipt of Delivery

Nº

7

To be delivered to:

Don Koch

Description of item(s) delivered:

*Water sampler
4 bottles
from Amara*

1695 - 50 cl

1720 - 50 cl

1745

1770

1795 - TD

Delivery from:

*Warner Well Co
Dubuque Iowa
Amara Well*

Company making delivery:

*Bud
Warner Well Co*

Received by: *Bud Abbott*

Date: *May 12 - 1975*

5-13-75

Mr. William McElhiney
Varner Well & Pump Co
Box 237
Dubuque, Iowa

Consequently, I forwarded only the ~~1720~~ 1720 foot sample to the State Hygienic Laboratory for a full mineral analysis.

Dear Bill

I presume that ~~is~~ ^{was found} no significant variation in the chloride ion concentration of water from the Amana-Nordstrom Co. well during the 25-foot increment drilling and water testing program. ←

Because of the early termination of the duration pumping test ~~on 5-13-75~~ on 5-13-75 I did not personally collect a water sample, but I did pick up a sample recovered by your crew and forwarded it to the Hygienic Laboratory.

Please send me the following information:

- 1) Drill time sheets for the interval 1370-1795
- 2) Complete casing and grouting record
- 3) Data on chloride concentration measured during the 25-foot increment drilling and water testing program.
- 4) Complete pumping test record and

recovery record.

Thank you for your ~~help~~ cooperation. Perhaps I will have the opportunity to reciprocate.

Sincerely

DLK
CSG

Drill problems

BLUE

Lost circulation 676 - ~ 655
(~ top Silurian)

Shale squeezing in slightly at 730'

Minor loss circulation at 915

4-29-75

I stopped at the Amana - Nordstrom Co. site - 8 5/8" ID csg. had been set (0-1365') and they were ready to cement; cementing completed at 7:00 PM; ~ 990 sack equivalent brought by 2 trucks from Davenport.

Drilling will resume after cement sets for 72 hrs.

Drilling in Jordan will proceed at 25-foot intervals, with water tested for chloride content after each 25 feet. SWL of Jordan expected to be 150-200 feet - they will pull 7 lengths of drill stem (420 feet), put on a perforated length of drill stem, go back in hole, and air-lift water for sampling (lift water for ~ 1 hr. before sampling). Bill McElhiney will call Gus when they are ready to start the first air-lift. Q

Present at site :

Bill McElhiney - Varner Well Co.

Bud Tiewell - " " "

Don Stoekcer - Green Engineering

Don Koch - I G S