MUMULT 1 RECEIVED
AUG 111983

ATER	RESOURCES	State Permit No.	••••
4 4 2	*****	diam's it is	

SALEM, OREGON

1) OWNER:	(10) LOCATION OF WELL:			
Name City of Portland-Bureau of Water WK\$	County Multnomah Driller's well number 8307			
Address 1,1,20 S.W. 5th Ave.	NE 4 SW 4 Section 24 T. 1.N R. 3E W.M.			
Dity Portland State OR 97201.	Tax Lot # Lot Blk Subdivision  Truck North of PR on North			
2) TYPE OF WORK (check):	Address at well location: Just North of RR on North side of Sandy off East side of 1.48th			
New Well	(11) WATER LEVEL: Completed well.			
f abandonment, describe material and procedure in Item 12.	20			
(3) TYPE OF WELL: (4) PROPOSED USE (check):	Depth at which water was instituted			
Rev Rotary Air M Driven , Domestic Industrial Municipal	Static level 7.9 ft. below land surface. Date 7.2 Artesian pressure lbs. per square inch. Date			
Rotary Mud Dug				
Bored □ Thermal: Withdrawal □ Reinjection □	(12) WELL LOG: Depth drilled  Diameter of well below casing			
(5) CASING INSTALLED: Steel X Plastic Threaded Welded X	Formation: Describe color, texture, grain size and structure of materials; and show			
	thickness and nature of each stratum and aquifer penetrated, with at least one entry			
"Diam from ATTACHED SHEET Gauge "Diam from It to Gauge	for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.			
	MATERIAL From To SWL			
LINER INSTALLED:				
"Diam from	SEE ATTACHED SHEET			
(6) PERFORATIONS: Perforated? □ Yes No				
Type of perforator used				
Size of perforations in. by in.				
perforations fromft. toft.				
perforations from ft. to ft.				
perforations from				
(7) SCREENS: Well screen installed? ☐ Yes 4 No UOP Johnson				
Manufacturers Name Type Stainless Steel Model No.				
Diem 12" PS Slot Size . 033et from 41.9.4 ft. to 420.4ft.				
Diam. 1.2" PS Slot Size .033et from 439.6 ft. to 549.6 ft.				
(8) WELL TESTS: Drawdown is amount water level is lowered below static level	1.00			
Amm				
The a pump test made: El 1cs El 1;0 L 1;0 El				
2500 gal/min with 127 ft. drawdown after 24 hrs.				
Air test — gal/min. with drill stem at — ft. — hrs.				
Air test gal/min. with drill stem at ft. nrs.  Bailer test gal/min. with ft. drawdown after hrs.				
Artesian flow g.p.m.				
Perature of water Depth artesian flow encountered ft.	Work started 4/4 19 83 Completed 7/29 1983			
(9) CONSTRUCTION: Special standards: Yes X No □	Date well drilling machine moved off of well 7/29 1983			
Well seal—Material used	Drilling Machine Operator's Cartification:			
Well sealed from land surface toft.	This well was constructed under my direct supervision. Materials used			
SEE ATTACHET	and information reported above are true to my best/knowledge and belief.			
Diameter of well bore to bottom of seal	[Signed] Warning Machine Operator) Survey State 8/4, 19.83			
Number of sacks of cement used in well seal	Drilling Machine Operator's License No. 1,1,21,			
How was cement grout placed? Pumped through grout				
pipe from bottomof seal zone upward.	Water Well Contractor's Certification:  This well was drilled under my jurisdiction and this report is true to			
Was pump installed?	the best of my knowledge and belief.			
Was a drive shoe used? ▼Yes □ No Plugs Size: location	Name SCHNEIDER EQUIPMENT, INC.  (Type or print)			
Did any strata contain unusable water?  Yes  No	Address 24881 River Rd. N.E., St. Paul, OR 971.37			
Type of Water? depth of strata				
Method of sealing strata off	[Signed] Mater Well Contractor's License No 644 Date			
Was well gravel packed? XYes No BEE ATTACHED SHEET				
Gravel placed from				

WATER RESOURCES DEPT.

SALEM, OFFICH
City of Portland-Bureau of Water Works

CORRECTED COPY

No. 8307

/ u.b		
(12) WELL LOG:	From	To
<u>Material</u>	0	<del></del> 3
Clay, brown, silty	3	<b>3</b> 8
Boulders, and clay, brown, silty	<b>3</b> 8	12
Cobbles, gravel & clay, brown	Ŭ	1.~
Cobbles & gravel, loose, w/ occasional	1.2	71.
boulders & sand	4, ~	,
Gravel & cobbles, cemented w/ occasional	71.	87
boulders & sand	87	92
Gravel & cobbles, cemented Gravel, cobbles & boulders, cemented	O /	7~
	92	1.03
w/ sandstone, dark green	1.03	1,24
Gravel & cobbles, cemented	1.24	1,44
Boulders & gravel, cemented	1.44	1.56
Gravel & cobbles, cemented w/ some sand	1.56	1,61,
Cobbles & gravel, loose	1,61,	1.63
Gravel & sand, cemented	1,63	1.64
Gravel & cobbles, loose	1.64	1.67
Cobbles, boulders, gravel, cemented	1.67	1.69
Clay, grey, gritty	1.69	1.75
Sandstone, black, fine, hard	1.75	1.82
Sandstone, black, medium, medium hard	1.82	1.99
Clay, grey-green	1.99	207
Sand, fine w/ some grey clay	207	21.6
Clay, grey	21.6	221,
Clay, grey w/ dark green sand strata	221	223
Sand, green, medium, some cementation	223	227
Clay, grey, silty	227	231
Clay, green w/ some claystone	231.	233
Clay, green w/ some sandstone & sand	233	236
Sand, grey, medium fine	236	237
Clay, greenish-grey	237	240
Sand, grey, medium fine w/ grey clay	240	246
Clay, blue-grey	246	255
Clay, blue-grey, sticky	255	260
Clay, blue-grey w/ some claystone	260	266
Clay, multi-colored	266	268
Claystone, black	268	271
Sandstone, black, fine Sandstone, black, fine w/ cobbles & gravel	271.	273
Sandstone, black, fine w/ occasional grey clay		282
Clay, brown	282	285
Claystone, grey & sandstone & clay	285	287
Clay, blue-grey	287	290
Clay, grey w/ sandstone lenses	290	292
Clay, grey turning to claystone	292	295
Sandstone, black-green, w/ clay, grey-green	295	304
Sandstone, medium, black	304	323
Sandstone, fine, black	323	327
Sandstone, medium coarse, black	327	335
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City of Portland-Bureau of Water Works

No. 8307

(12) WELL LOG: (Cont'd) Material	From	To
Sandstone, medium coarse, black w/ some gravel	<del>335</del>	<del>34</del> 0
Gravel & sand, fine, green, cemented	340	356
Sand, grey, fine, loose	356	<b>3</b> 58
Gravel & sand, fine, green, cemented	358	367
Sand, greenish grey, medium fine, loose	367	370
Gravel & sand, fine, green, cemented	370	376
Gravel, cemented w/claystone	376	378
Gravel & sand, medium coarse, some cemented	378	401
· · · · · · · · · · · · · · · · · · ·	401	412
Clay, grey	412	423
Clay, brown & grey	423	429
Siltstone, blue-green	429	432
Clay, grey	432	
Sand, grey, medium fine	434	448
Sand, grey, fine-cemented	448	
Sand, black, coarse, slightly cemented	460	
Gravel & sand, green, cemented	<del>4</del> 86	
Sand, black, medium	495	
Gravel & sand, fine, grey	504	
Gravel & sand, green, cemented	507	556
Gravel & sand, medium fine, grey		
Clay, greenish-grey	556	560

13E-240a

### City of Portland-Bureau of Water Works

CASING INSTALLED:

22" Diam. from +1.0 ft. to 229.0 ft. Gauge .375
18" Diam. from 10.0 ft. to 430.0 ft. Gauge .375
12" Diam. from 409.6 ft. to 419.4 ft. Gauge .375, S.S.,
from 420.4 ft. to 439.6 ft. Gauge .375, S.S., from 549.6 ft. to 559.6 ft. Gauge .188, S.S. ""一直,

The top of the upper 12" S.S. pipe includes two neoprene packers and the bottom of the lower 12" S.S. pipe is equipped with a plate and bail. There is a special slip packer assembly located on top of the screen assembly to seal between the screen assembly and the 1,8" casing.

An 8" valve assembly was installed at 5 ft. below ground off the 22" casing. 

### (9) CONSTRUCTION:

cell was drilled 26" dlameter from 0' to 34'
drilled 22" dlameter from 34' to 71'
underreamed to 26" dlameter from 71' to 130' drilled 22" diameter from 130' to 165' underreamed to 26" diameter from 165' to 176' underreamed to 26" diameter from 165' to 176'
drilled 22" diameter from 176' to 209'
underreamed to 26" diameter from 209' to 230'
drilled 21" diameter from 230' to 244'
drilled 18" diameter from 244' to 301'
underreamed to 22" diameter from 301' to 430'
drilled 17" diameter from 430' to 511'
drilled 16" diameter from 511' to 560'
Pea gravel was placed from 0 ft, to 7 ft, between the 22" casing and the pore hole,
and the pore hole,
casing and the eroded bore hole (the upper bore hole was eroded out to a minimum 3" clearance around the 22" casing) from 7 ft.
to 19 ft.
841 sacks of Type III cement grout were placed from 19 ft, to 34 ft.
between the 22" casing and the bore hole,
100 sacks of Type III cement grout were placed in the 26" diameter underreamed hole and the 22" casing then driven through the grout to seal the 22" casing to the bore hole from 209 ft, to 229 ft.

to seal the 22" casing to the bore hole from 209 ft. to 229 ft. 80 sacks of Type III cement grout were placed in the 22" diameter underreamed hole and the 18" casing then drived through the grout to seal the 18" casing to the bore hole from 410 ft. to 430 ft.

3 sacks of Type III cement grout were placed from 10 ft. to 12 ft.

between the 18" and 22" casings on top of an "0" ring assembly. #1,2-20 sand pack was placed between the 12" screen/S.S. pipe section and the 1,6" bore hole/1.8" casing from 41.4 ft. to 560 ft.



## Water Resources Department

MILL CREEK OFFICE PARK

555 13th STREET N.E., SALEM, OREGON 97310

ATER RESOURCES DEPT. SALEM, OREGON

Milo Schneider Schneider Equipment, Inc. 21881 River Road N.E. St. Paul, Oregon 97137

Dear Mr. Schneider:

Please accept my apologies for the delay in responding to your recent eletter requesting special standards for the use of concrete instead of cement grout as a sealing material in large diameter wells that provide excessive space between the drill hole wall and the outside casing of the well. You are hereby granted special permission to use concrete instead of neat cement with the following provisions

- and conditions:

  1) Concrete shall consist of clean, hard, endurable aggregate,
  and not less than five sacks of Portland cement per cubic yard
  of concrete. Maximum diameter of the aggregate shall not exceed
  3/4 of an inch in diameter.

  2) If the well bore hole to be sealed is not dry, concrete shall be pumped from the bottom of the seal zone upward in one continuous
- operation to land surface.
- In the event that the well bore annular space to be sealed is dry, concrete shall be placed through a tremie pipe to prevent segregation of the aggregate and cement mixture and to prevent bridging
- The space between the sealing surfaces of all casings and between all casings and the bore hole shall exceed 3-inches or more.

Special standards to construct a well as described above shall be considered to apply to all wells constructed in such a manner. Please refer to these special standards on the well reports of all well constructed

WBM:c1h

cc: Clifton R. King, Watermaster, District #16



# Water Resources Department

MILL CREEK OFFICE PARK

555 13th STREET N.E., SALEM, OREGON 97310

PHONE 378-2907

or

1-800-452-7813 (message line)

June 10, 1982

RECEIVED

AUG 111993 WATER RESOURCES DEPT. SALEM. OREGON N/3E-24ca

William Hoffstetter Bureau of Water Works 1800 Southwest 6th Portland, OR 97392

Dear Bill:

I apologize for the delay in responding to your request for special standards dated April 14, 1982, and updated May 7, 1982.

As you know, special standards must be issued to the drilling contractor. However, I will give tentative approval to the design outlined so that bids may be obtained. It will then be necessary for the contractor to request the identical special standards specifying the locations of the well(s) where these techniques are to be used.

To reiterate: 1) a 20-foot seal will be approved in the confining stratum overlying each confined water bearing zone; and 2) the neoprene/concrete seal between the inner and outer casings as shown in the drawing included with your May 7, 1982 request will be approved.

If I can be of further assistance, please call. I'll try to be more prompt!

Sincerely,

FREDERICK G. LISSNER

min with a former

Hydrogeologist

FGL:wpc



# PORTLAND, OREGON

BUREAU OF WATER WORKS

Francis J. Ivancie. Mayor Carl Goebel, Administrator 1800 S.W. 6th Portland, Oregon 97201 (503) 248-4178

April 14, 1982

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AUG 111983

State of Oregon
Department of Water Resources
555 13th Street N.E.
Salem, OR 97310

WATER RESOURCES DEPT. SALEM, OREGON

Attention:

Mr. William McCall

Subject:

Request for SPECIAL STANDARDS for the EAST WELL FIELD PRODUCTION WELLS -- PHASE IV of the City of Portland

### Gentlemen:

Enclosed herewith are specifications titled "East Well Field Production Wells - Phase IV" and Plan No. 1-G-154 which are proposed to serve as the contract documents for the three production wells of the City of Portland's Groundwater Development Program. The manner in which these wells are proposed to be constructed is believed to not conform with all the provisions of the "General Standards for the Construction and Maintenance of Water Wells in Oregon" and Special Standards are requested for those items which are not in conformance with the General Standards.

The Special Standards requested are the same as were granted by the State for Phase I and II of this development by letters dated March 20, 1979 and August 6, 1980.

The proposed production wells, specifically Types I and II on Sheet 2 of Plan 1-G-154, are required by the attached specifications to have a minimum grout seal above a confined aquifer of 20 feet instead of the 30 feet required in the General Standards. This has been done because of the following circumstances:

- 1. The confining layers above both confined aquifers are not cemented formations, but are instead compacted silts and fine sands which are subject to erosion.
- The confined adulfers have sufficient head to flow when unrestrained, and the lower aquifer is capable of flows in excess of 500 gpm at the ground surface.
- 3. The head difference between the two confined aquifers is sufficient to generate considerable flow between the two aquifers if a path for such a flow is created.

12/3E-24 ca Mult.

4. The confining layers have been found by previous investigations by the City to vary considerably in thickness and they may not be 30 feet thick at all locations.

Given the above characteristics, it is believed that if the contractor were to drill into one of the confined aquifers while drilling the hole for the subsurface seal, sufficient flow would be created outside the well casing to severely erode the confining layer and inhibit the placement of cement grout as a seal. Placement of only 20 feet of grout seal against the confining layer will significantly reduce the likelihood that the lower aquifer will be encountered prior to placement of the grout seal and a Special Standard is requested which will permit the use of 20-foot sub-surface seal.

The requirement for a 30-foot sub-surface grout seal above the confined aquifers could be met by extending the seal into the overlying aquifer. However, the overlying aquifers are not sufficiently consolidated or cemented to stand open hole if drilled by cable tool or air rotary drills. Additionally, these aquifers are sufficiently permeable that grout would flow out into the aquifer and it is unlikely that any such seal will be successful.

The Water Bureau requests a second Special Standard which will permit use of a mechanical-type watertight seal to be placed between the 22-inch outer casings and the 18-inch inner casings of Type I wells. This type of seal is proposed for use because placement of a cement grout seal between two casings so close in size would be very difficult. Additionally, if the grout seal were to leak, it would be extremely difficult, if not impossible, to repair. However, if the mechanical seal were to leak, it could be removed, repaired, and reinstalled.

The seal between the 18 and 22-inch casings could be made by extending the inner casing to the ground surface and welding a plate between the casings. However, the inner casing has been terminated below ground in order to increase the area available in the top of the well for special piping and other specialized equipment required to monitor and safeguard the well.

If there are any questions concerning this communication or other Special Standards required for the proposed wells, please notify Bill Hoffstetter at the above address, or by phone at 254-3678, and the Bureau will furnish whatever additional information or requests are required.

Sincerely,

C. Goebel, Administrator

William F. Hoffstetter Engineer III

WFH: 1s Enclosures

cc: P. Norseth

Ralph H. Jackson, Water Resources Dept. Al Smyth, Health Divn., Human Resources Dept.



## PORTLAND, OREGON

BUREAU OF WATER WORKS

Frencia J. Ivancia, Mayor Carl Goebel, Administrator 1800 S.W. 6th Portland, Oregon 97201 (503) 248-4178

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AUG 111983 WATER RESOURCES DEPT. SALEM, OREGON

1M3E-2400

May 7, 1982

Mr. Fred Lissner Oregon Water Resources Dept. 555 13th Street N.E. Salem, Oregon 97310

Dear Mr. Lissner:

Enclosed is a drawing of a typical water tight seal used between the 18" and 22" casings on Type 1, Phase II production wells. We anticipate the use of a similar seal on the Type 1, Phase IV production wells.

Sincerely, Carl Goebel, Administrator

Bill Hoffstetter Engineer III

BH:rjm

Enclosure

cc: P. Norseth

B. Willis

14" STEEL STOP RING . 14" STEEL STOP RING 12 NEOPRENE RUBBER 14/3E-24ca AUG 111983 WATER RESOURCES DI SALEM, OREGON RECEIVE NHONS D RING SCF. HOHIN 4 .0 14 STEEL BAND SEAL CASINGS ON WELLS WELL CASING TIGHT SED BETWEEN BE ON PHASE IL PRO

USED

COMMISSIONERS

M. K. MCIVER, CHAIRMAN
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GLENN L. JACKSON, MEMBER
MEDFORD

FLOYD QUERY, SECRETARY SALEM



# STATE OF OREGON STATE HIGHWAY DEPARTMENT

SALEM

June 2, 1961

Water Well Report Lewis and Clark State Park Multnomah County

1N/3-25 H

Multhough

W. C. WILLIAMS STATE HIGHWAY ENGINEER

FORREST COOPER
DEPUTY STATE HWY, ENGR.

LEONARD I. LINDAS CHIEF COUNSEL

REGEIVED

STATE E.!GINEER SALEM, OREGON

Dear Mr. Stanley:

Mr. Lewis A. Stanley 170 12th Street, S.E.

Salem, Oregon

Attached is a "Water Well Report" reporting a well drilled in Lewis and Clark State Park, located near Troutdale in Multnomah County.

Very truly yours,

L. V. Koons

Deputy State Parks Superintendent

attach.

June 16, 1961

L. V. Koons Deputy State Parks Superintendent State Highway Department Salem, Oregon

Dear Mr. Koons:

This will acknowledge receipt of the water well report for the well drilled in Lewis and Clark State Park, located near Troutdale in Fultnoman County.

Very truly yours,

LEWIS A. STANLEY State\_Engineer

Jack E. Soeva Geologist

JES: mb