WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

STATE OF NEVADA

DIVISION OF WATER RESOURCES

WELL DRILLERS REPORT

Please complete this form in its entirety

OFFICE USE ONLY
Log No. 22431
Permit No. 38655
Basin

Public Works Board

1. OWNER Nevada State Correctional Institute ADDRESS U.S. 95& Cold Creek Rd.

2. LOCATION ¼ ¼ Sec. 33 T. 16S N/S R. 57 E. Clark County
PERMIT NO. 38655 & # 38656

3. TYPE OF WORK	4. PROPOSED USE	5. TYPE WELL
New Well ☒ Recondition ☐	Domestic ☐ Irrigation ☐ Test ☐	Cable ☐ Rotary ☐
Deepen ☐ Other ☐	Municipal ☒ Industrial ☐ Stock ☐	Other ☐ AIR

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Top Soil & Gravel	-----	0	45	45
Clay W/ Gravel Streaks	-----	45	90	45
Gravel (hard) W/ Clay	-----	90	210	120
Hard Shelf	-----	210	215	5
Cemented Gravel	-----	215	1003	788
Water	295			
Water	350			
Water	500			

RECEIVED
DEC 12 1980
Div. of Water Resources
Branch Office — Las Vegas, Nev.

Date started Sept. 9, 1980, 19
Date completed Sept 26, 1980, 19

7. WELL TEST DATA

Pump RPM	G.P.M.	Draw Down	After Hours Pump
SEE ENGINEERS REPORT			

BAILER TEST
G.P.M. Draw down feet hours
G.P.M. Draw down feet hours
G.P.M. Draw down feet hours

8. WELL CONSTRUCTION

Diameter hole ---------- inches Total depth 1003 feet
Casing record
Weight per foot Thickness .250

Diameter		From		To	
Hole Diameter					
14 3/4	inches	0	feet	653	feet
~~9 7/8~~	~~inches~~	~~653~~	~~feet~~	~~1003~~	~~feet~~
9 7/8	inches	653	feet	1003	feet
Casing Diameter					
10 5/8	inches	±2	feet	653	feet
8 5/8	inches	655	feet	1003	feet

Surface seal: Yes ☒ No ☐ Type Cement
Depth of seal fifty feet
Gravel packed: Yes ☒ No ☐
Gravel packed from 653 feet to 50 feet

Perforations:
Type perforation Factory
Size perforation 1/8" x 3" Staggered
From 1003 feet to 300 feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

9. WATER LEVEL

Static water level 239 Feet below land surface 237
Flow G.P.M.
Water temperature °F. Quality

10. DRILLERS CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Charles A. Dimick
Address 4375 N. Tioga
Nevada contractor's license number 016696
Nevada driller's license number 995
Signed Charles A. Dimick
Date October 14, 1980

USE ADDITIONAL SHEETS IF NECESSARY

5471

C. STEVE DEAL, P.E.
REGISTERED CIVIL ENGINEER
5115 SOUTH INDUSTRIAL ROAD #13 · LAS VEGAS, NEVADA 89118

11 October 1980

Valley Drilling
4375 North Tioga
Las Vegas, Nevada 89108

Attention: P. J. Dimick

Subject: WELL CONSTRUCTION, PUMP INSTALLATION AND DRAWDOWN TESTS - Well No. 2 Constructed By Valley Drilling As The Replacement For Well No. 1 - Proposed Southern Desert Correctional Center, Indian Springs, Nevada

Dear Ms. Dimick:

In accordance with your request, I have monitored the construction to deepen Well No. 2, monitored the pump installation, and conducted a series of drawdown tests. Either I or my representative was on the site during the various stages of the well construction, well development, pump installation, and drawdown tests.

Initially, Well No. 2 was advanced to a depth of 660 feet and provided with an 8-inch diameter pump set at a depth of 490 feet. This installation and well performance were described in my report, "Pump Installation and Drawdown Test", dated 22 September 1980.

A meeting regarding construction and performance of both Well No. 1 (by Allen Water Well Service Co.) and Well No. 2 (by Valley Drilling - Water Well Services) was held in the office of John E. Yoxen Co. on Monday, 22 September 1980. Representatives of the State Department of Public Works, the Project Architect and the various involved Contractors were present at the meeting. During the course of the meeting, it was decided to do no further work on Well No. 1 at this time and to deepen Well No. 2 from 660 to 1000 feet. Also, the pump in Well No. 2 would be lowered to a depth of about 600 feet.

Accordingly, Valley Drilling mobilized equipment and began drilling operations on 24 September 1980 to advance Well No. 2 to the 1000 foot depth using air-foam and rotary methods. The Superintendent of Valley Drilling reported that subsequent to achieving a depth of 1000 feet, the well was developed by "blowing" with compressed air for a period of about nine hours. It was noted that the two rigs used at this site produced a combined air volume of 1500 to 1600 CFM at 170 PSIG at the receiver tank. Following development of the well, Water Well Services installed an 8-inch diameter Red Jacket Pump, Model No. 8-550-5A-1B-1C, equipped with a 100 horsepower Franklin motor. The pump was set to a depth of 601 feet using 4-inch diameter Schedule 40 galvanized pipe. A 1/2-inch diameter PVC air line was installed to a depth of 595 feet (about 6 feet above the pump intake) and provided with a pressure gauge and an inlet valve. The pump was installed on 28 September 1980 and a series of three drawdown tests were conducted that afternoon. This test series was conducted by a qualified engineering technician working directly under my technical direction. The drawdown test series included monitoring the water level in Well No. 1 during pumping of Well No. 2 to obtain an estimate of the characteristics of the drawdown curve for Well No. 2. Data obtained in the drawdown test series are presented in the attached Table I. My calculations indicate that the deepened Well No. 2 had a specific capacity of about 0.9 to 1.0 gallons per minute per foot and a yield of about 300 GPM.

The earthwork contractor built a storage lagoon with a PVC liner at the site having an estimated design capacity of about 700,000 gallons. The earthwork contractor reported that about 38 hours of continuous operation of the pump in Well No. 2 was required to fill the lagoon. He noted during this period that the outlet valve required closing at times in order to maintain gauge pressure. This indicates that the yield decreased from about 335 GPM to about 275 GPM during that 38 hour pumping period, for an average yield of about 305 GPM.

Based on my observations, interpretation of the driller's logs and the results of drawdown tests and records of pump operation thus far obtained at the deepened Well No. 2, it appears to me that the specific yield is on the order of about 1.0 gallons per minute per foot of drawdown or slightly less and that the average yield under sustained pumping ranges from about 275 to 300 GPM. As previously reported, the original Well No. 2, (constructed in accordance with the Project Specifications), had a yield of about 272 GPM but was pumped down to the intake level in less than 5 minutes of operation.

In my opinion, the 700 GPM reported to be required for the subject project may be obtained by construction of two additional wells to depths of 1000 feet similar to Well No. 2. It appears that construction of one 1000-foot well in addition to Well No. 2 would achieve a sustained combined yield of about 500 to 600 GPM. My calculations indicate that two additional 1000-foot wells with existing Well No. 2 may have a sustained combined yield on the order of 800 to 900 GPM, provided that the wells are sufficiently separated to prevent overlap of their zones of influence. Note that the preceding estimates are based on the assumption that subsurface and geohydrological conditions at other well locations would be similar to those encountered in Well No. 2 and that the drawdown test and pumping data obtained at Well No. 2 can be extrapolated to other nearby locations.

It is recommended that additional drawdown tests be performed at Well No. 2 and that further pumping operations be monitored by a qualified engineer in order to obtain the necessary data to permit the continued evaluation of the well performance.

Should you have any questions regarding either this report, or the field observations, or the results of the drawdown tests, please contact me at your convenience.

Yours truly,

C. Steve Deal, P.E.
Nevada RCE No. 3088

CSD:kbl

Distribution: (4) Addressee

TABLE I

Drawdown Test Data Summary

Well No. 2 (1000-Foot Total Depth)

Red Jacket Model No. 8-550-5A-1B-1C with 100 HP Franklin motor set at 601 foot depth.

1/2-inch PVC air line set at 595 foot depth with gauge reading to a maximum of 110 PSI.

Well No. 2 about 12 hours following development and static water level measured at 239 feet.

Test No. 1 - 28 September 1980

Time (Hrs)	Air Line Gauge Reading (PSI)	Flow Rate (GPM)	Remarks
1357	110	540	Start pump
1407	-	460	4" dia. pipe
1411	20	460	
1412	15	460	
1413	13	460	
1414	9	460	
1415	4	460	Stop pump

Average flow rate = 500 GPM

No drawdown in Well No. 1

Calculated yield = 321 GPM (Recovery time was 10 minutes)

Calculated specific capacity = 0.9*

*Gallons per minute per foot of drawdown

TABLE I (Continued)

Drawdown Test No. 2 - 28 September 1980

Time (Hrs)	Air Line Gauge Reading (PSI)	Flow Rate (GPM)	Remarks
1425	110	500	Start pump
1430	70	500	
1431	61	500	
1432	53	500	
1433	47	500	
1434	38	500	
1435	31	500	
1436	26	500	
1437	20	500	
1438	15	500	
1439	11	500	
1440	5	500	
1441	1	500	Stop pump

Average flow rate = 500 GPM

No drawdown in Well No. 1

Calculated yield = 308 GPM (Recovery time was 9 minutes)

Drawdown = 353 Feet

Calculated specific capacity = 0.9*

*Gallons per minute per foot of drawdown

T A B L E I (Continued)

300 GPM measured through a 2-inch diameter valve and 15 feet of 2-inch diameter hose to a 50 gallon barrel.

Drawdown Test No. 3 - 28 September 1980

Time (Hrs)	Air Line Gauge Reading (PSI)	Flow Rate (GPM)	Water Depth In Well No. 1	Remarks
1500	110*	300	236.0	Start pump
1510	110*	300		
1515	110*	300		
1530	110*	300		
1545	110*	300		
1600	110*	300	238.0	
1615	110*	300		
1630	105	300	238.5	
1645	104	300		Increase flow rate
1700	110	350	238.5	
1715	104	350		
1730	100	350		
1745	100	350		Increase flow rate
1800	83	425	238.75	
1815	80	425		
1830	78	425	238.80	
1845	75	425		Depletion rate 23.1 Ft/Hr
1900	73	425		Stop pump

Test interval:	(1)	(2)	(3)
Calculated yield:	300 GPM	350 GPM	425 GPM
Drawdown:	13.8 Ft	23.1 Ft	23.1 Ft
Depth of water remaining over pump:	384.2 Ft	338.9 Ft	291.6 Ft
Calculated specific capacity:	0.9 **	1.0 **	Not determined

* Upper limit of air line gauge

** Gallons per minute per foot of drawdown

C. STEVE DEAL, P.E.
REGISTERED CIVIL ENGINEER
5115 SOUTH INDUSTRIAL ROAD #13 · LAS VEGAS, NEVADA 89118

22 September 1980

Water Well Services
5115 South Industrial Road
Las Vegas, Nevada 89118

Attention: Mr. Merle B. Steele

Subject: PUMP INSTALLATION AND DRAWDOWN TEST -
Well No. 2 Constructed By Valley Drilling
To Serve As The Replacement For Well No. 1,
Proposed Southern Desert Correctional Center,
Indian Springs, Nevada

Dear Sir:

In accordance with your request, I have monitored the installation of the pump, the well pumping development, and a drawdown test for the subject Well No. 2. The subject well was drilled using air rotary methods to a reported depth of 660 feet. It is also reported that the specified 10-inch diameter casing, which was provided with factory perforations in the lower section, was set to a depth of about 650 feet.

On 21 September 1980, I observed the installation of an 8-inch diameter Red Jacket Pump, Model No. 8-550-5A-1B-1C, equipped with a 100 horsepower Franklin motor. The pump was set to a total depth of 490 feet using 4-inch diameter Schedule 40 galvanized pipe. A 1/2-inch inside diameter PVC air line was installed to the top of the pump and provided with a pressure gauge and an inlet valve.

Attempts were made to develop the well slowly by closing the discharge valve, but it was noted that after pumping about 20 minutes, the water was drawn down to near the top of the pump intake.