

Attachment A

Well Logs for Existing Authorized & Proposed Points of Appropriation

RECEIVED

OCT 01 2010

WATER RESOURCES DEPT
SALEM, OREGON

T 11138

RECEIVED

DESC 5655
655

185/12E-20ac

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

APR 30 1986

WATER RESOURCES DEPT PLEASE TYPE OR PRINT IN INK

(for official use only)

(1) OWNER:
Name Mt High Water System Jan Ward
Address 61045 Brosterhouse Rd
City Bend State Ore

(2) TYPE OF WORK (check):
New Well Deepening Reconditioning Abandon
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL: (4) PROPOSED USE (check):
Rotary Air Driven Domestic Industrial Municipal
Rotary Mud Dug Irrigation Thermal Withdrawal ReInjection
Cable Bored Other: Community
Piezometric Grounding Test

(5) CASING INSTALLED: Steel Plastic
Threaded Welded
....." Diam. from + 3 ft. to 488 ft. Gauge 250

LINER INSTALLED: Steel Plastic
Threaded Welded
....." Diam. from ft. to ft. Gauge

(6) PERFORATIONS: Perforated? Yes No
Size of perforations 1/8 in. by 3 in.
1170 perforations from 425 ft. to 485 ft.

(7) SCREENS: Well screen installed? Yes No
Manufacturer's Name
Type Model No.
Diam. Slot Size Set from ft. to ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom?
Well: gal./min. with ft. drawdown after hrs.
Air test 90 gal./min. with drill stem at 489 ft. 1 hrs.
Bailer test no gal./min. with return ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 52 Depth artesian flow encountered ft.

(9) CONSTRUCTION: Special standards: Yes No
Well seal—Material used cement
Well sealed from land surface to 30 ft.
Diameter of well bore to bottom of seal 15 in.
Diameter of well bore below seal 12" 30 to in 485-8" 485 to 488
Amount of sealing material 84 cement sacks pounds
How was cement grout placed? pumped from 30 to 0

Was pump installed? no Type HP Depth ft.
Was a drive shoe used? Yes No Plug Size: location ft.
Did any strata contain unusable water? Yes No
Type of Water? depth of strata
Method of sealing strata off
Was well gravel packed? Yes No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL by legal description:
County Des SW 4 NE 4 of Section 20 of
Township 18 S Range 12 E WM.
(Township is North or South) (Range is East or West)
Tax Lot Lot Block Subdivision
MAILING ADDRESS OF WELL (or nearest address) Mt High Dev
Bend, Ore

(11) WATER LEVEL of COMPLETED WELL:
Depth at which water was first found 415 ft.
Static level 410 ft. below land surface. Date 4/4/86
Artesian pressure lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 0
Depth drilled 488 ft. Depth of completed well 88 ft.
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 for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
brn sand	0	2	
brn congl med	2	5	
tan congl crse	5	25	
gray basalt	25	38	
brn basalt	38	91	
brn congl	91	103	
gray basalt	103	151	
brn ss	151	173	
gray basalt	173	222	
brn congl crse	222	264	
dk gray basalt	264	279	
brn sand med bldra	279	304	
dk gray basalt	304	325	
tan congl fine	325	336	
brn ss	336	357	
brn congl	357	403	
tan claystone	403	415	410
redish gray congl (WB)	415	439	
gray basalt brn ves basalt (WB)	439	458	
tan congl (fine gravel) (WB)	458	464	
gray basalt (WB)	464	488	
Date work started <u>2/28/86</u> /completed <u>4/4/86</u>			
Date well drilling machine moved off of well <u>4/4</u> 19 <u>86</u>			

(unbonded) Water Well Constructor Certification (if applicable):
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Michael D. Williams Date 4/7, 19 86

(bonded) Water Well Constructor Certification:
Bond 468400 Issued by: U. S. F. & G.
(number) (Surety Company Name)
On behalf of John V. Johnson
(type or print name of Water Well Constructor)

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief:
(Signed) John V. Johnson
Water Well Constructor
4/7/86

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NOTICE TO WATER WELL CONSTRUCTOR
The original and first copy of this report are to be filed with the

OCT 01 2010

WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

SP*46868-690

WATER RESOURCES DEPT
SALEM, OREGON

T 11138

RECEIVED DESC 57054

18/10E-20ad

STATE OF OREGON
WATER WELL REPORT
 (as required by ORS 537.766)

JUN 30 1987

(1) OWNER: *OWNERS*
 Name Mt High Water Systems WATER RESOURCES DEPT
 Address 61045 Brosterhouse Rd. SALEM, OREGON
 City Bend State Ore Zip 97701

(2) TYPE OF WORK:
 New Well Deepen Recondition Abandon

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable Other

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Other

(5) BORE HOLE CONSTRUCTION:
 Depth of Completed Well 502 ft.
 Special Standards date of approval _____

HOLE		SEAL		Amount	
Diameter	From To	Material	From To	sacks or pounds	
15"	0 30	cem	0 30	75 sacks	
12"	30 502				

How was seal placed? Method A B C D E
 Other _____

Backfill placed from _____ ft. to _____ ft. Material _____
 Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing: 10"	+2	502	.250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner:				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:

Perforations Method machine
 Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
442	502	1/8 by				<input type="checkbox"/>	<input type="checkbox"/>
		3	1140			<input checked="" type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour
 Pump Bailer Air Flowing
 Artesian

Yield gal/min	Pumping level	Drill stem at	Time
<u>10 lb. test pumped at later date</u>			1/4 hr
			1 hr

Temperature of water 53 Depth Artesian Flow Found _____
 Was a water analysis done? Yes By whom _____
 Did any strata contain water not suitable for intended use? Yes No
 Salty Muddy Odor Colored Other _____
 Depth of strata: _____

(9) LOCATION OF WELL by legal description:
 County Des Latitude _____ Longitude _____
 Township 18 S N or S, Range 12 E E or W, WM.
 Section 20 SE 1/4 NE 1/4
 Tax Lot _____ Lot _____ Block _____ Subdivision _____
 Street Address of Well (or nearest address) _____

(10) STATIC WATER LEVEL:
412 ft. below land surface. Date 6/9/87
 Artesian pressure _____ lb. per square inch. Date _____

(11) WELL LOG: Ground elevation _____

Material	From	To	WB?	SWL
brn soil	0	2		
crs congl brn	2	21		
gray basalt	21	40		
brn vesicular basalt	40	45		
brn basalt	45	94		
brnsh gray cinders	94	102		
gray basalt	102	130		
brkn rubble zone	139	132		
brn congl med	132	145		
brn congl fine	145	159		
gray vesicular basalt	159	168		
brn ss congl crse	168	199		
gray basalt	199	215		
redish gray cinders	215	218		
gray basalt-intermitt	218	282		
(ent fractures)				
brn congl crse	282	302		
gray basalt	302	318		
brn ss congl	318	324		
gray basalt	324	335		
brn ss	335	354		
brn congl w/tan clay	354	403		
(strips)				
red cindery rubble	403	419	WB	412
dk gray basalt	419	430		
redish gray cinders	430	438	WB	
gray basalt	438	460		
red cinders	460	465	WB	
brkn gray basalt	465	483	WB	
redish gray cindery	483	496	WB	
(cong)	483	496	WB	
med gravel	496	502	WB	

Date started 5/29/87 Completed 6/9/87

(unbonded) Water Well Constructor Certification:
 I constructed this well in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.
 Signed [Signature] Date 6/16/87

(bonded) Water Well Constructor Certification:
 I accept responsibility for construction of this well and its compliance with all Oregon water well standards. This report is true to the best of my knowledge and belief.
 Signed [Signature] Date 6/16/87
 Company Johnson Well Drilling Co. Job No. _____

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STATE ENGINEER TO WATER WELL CONTRACTOR
The original and first copy
of this report are to be
filed with the

STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date
of well completion.

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WATER WELL REPORT
STATE OF OREGON
WATER RESOURCES DEPT.
SALEM, OREGON

OCT-01-2010
195/12E-16bc
203 8611336

(1) OWNER:
Name J.L. Ward Construction Co.
Address 61045 Brosterhouse Rd.
Bend 97702

(2) TYPE OF WORK (check):
New Well Deepening Reconditioning Abandon
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL: Rotary Cable Dug
Driven Jetted Bored
(4) PROPOSED USE (check): Domestic Industrial Municipal
Irrigation Test Well Other

CASING INSTALLED: Threaded Welded
12" Diam. from +2 ft. to -410 ft. Gage 250
" Diam. from _____ ft. to _____ ft. Gage _____
" Diam. from _____ ft. to _____ ft. Gage _____

PERFORATIONS: Perforated? Yes No.
Type of perforator used Torch
Size of perforations 1/4 in. by 6 in.
500 perforations from 330 ft. to 410 ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

(7) SCREENS: Well screen installed? Yes No
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? Ward
Yield: 1500 gal./min. with _____ ft. drawdown after _____ hrs.
See Attached Letter " " " " " "
" " " " " "
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow None g.p.m.
Temperature of water 52 Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:
Well seal—Material used Portland Cement Grout
Well sealed from land surface to 50 ft.
Diameter of well bore to bottom of seal 18 in.
Diameter of well bore below seal 16-18 in.
Number of sacks of cement used in well seal _____ sacks
Number of sacks of bentonite used in well seal None sacks
Brand name of bentonite NA
Number of pounds of bentonite per 100 gallons of water _____ lbs./100 gals.
Was a drive shoe used? Yes No Plugs _____ Size: location _____ ft.
Did any strata contain unusable water? Yes No
Type of water? _____ depth of strata _____
Method of sealing strata off _____
Was well gravel packed? Yes No Size of gravel: 1/4-1/2
Gravel placed from 50 ft. to 410 ft.

(10) LOCATION OF WELL:
County Deschutes Driller's well number _____
SW 1/4 NW 1/4 Section 16 T. 18S R. 12E W.M.
Bearing and distance from section or subdivision corner
2,000' South of NW Corner of Sec. 16

(11) WATER LEVEL: Completed well.
Depth at which water was first found 335 ft.
Static level 335 ft. below land surface. Date _____
Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG: Diameter of well below casing 16"
Depth drilled 417 ft. Depth of completed well 410 ft.
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 for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Sandy Soil	0	4	
Gray Lave	4	28	
Lava Chunks	28	34	
Red Cinders	34	49	
Lava Chunks	49	56	
Conglomerate tan	56	89	
Gray Pumice	89	112	
Black Lava	112	137	
Lava Chunks	137	162	
Red Cinders	162	166	
Black Cinders	166	172	
Lava Black	172	191	
Conglomerate	191	221	
Lava Gray	221	253	
Red Cinders	253	271	
Lava Chunks	271	306	
Gray Basalt	306	319	
Gray Lava	319	336	335

(Continued Below)

Work started 4/18 19/4 Completed 6/26 19 74
Date well drilling machine moved off of well 6/28 19 74

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] _____ Date _____, 19____
(Drilling Machine Operator)
Drilling Machine Operator's License No. _____

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Jan L. Ward
(Person, firm or corporation) (Type or print)
Address 61045 Brosterhouse Road, Bend, Oregon
[Signed] _____
(Water Well Contractor)
Contractor's License No. _____ Date _____, 19____

The original and true copy of this report are to be filed with the

ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER W DESC 5613

STATE OF (Please type)

(Do not write ab

OWNER:

Name J.L. Ward Construction Co. Address 61045 Brosterhaus Rd.

(2) TYPE OF WORK (check):

New Well [] Deepening [] Reconditioning [] Abandon [] If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary [] Driven [] Cable [] Jetted [] Dug [] Bored []

(4) PROPOSED USE (check):

Domestic [] Industrial [] Municipal [] Irrigation [] Test Well [] Other []

(5) CASING INSTALLED:

Threaded [] Welded [] 12" Diam. from -42 ft to -410 ft Gage 350

(6) PERFORATIONS:

Perforated? [] Yes [] No. Type of perforator used Torch Size of perforations 1/4 in. by 6 in. 500 perforations from 330 ft to 410 ft

(7) SCREENS:

Well screen installed? [] Yes [X] No Manufacturer's Name Model No. Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level Was a pump test made? [X] Yes [] No If yes, by whom? Ward Yield: See Attached Letter

(9) CONSTRUCTION:

Well seal—Material used Portland Cement Grout Well sealed from land surface to 50 ft Diameter of well bore to bottom of seal 18 in. Diameter of well bore below seal 16-18 in.

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Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated...

Table with columns: MATERIAL, From, To, SWL. Rows include Red Cinders, Cemented Gravel, Gray Layer, etc.

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DEC 14 2000

WATER RESOURCES DEPT SALEM, OREGON

Work started 4/18 1974 Completed 6/28 1974 Date well drilling machine moved off of well 6/28 1974

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] Date, 19 (Drilling Machine Operator)

Drilling Machine Operator's License No.

Water Well Contractor's Certification:

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

Name Jan J. Ward (Person, firm or corporation) (Type or print)

Address 61045 Brosterhaus Road, Bend, Oregon

[Signed] (Water Well Contractor)

Contractor's License No. Date, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP-4566-118

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"communities planned with pride"

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JUL 17 1978
WATER RESOURCES DEPT.
SALEM, OREGON

July 13, 1978

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OCT 01 2010
WATER RESOURCES DEPT
SALEM, OREGON

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

Gentlemen:

Enclosed please find a completed well log for a well that was drilled in May and June of 1974.

The drilling was done with tools and machines belonging to Ward Construction Company and operated by Lawrence Kowaleski of Madras, Oregon .

The drilling was completed in late June 1974; the casing was installed and the seal was installed and the well completed on September 24, 1974.

An 8" Lineshaft Turbine Pump was installed in the summer of 1977 and the well as tested for a period of 30 days at a flow of 1500 Gallons Per Minute. There was no apparent draw down in the two adjacent wells before, during or after the test period.

The tardiness of this well log was due to my misunderstanding of who was to make the filing.

If there is any additional information required, please advise.

Ward Construction Company

A handwritten signature in cursive script, appearing to read 'Jan L. Ward', is written over the typed name.

Jan L. Ward
President

JW/mc

Enclosures

has folder 8611336

STATE OF OREGON WATER SUPPLY WELL REPORT (as required by ORS 537.765 & OAR 690-205-0210)

OCT 01 2010 WELL LABEL # L 100376 START CARD # 1003631 WATER RESOURCES DEPT SALEM, OREGON

(1) LAND OWNER Owner Well I.D. Pilot Butte Well #4 First Name Last Name Company CITY OF BEND Address P.O. BOX 431 City BEND, State OR Zip 97701

(2) TYPE OF WORK [X] New Well [] Deepening [] Conversion [] Alteration (repair/recondition) [] Abandonment

(3) DRILL METHOD [] Rotary Air [] Rotary Mud [X] Cable [] Auger [] Cable Mud [] Reverse Rotary [] Other

(4) PROPOSED USE [] Domestic [] Irrigation [X] Community [] Industrial/ Commercial [] Livestock [] Dewatering [] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION Special Standard [] (Attach copy) Depth of Completed Well 1,160 ft.

Table with columns: Dia, From, To, Material, From, To, Amt, Sacks/lbs. Rows for Cement seal at 26, 22, and 15 feet.

How was seal placed: Method [] A [] B [X] C [] D [] E [] Other

Backfill placed from 335 ft. to 660 ft. Material Bentonite Chips Filter pack from ft. to ft. Material Size

Explosives used: [X] Yes Type Deta Gel Amount 9 sticks 2x16

(6) CASING/LINER Table with columns: Casing, Liner, Dia, From, To, Gauge, Sll, Plstc, Wld, Thrd. Includes diagrams of casing and liner profiles.

Shoe [] Inside [X] Outside [] Other Location of shoe(s) 850 Temp casing [] Yes Dia From To

(7) PERFORATIONS/SCREENS Perforations Method Factory Saw Screens Type Material

Table with columns: Perf, Casing/Screen, Liner, Dia, From, To, Scrn/slot width, Slot length, # of slots, Tel/pipe size. Lists perforation details for different casing and liner sections.

(8) WELL TESTS: Minimum testing time is 1 hour [X] Pump [] Bailer [] Air [] Flowing Artesian

Table with columns: Yield gal/min, Drawdown, Drill stem/Pump depth, Duration (hr). Shows test results for 1,150 and 950 gal/min yields.

Temperature 51 °F Lab analysis [] Yes By Water quality concerns? [] Yes (describe below) From To Description Amount Units

(9) LOCATION OF WELL (legal description) County DESCHUTES Twp 17 S N/S Range 12 E E/W WM Sec 33 NE 1/4 of the NE 1/4 Tax Lot 101

1402 N.E. LAFAYETTE

(10) STATIC WATER LEVEL Date SWL(psi) + SWL(ft) Existing Well / Prodeepening Completed Well 06-24-2009 702

WATER BEARING ZONES Depth water was first found 684 Table with columns: SWL Date, From, To, Est Flow, SWL(psi), + SWL(ft). Rows for dates 11-28-2008, 03-14-2009, 06-04-2009, 06-24-2009.

(11) WELL LOG Ground Elevation 3,712 Material From To See Attached Formation Log 0 1,160

Date Started 06-06-2008 Completed 06-24-2009

(unbonded) Water Well Constructor Certification I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards.

(bonded) Water Well Constructor Certification I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above.

WESTERN WATER DEVELOPMENT RECEIVED P.O. Box 1670 REDMOND, OR 97756 JUL 02 2009 WATER RESOURCES DEPT SALEM, OREGON

T 11138

DESC 58778

WESTERN WATER DEVELOPMENT
 P.O. Box 1670
 Redmond, OR 97756

Well: Pilot Butte Well #4
 Customer: City of Bend, Oregon
 Formation Geology Description

Material	From	To
Sandy Loam with Boulders	0	8
Broken Dark Gray Basalt	8	26
Black Vesicular Basalt	26	43
Broken Dark Gray Basalt	43	52
Black Vesicular Basalt	52	60
Dark Gray Basalt	60	74
Black / Red Basalt	74	95
Black / Red Basalt with Cinders	95	102
Black / Red Basalt	102	116
Vesicular Basalt with Cinders	116	130
Gray Basalt	130	144
Black / Red Basalt	144	152
Red Cinders	152	163
Hard Gray Basalt	163	170
Black / Red Basalt	170	181
Hard Gray Basalt	181	196
Red Cinders	196	202
Very Hard Gray Basalt	202	222
Red Cinders	222	228
Reddish Pumice & Gravels	228	250
Brown Pumice & Gravels	250	276
Brown Pumice & Sand	276	302
Broken Dark Gray Basalt	302	355
Hard Gray Basalt	355	367
Black Red Basalt	367	377
Brown Sandstone	377	388
Broken Black / Red Basalt	388	395
Void-Cement Grout	395	405
Hard Gray Basalt Slanted	405	414
Used Explosives to Straighten Borehole		
Black with Red / Brown Basalt	414	423
Brown Sandstone	423	437
Black Sandstone with Pumice	437	451
Hard Gray Basalt	451	463
Black & Red Basalt with Cinder Beds	463	474
Broken Gray Basalt	474	492
Broken Black Basalt	492	504
Broken Black & Red Basalt & Cinders	504	524
Hard Dark Gray Basalt	524	534
Very Hard Gray Basalt	534	541
Caving, cemented back to 500 ft. 10/31		
Caving, cemented back to 495' on 11/3		

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 SALEM, OREGON

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Material	From	To	
Brown Sandstone	541	549	
Dark Gray Basalt	549	578	
Black & Red Broken Basalt	578	598	
Broken Black Basalt	598	623	
Brown Sandstone with Gravel	623	655	
Dark Gray Basalt	655	664	
Black & Red Basalt	664	694	SWL 682'
Vasicular with Ash Imbediments			
Broken Gray Basalt	694	705	
Broken Black & Red Basalt	705	715	
Redish Sandstone w/ Black & Red Gravels	715	743	
Broken Black Basalt	743	755	SWL 685'
Hard Gray Basalt	755	766	
Broken Black & Red Basalt w/ Red Cinders	766	780	
Broken Vesicular Black, Red & Brown Basalt	780	790	
Gray Basalt	790	813	
Red Conglomerate	813	834	SWL 686.5'
Brown Sandstone	834	864	
Black Basalt with Red Cinders	864	872	
Brown Conglomerate	872	925	
Black Basalt	925	958	
(No Returns from 958'-970')			
Black Basalt with Red Cinder fragments and seams of Brown Ash	958	1035	687.5
No Returns	1035	1050	
Black Basalt	1050	1080	
No Returns	1080	1095	
Black Basalt with Cinder Imbedaments	1095	1160	

Well Seal & Backfill Information

Surface Grout Seal	40 yds cement grout	0	101
Bentonite Backfill	20 Super Sacks	101	307
Intermediate Seal	2 yds cement grout	307	335
Bentonite Backfill	33 Super Sacks	335	660
Bottom Grout Seal	2 yds cement grout	660	680

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SALEM, OREGON

WESTERN WATER DEVELOPMENT
P.O. Box 1670
Redmond, OR 97756

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WATER RESOURCES DEPT
SALEM, OREGON

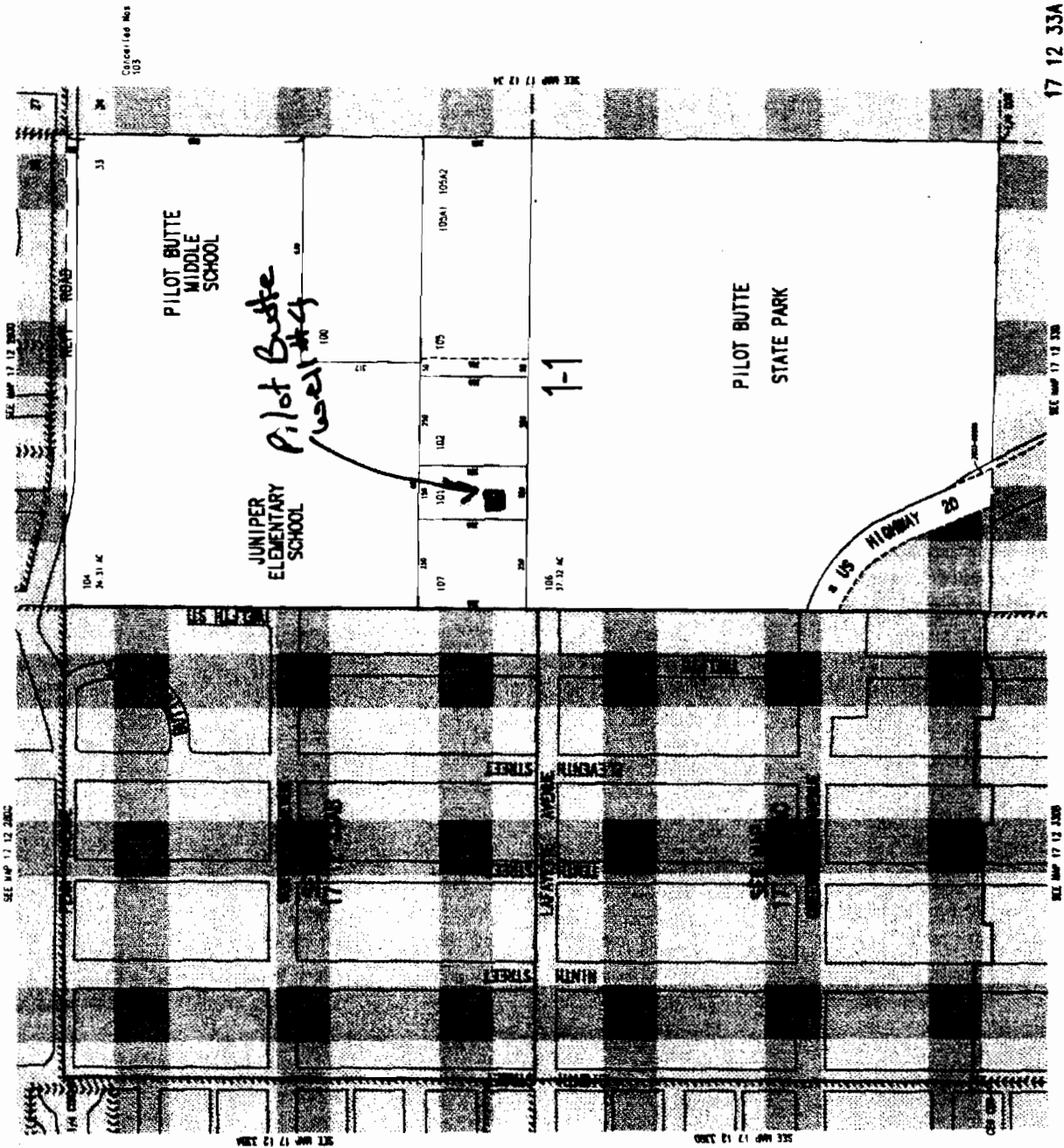
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DESC 58778

17 12 33A
& INDEX

17 12 33A
& INDEX

DESC 58778
NE 1/4 SEC. 33 T. 17S. R. 12E. W.M.
DESCHUTES COUNTY
1" = 200'



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SALEM, OREGON

WESTERN WATER DEVELOPMENT
P.O. Box 1670
Redmond, OR 97756

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WATER RESOURCES DEPT
SALEM, OREGON

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THIS MAP WAS PREPARED BY
ASSESSOR OF DESCHUTES COUNTY, OREGON
REVISED: 03/27/2005

DESC
52907

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STATE OF OREGON
WATER SUPPLY WELL REPORT WATER RESOURCES DEPT.
(As required by ORS 537.765) SALEM, OREGON

WELL I.D. # L 39583
START CARD # 124991

Instructions for completing this report are on the last page of this form.

(1) OWNER: Well Number PB3
Name City of Bend
Address PO Box 431
City Bend State OR Zip 97709

(2) TYPE OF WORK
 New Well Deepening Alteration (repair/recondition) Abandonment

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable Auger
 Other

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes No Depth of Completed Well 1140 ft.
Explosives used Yes No Type _____ Amount _____

HOLE			SEAL			
Diameter	From	To	Material	From	To	Sacks or pounds
20"	0	862	cement	0	150	134 bags
			cement	822	862	66 bags

How was seal placed: Method A B C D E
 Other

Backfill placed from 822 ft. to 150 ft. Material cent/sand grout
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing: 14"	0	862	375	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner:				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:

Perforations Method Factory
 Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
860	1140	1/8x3	13440	10"		<input type="checkbox"/>	<input checked="" type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

<input checked="" type="checkbox"/> Pump	<input type="checkbox"/> Bailer	<input type="checkbox"/> Air	<input type="checkbox"/> Flowing
Yield gal/min	Drawdown	Drill stem at	Artesian Time
1,000	30		24 hrs.

Temperature of water 53 Depth Artesian Flow Found _____
Was a water analysis done? Yes By whom _____
Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
Depth of strata: _____

(9) LOCATION OF WELL by legal description:
County Deschutes Latitude _____ Longitude _____
Township 18 N of 3 Range 12 E or W. WM.
Section 33 NE 1/4 NE 1/4
Tax Lot 101 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) 1402 NE Lafayette
Bend, Oregon 97701

(10) STATIC WATER LEVEL:
786 ft. below land surface. Date 2-15-00
Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
Depth at which water was first found 815

From	To	Estimated Flow Rate	SWL
752	815	NA	752 ft. 4"
871	1140	1,000+	786

(12) WELL LOG:
Ground Elevation _____

Material	From	To	SWL
SEE ATTACHED SHEET			
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Date started December 6, 1999 Completed March 24, 2000

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number 1672

Signed [Signature] Date _____

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 14164

Signed [Signature] Date _____

T 11138

START CARD #: 124991

**FORMATION LOG FOR THE CITY OF BEND, PILOT BUTTE WELL #3
BY GEO-TECH EXPLORATIONS, INC.**

From/To	Material
0-6	Sand & Cobbles
6-352	Cinders, red, soft
352-370	Basalt, gray, hard
370-390	Lava & Pumice, soft, red
390-470	Lava, gray, porous
470-560	Basalt, fractured, gray
560-580	Basalt, broken
580-650	Basalt, fractured, gray
650-693	Basalt, gray, hard
693-700	Lava, red, medium
700-705	Basalt, weathered, soft
705-717	Basalt, gray, medium
717-725	Basalt, gray-red, porous
725-815	Basalt, gray, fractured, medium
815-854	Basalt, gray, broken
854-871	Basalt, fractured, hard
871-884	Lava, red & brown, loose
884-900	Lava, red & black, some cinders, red-pumice, soft
900-915	Lava, gray-black, soft
915-927	Basalt, gray, medium
927-940	Lava, gray-red, porous
940-973	Cemented pea gravels, weathered
973-987	Lava, gray, medium
987-1,040	Lava conglomerate
1,040-1,115	Lava, black & brown, soft
1,115-1,121	Basalt, gray, hard, pin holes
1,121-1,131	Lava, gray-brown, soft
1,131-1,141	Basalt, gray, hard

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WATER SUPPLY WELL REPORT

DESC 52907 *Amendment*

Received Date 04/10/2000

(as required by ORS 537.765)

Well ID Tag # L 39583

Instructions for completing this report are on the last page of this form.

Start Card # 124991

(1) OWNER

Well Number

Name
CITY OF BEND
Street PO BOX 431
City BEND State OR Zip 97709

(9) LOCATION OF HOLE By legal description

County Deechutes Latitude Longitude
Township 17.00 S Range 12.00 E Subdivision
Tax lot 101 Lot Block
Section 33 NE 1/4 NE 1/4

(2) TYPE OF WORK

- New Alter (Recondition) Alter (Repair)
 Deepening Abandonment

Street Address of Well (or nearest address)

1402 NE LAFAYETTE

MAP with location indantified must be attached

(3) DRILL METHOD

- Rotary Air Rotary Mud Cable Auger

Other

(10) STATIC WATER LEVEL

786.0 Ft. below land surface. Date 02/15/2000
Artesian Pressure lb/sq. in. Date

(4) PROPOSED USE

- Domestic Community Industrial Irrigation Injection
 Livestock Thermal Other

(11) WATER BEARING ZONES

Depth at which water was first found 815 ft.

(5) BORE HOLE CONSTRUCTION

Special Standards Depth of completed well 1140 ft.
Explosives Used Amount Type

(12) WELL LOG

Ground Elevation ft.

How seal placed: Method Other
Backfill placed from ft. TO ft. Material
Filter pack from ft. TO ft. Size in.

(6) CASING/LINER

Casing or Liner	Diameter	Begin Depth	End Depth	Gauge	Material	Weld	Threaded	Construction	Location Of Shoe
<input type="checkbox"/> C	14.00	0.00	862.00	.375	S	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

(7) PERFORATION/SCREENS

- Perforation: Method
 Screens Type Material

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(8) WELL TESTS (Minimum testing time is 1 hour)

Type	Yield	Units	Drawdown	Stem at	Duration
Pump	1000.0	G	30.0		24.0

Date started 12/06/1999 Completed 03/24/2000

(unbonded) Water Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed By
(bonded) Water Well Constructor Certification: WWC Number

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work was done in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1484
Signed By GREG MCINNIS GEO-TECH EXPLORATIONS

Temperature of water 53 °F/C Depth artesian flow found ft.
Was water analysis done?

By Whom?

- Did any strata contain water not suitable for intended use? Too Little Salty
 Muddy Odor Colored Other

Depth of strata ft.

T 11138

STATE OF OREGON
 WATER SUPPLY WELL REPORT
 (as required by ORS 537.765)

(WELL ID) # L 72483
 (START CARD) # 168799

Instructions for completing this report are on the last page of this form.

(1) OWNER: Well Number **Outback #7**
 Name **USFS Deschutes National Forest (Lessee: City of Bend)**
 Address **1001 Emkay (Lessee: PO Box 431)**
 City **Bend** State **OR** Zip **97702**

(2) TYPE OF WORK
 New Well Deepening Alteration (repair/recondition) Abandonment

(3) DRILL METHOD:
 Rotary Air Rotary Mud Cable Auger
 Other **Reverse Circulation Rotary**

(4) PROPOSED USE:
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other

(5) BORE HOLE CONSTRUCTION:
 Special Construction approval Yes No Depth of Completed Well **860.5** ft.
 Explosives used Yes No Type _____ Amount _____

HOLE			SEAL			
Diameter	From	To	Material	From	To	Sacks or pounds
23	0	14	cement	0	160	128 sacks
20 nom	14	612	Intermediate	Sealing	Material:	
15	612	860.5	Bentonite	160	575	28,200 pounds
			Cement	575	612	110 sacks

How was seal placed: Method A B C D E
 Other **Bentonite was poured & probed**

Backfill placed from _____ ft. to _____ ft. Material _____
 Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Material			
					Steel	Plastic	Welded	Threaded
Casing:	16	+2	612	.375	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liner:	12	602.5	860.5	.375	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:
 Perforations Method **factory mill cut**
 Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
610.5	860.5	3/16x3	11424			<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>

(8) WELL TESTS: Minimum testing time is 1 hour

Yield gal/min	Drawdown	Drill stem at	Flowing	
			Pump	Artesian
1470	0.8		<input checked="" type="checkbox"/>	<input type="checkbox"/>
1470	0.8		<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>

Temperature of water **-52F** Depth Artesian Flow Found _____
 Was a water analysis done? Yes By whom _____
 Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
 Depth of strata: _____

(9) LOCATION OF WELL by legal description:
 County **Deschutes** Latitude _____ Longitude _____
 Township **18** S Range **11** E WM.
 Section **3** NE 1/4 of NW 1/4
 Tax Lot **200** Lot _____ Block _____ Subdivision _____
 Street Address of Well (or nearest address) **18900 Skyliners Rd**
Bend, OR 97709

(10) STATIC WATER LEVEL:
469.5 ft. below land surface. Date **10/17/06**
 Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
 Depth at which water was first found **trace 456+; significant @ 612'**

From	To	Estimated Flow Rate	SWL
612	860	see (8)	see (10)
456+	528-	trace	456

(12) WELL LOG:
 Ground Elevation _____

Material	From	To	SWL
see attached formation log			

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Date started **3/15/06** Completed **10/20/06**

(unbonded) Water Well Constructor Certification:
 I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
 WWC Number _____
 Signed _____ Date _____

(bonded) Water Well Constructor Certification:
 I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
 WWC Number **649**
 Signed *Stephen Schneider* Date **11/3/06**

T 11138

DESC 57760

USFS Deschutes National Forest / City of Bend Outback Well #7

by Schneider Drilling Co.

Start Card #168799 Label #L72483

<u>FM</u>	<u>TO</u>	<u>DESCRIPTION</u>
0	2	Top soil and basalt, broken
2	10	Basalt, grey, medium
10	16	Basalt, grey, medium, fractured
16	47	Basalt, grey, medium w/seams of red
47	66	Cinders, red w/seams of basalt, grey, medium
66	106	Pumice, white
106	157	Cinders, red w/seams of basalt, grey, medium & pumice, white
157	166	Pumice, tan
166	373	Pumice, tan & basalt, grey, medium & cinders, red
373	385	Basalt, grey, hard
385	397	Pumice, tan & basalt, grey, medium
397	400	Basalt, grey, hard, fractured
400	410	Cinders, red, soft
410	426	Basalt, grey hard
426	460	Basalt, grey, medium-hard interbedded with basalt, black, broken & cinders, black & red
460	475	Cinders, red w/black & pumice, tan; soft
475	508	Pumice, tan & cinders, red w/black; very soft
508	528	Cinders, red w/black, soft
528	548	Cinders, red & black, w/pumice, tan & some basalt chips, black
548	555	Cinders, red & black w/some pumice, tan
555	608	Pumice, tan w/cinders, red & black
608	610	Pumice, tan w/cinders, red-brown
610	639	Basalt, grey, hard, some fractures
639	647	Basalt, grey, hard-medium, wome fractures, w/some basalt, brown, fracture, occ vesicles
647	656	Basalt, grey, hard, some fractures
656	673	Basalt, grey red & brown, medium-soft, broken, some vesicles, some cinders
673	687	Cinders, red & brown, soft, broken, some vesicles
687	704	Basalt, grey hard
704	712	Basalt, red & grey, medium-hard
712	717	Cinders, red, soft
717	726	Basalt, dark red w/some grey, medium-hard
726	732	Basalt, grey, medium-hard
732	740	Basalt, dark red & grey, medium-hard, vesicular
740	743	Basalt, grey w/some red, medium-hard
743	745	Basalt, grey, hard
745	767	Basalt, grey red & brown, medium-soft, broken, some vesicles, some cinders
767	774	Basalt, dark red, medium, broken, w/some cinders, red
774	781	Basalt, red, soft, cindery w/some grey basalt
781	782	Basalt, grey red brown, medium-hard, w/some red cinders
782	832	Basalt, grey w/some red, hard, fractured
832	852	Basalt, red w/some brown, medium, fractured w/cinders & some pumice
852	860.5	Basalt, grey w/some red, hard, fractured & some cinders

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