

WASC

51537

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

WELL I.D. # L 66328

START CARD # : 1000054

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

(1) LAND OWNER Well Number 3  
Name City Of Mosler  
Address PO Box 456  
City Mosler State Oregon Zip 97040

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

(3) DRILL METHOD  
 Rotary Air  Rotary Mud  Cable  Auger  Cable Mud  
 Other \_\_\_\_\_

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

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

BORE HOLE			SEAL			Sacks or Pounds
Diameter	From	To	Material	From	To	

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 \_\_\_\_\_

Casing:	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
					<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"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Drive Shoe used  Inside  Outside  None  
Final location of shoe(s) \_\_\_\_\_

(7) PERFORATIONS/SCREENS  
 Perforations Method \_\_\_\_\_  
 Screens Type \_\_\_\_\_ Material \_\_\_\_\_

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
						<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  
 Pump  Bailer  Air  Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time

Temperature of water \_\_\_\_\_ 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 (legal description)  
County Wasco  
Tax Lot \_\_\_\_\_ Lot \_\_\_\_\_  
Township 2 N Range 11 E WM  
Section 12 SW 1/4 NE 1/4  
Lat \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " or \_\_\_\_\_ (degrees or decimal)  
Long \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " or \_\_\_\_\_ (degrees or decimal)  
Street Address of Well (or nearest address) \_\_\_\_\_  
1024 Mosler Creek Rd, Mosler, OR 97040

(10) STATIC WATER LEVEL  
\_\_\_\_\_ ft. below land surface. Date \_\_\_\_\_  
\_\_\_\_\_ ft. below land surface. Date \_\_\_\_\_  
Artesian pressure \_\_\_\_\_ lb. per square inch Date \_\_\_\_\_

(11) WATER BEARING ZONES  
Depth at which water was first found \_\_\_\_\_

From	To	Estimated Flow Rate	SWL

(12) WELL LOG Ground Elevation \_\_\_\_\_

Material	From	To	SWL
Please see attached report			

Date Started 3-5-2006 Completed 4-3-2006

(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. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number \_\_\_\_\_ Date \_\_\_\_\_  
Signed \_\_\_\_\_

(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. 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 1293 Date 04/10/07  
Signed Jim Hansen

**PERSON PUMP & WELL DRILLING, INC.**

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166 Rimrock Road  
Goldendale, WA 98620  
Phone: 509-773-4085  
Fax: 509-773-3322

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APR 16 2007

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April 4, 2007

Ref: City of Mosier Well #3 repair report.

This is a letter report concerning the recent repair of the City of Mosier's Well #3. In 1989, the Oregon Water Resource Department (OWRD) ordered the City of Mosier to abandon or repair Well #3 in order to stop the commingling of the Priest Rapids and the Pomona aquifers. Instead of abandoning the well, the City was allowed to install a packer in the well to stop the commingling. In March 2000, an inspection of the well revealed that the packer was no longer preventing the commingling. In April 2000, Mark Yinger submitted a plan to permanently repair the well. The recent repair work followed the well repair plan as proposed in April 2000. The contractor for the well repair project was Person Pump and Drilling out of Goldendale, Washington. Brian Mayer with the OWRD, Mark Yinger, Hydrogeologist and John Grim, Engineer observed the well repair process.

**Progress Narrative**

On March 5<sup>th</sup> and 6<sup>th</sup>, 2007 the pump was removed from the well followed by the removal of the 6-inch pipe and attached packer. On the following day a video inspection of the 8-inch well casing and open-borehole below it was made. Between March 8<sup>th</sup> and 14<sup>th</sup> the U. S. Geological Survey logged the well using a variety of methods.

On March 15<sup>th</sup> a new inflatable packer on a 4-inch diameter pipe column was installed and the packer inflated to 400 pounds per square inch (psi) using nitrogen. A valve on the 4-inch pipe was closed shutting off artesian flow from the Priest Rapids aquifer beneath the packer. It was observed that when the valve was closed the water level between the 4-inch pipe and 8-inch casing rose in response to the increased head in the Priest Rapids aquifer. This indicated that there was flow around the packer through fractures in the basalt. On March 27<sup>th</sup> a submersible pump was installed in the 4-inch pipe column and the water level inside the 4-inch pipe was lowered to the level of the water between the 4-inch

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pipe and 8-inch casing. This was done to equalize the pressure head of the Priest Rapids aquifer with that of the Pomona aquifer in the vicinity of the well in order to eliminate the potential for flow between the aquifers.

The pump was operated continuously between March 27<sup>th</sup> and April 1<sup>st</sup> and the two water levels were monitored and kept equal. The discharge was very slightly increased several times during this pumping period as the water levels slowly declined and then stabilized. On March 29<sup>th</sup> the cement grout was placed with a tremie pipe and grout pump into the space between the 4-inch pipe column and the 8-inch casing from the top of the packer up approximately 38 feet into the 8-inch casing.

On April 1<sup>st</sup> the submersible pump in the 4-inch pipe column was turned off and the pump was removed. The top of the tee on the 4-inch pipe column was then plugged and the discharge valve closed to shut-in the Priest Rapids aquifer. After shut-in no change was observed in the water level between the 4-inch pipe column and the 8-inch casing. Next the 4-inch pipe column was removed by screwing off at a left-hand threaded coupling located approximately 3 feet above the top of the cured grout. The coupler came out with the pipe column leaving left-hand male threads on the top of the 4-inch pipe protruding above the cured grout. A video inspection of the grout was made by the driller.

On April 3<sup>rd</sup> the original submersible pump was placed back in the well. The top of the pump is set at 220 feet below the top of the 10-inch tee. The pump is 8 feet long. A brief one hour long pump test was then conducted. The drawdown after one hour was 218 feet measured from the top of the 10-inch tee at a pumping rate of 237 gpm.

### Technical Data

1. Top of packer is set at 280.9 feet below the top of the 10-inch tee at the wellhead. Note; measurements were made from the top of the 10-inch tee on the wellhead.

2. The packer bladder is 5 feet long and the total packer length is 6 feet.

3. Shut-in pressures:

15 to 16 psi : Prior to repair -commingling

21.6 psi : Inside 4-inch pipe column after the packer was inflated

22 psi : After grout cured -commingling stopped

4. Equalized water levels in 4-inch pipe column and between the 4-inch pipe and the 8-inch casing were maintained at 29.6 feet below the top of the 10-inch tee before grouting and until the grout was cured.

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5. Top of cement grout is 241.7 feet below the top of the 10-inch tee. The top of the 4-inch pipe is at 238.7 feet.

6. Five batches of cement grout were pumped with a grout pump and tremie pipe set at the top of the packer. Each batch was 4.65 cubic feet for a total of 23.25 cubic feet of cement grout. Each batch of cement grout consisted of: 23.4 gallons of water, three bags of cement (94 pound bags), 11.25 pounds of bentonite (4% bentonite), and 28 ounces of Delvo to retard setting. Approximately 13.35 cubic feet of cement grout was pumped outside the of 8-inch casing and approximately 9 cubic feet of the cement grout fills the space between the 4-inch pipe and 8inch casing from 241.7 feet to the top of the packer at 280.9 feet.

7. Attached is an as-built drawing for Well #3.

### Discussion of Results

It was clear that after the packer was inflated there was still some flow between the two aquifers in the vicinity of the well. It was critical that there be as little potential as possible for flow and that is why the water level inside 4-inch pipe column was pumped down to match the water level between the 4-inch pipe and 8-inch casing.

The weight of the water column above the grout forced the grout to flow out the openings at the bottom of the 8-inch casing and up the 10-inch boring to fill and seal the space between the outside of the 8-inch casing the blue claystone aquitard. This effectively completed a seal between the Priest Rapids and Pomona aquifers thus preventing commingling.

During the grouting operation the water level inside the 4-inch pipe column gradually rose 0.8 feet. This is evidence that as the grout was forced outside the 8-inch casing and into the formation some additional flow from the Priest Rapids aquifer to the Pomona aquifer was stopped.

### Conclusions

Based on the evidence presented above it is reasonable to conclude that the repair was successful in permanently putting an end to commingling at the City Mosier's Well #3.

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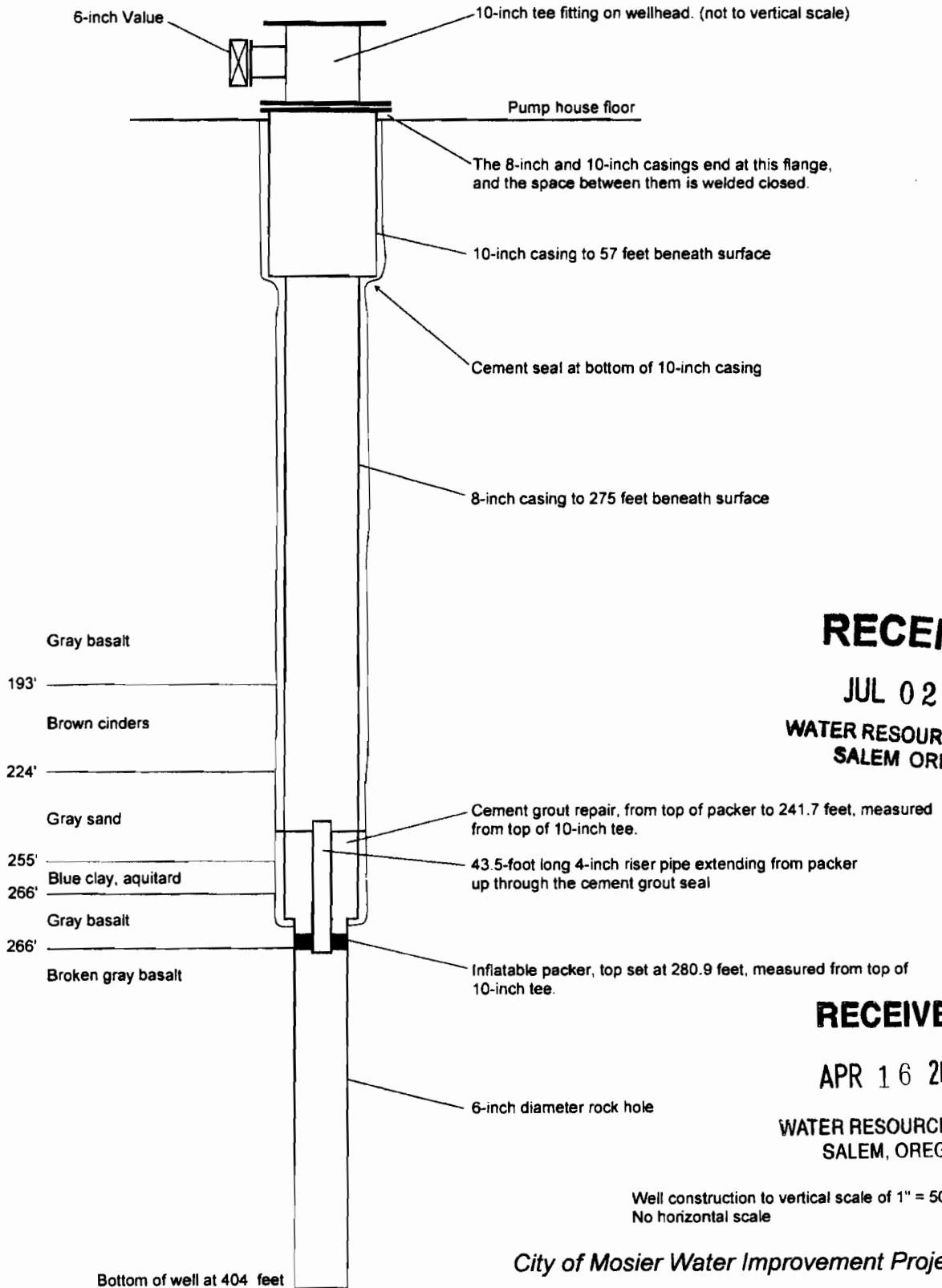
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Well construction to vertical scale of 1" = 50'.  
 No horizontal scale

*City of Mosier Water Improvement Project*

PERSON PUMP & WELL DRILLING, INC.

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166 Rimrock Road  
Goldendale, WA 98620  
Phone: 509-773-4085  
Fax: 509-773-3322

Mosier Well #3 Pump Test

This test used the existing Grundfos 6" submersible pump. The pump is installed to 221' to the top of the pump, making the pump intake at approximately 226'.

Tuesday 4-2-2007

Test started at 9:00a.m. The pump started with the throttling valve closed; shut in psi 22; valve was opened and pumping rate climbed to 325 g.p.m. and water level declined so fast that I was unable to "catch up with it". I then valved the pump down, creating approximately 9-10 psi head on the pump and stabilized the water level at 219' 5". I then took a reading on the totalizing meter at 9:10am at 9,628 and again at 10:10am, 23,828. When ending the test, in 5 minutes and 8 seconds, the well was flowing. The shut in pressure was 17psi and climbing.

End meter reading: 23,828  
Begin meter reading: 9,628  
Gallons pumped 1 hour : 14,200  
GPM Pumping rate: 236.6



Dwayne Person  
Person Pump & Well Drilling

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