



BROWN, ERDMAN & ASSOCIATES LTD.

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PRODUCTION WELL

ENDERBY I.R.2

for

STANLEY ASSOCIATES ENGINEERING LTD.

by

H. W. REED, P. ENG.

December 1979

79-152

INTRODUCTION

Drilling of a test well at Enderby I.R.2 was started in early November 1979.

The first hole drilled to a depth of 200 feet was abandoned when the casing could not be withdrawn. A second hole was completed as a production well with a screen set in water-bearing sand at a depth of 129 feet.

Aquifer testing was completed December 14th and shows the well to have a safe productive yield of 60 USgpm.

WELL CONSTRUCTION

The first hole was drilled to a total depth of 200 feet and penetrated the sediments noted on the attached log. A fine to medium water-bearing sand was encountered between depths of 113 and 129 feet and proved to be the only zone capable of development in the hole. Sieve analyses of this sand indicated an optimum well screen slot size of 0.015 inches and at that time the productive capacity of the sand was estimated to be approximately 20 gpm.

In order to develop the aquifer it was necessary to pull the 8-inch diameter casing from a depth of 180 feet back to 129 feet. Several days were spent using two 200 ton hydraulic jacks but the casing became stuck in the lower till and could not be withdrawn above a depth of 155 feet. Further attempts to cut the casing below 129 feet by blasting were also unsuccessful and the hole had to be abandoned after 100 feet of casing had been recovered.

A new hole was then drilled to a depth of 129 feet and 12 feet of 6-inch diameter well screen was set at the bottom. The 8-inch diameter casing was withdrawn to a depth of 115 feet and the aquifer was developed by surging and bailing.

AQUIFER TESTING

A submersible pump was set on December 13th and the well was tested for 1400 minutes (one day). At pumping rates of 52, 69 and 73 USgpm the well quickly reached near stable pumping levels making an accurate calculation of transmissivity impossible. However, the specific capacity of the well at these pumping rates was 1.6 USgpm per foot of drawdown and experience indicates that a transmissivity in the order of 3200 USgpd per foot is reasonable.

A water sample was collected at the end of the test and submitted to a commercial laboratory for inorganic chemical analysis, the results of which will be forwarded when completed.

WELL PRODUCTIVE CAPACITY

The well was pumped at rates of 52, 69 and 73 USgpm with drawdowns of 32.4, 43.1 and 45.4 feet respectively. The specific capacity calculated for each pumping rate is 1.6 USgpm per foot of drawdown.


The well yield is therefore calculated as follows:

Top of screen assembly	112.8 feet
Static water level (below ground)	<u>54.5 feet</u>
Total available drawdown	58.3 feet
Less pump submergence	<u>5 feet</u>
Total useable drawdown	53.3 feet
Safety allowance	<u>16 feet</u>
Total safe drawdown	<u>37.3 feet</u>

Well rating: 37.3 feet x 1.6 USgpm per foot = 60 USgpm.

The safety factor against water table fluctuation and decline is therefore:

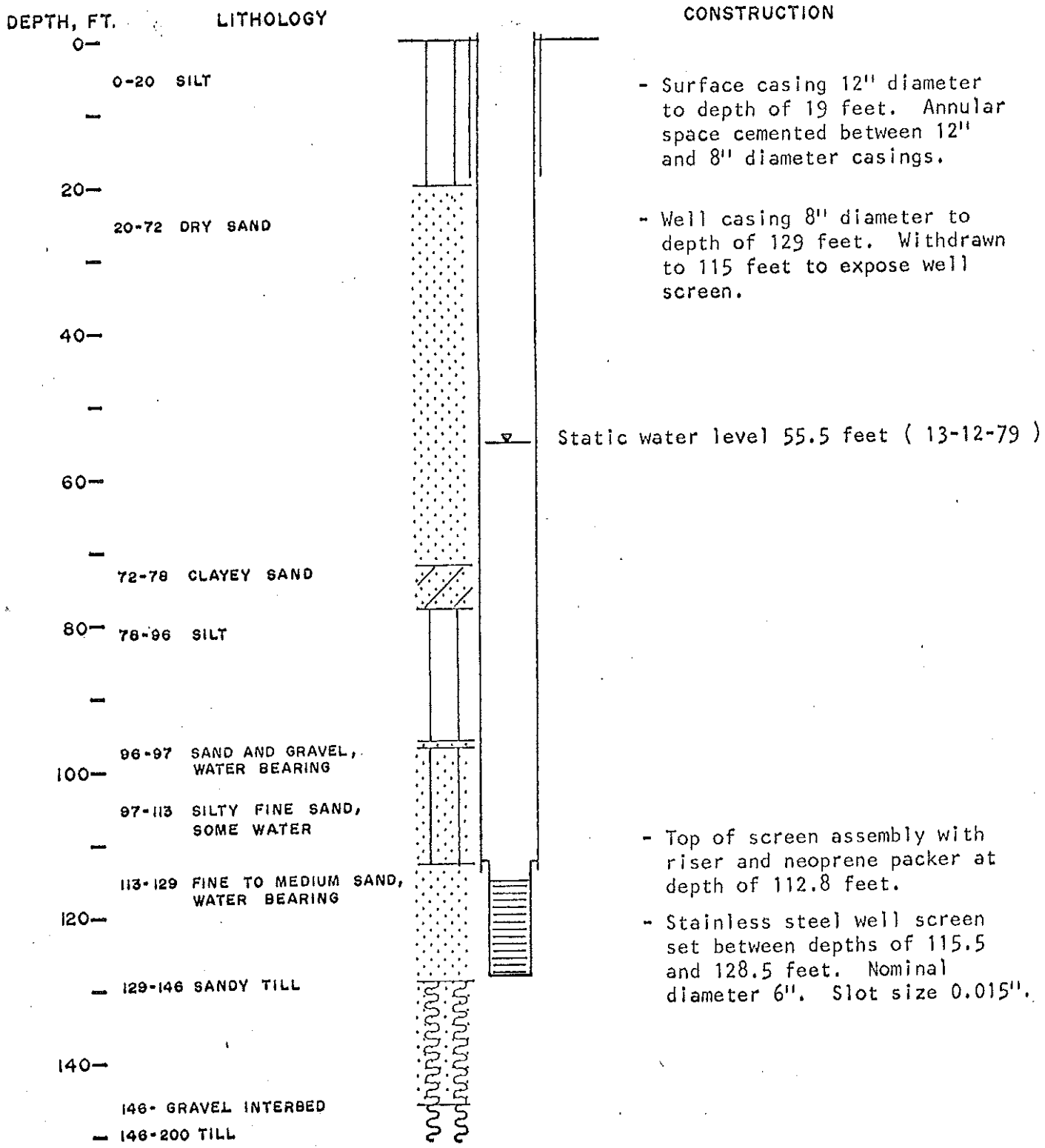
$$16 \text{ feet} \div 37.3 \text{ feet} \times 100 = 43\%$$



CONCLUSIONS AND RECOMMENDATIONS

1. Based upon available information the well is capable of producing 60 USgpm on a sustained basis. (60 USgpm = 50 Igpm = 3.8 lps).
2. The suction of a permanent pump should be set at a depth of 108 feet below ground level.
3. The pump should be capable of delivering 60 USgpm from a pumping level of 92 feet plus the system pressure at ground level.
4. The pump should have a reliable check valve installed to prevent back-flushing of the well screen which might cause the well to pump sand.
5. The well must not be rawhided, over-pumped or vibrated (pump assembly must not be set on well casing).
6. Extreme care should be taken to ensure that no foreign material enters the well. We have known wells to be rendered useless through innocent carelessness as well as deliberate junking.

WTN 109080



STANLEY ASSOCIATES ENGINEERING LTD.
WELL LOG - ENDERBY I.R. NO. 2
BROWN, ERDMAN & ASSOCIATES LTD.
20-11-79 HWR 79-152



BROWN, ERDMAN & ASSOCIATES LTD.

WELL OWNER ENDERBY I. R. 2
 LOCATION ENDERBY B. C.

WELL NO. _____
 JOB NO. 79-152

DRAWDOWN
 RECOVERY

DATE	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER	Q US GPM	REMARKS
13-12-79	12:00	0	55.56	-	- PUMP SUCTION 107', STICKUP 1.1'
		0.5	88.75	52	
		2	88.95		
		2.5	88.90		
		3	88.86		
		3.5	88.78		
		4	88.81		
		4.5	88.95		
	12:05	5	89.06		
		6	88.78		
		7	88.40		
		8	88.07		
		9	87.97		
	12:10	10	87.90		
		12	87.86		
		14	87.85		
		16	87.89		
		18	87.95		
	12:20	20	87.90		
		25	87.95		
	12:30	30	87.97		
	12:40	40	87.91		
	12:50	50	87.94		
	13:00	60	87.85		
	13:20	80	87.86		
	13:40	100	87.94		
	14:30	150	87.90		
	15:20	200	87.93	52	- INCREASED DISCHARGE AT 15:20
	15:25	205	100.52	73	
	15:40	220	100.66		
	16:00	240	100.72		
		260	100.75		



DATE	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER	Q GPM	REMARKS
13-12-79	16:40	280	100.80	73	
	17:00	300	100.80	}	
	17:50	350	100.86		
	18:40	400	100.86		
	19:30	450	100.79		
	21:10	550	100.87		
	22:00	600	100.83		}
	22:50	650	100.86		
14-12-79	00:30	750	100.89	}	
	01:20	800	100.93		
	02:10	850	100.96		
	03:00	900	100.98	}	
	03:50	950	100.95		
	04:40	1000	100.90	73	- GENERATOR HESITATED WHEN FUELED.
	05:30	1050	99.42	69	FLOW DROPPED SLIGHTLY
	06:20	1100	99.49	}	
	08:00	1200	98.65		
	08:50	1250	98.66		
	09:40	1300	98.70		
	10:30	1350	98.71	}	
	11:20	1400	98.69		69
		RECOVERY			
		0.5	61.06	—	
		1	48.95		
		1.5	51.34		
		2	53.19		
		2.5	54.44		
		3	55.10		
		3.5	55.49		
		4	55.82		
		4.5	55.96		
	11:25	5	56.08		
		6	56.16		
		7	56.20		

