

MEMO

State of Idaho

Department of Water Resources

322 E Front Street, P.O. Box 83720, Boise, Idaho 83720-0098

Phone: (208) 287-4800 Fax: (208) 287-6700

Date: October 23, 2013

To: Jeff Peppersack

From: Dennis Owsley

cc: Sean Vincent

Subject: Water level trend analysis in the vicinity of a proposed Point of Diversion (POD) in North Ada County.

Introduction

A request to the hydrology section was submitted to provide an update of the conditions and/or trends in the water levels in the North Ada County area, north of the cities of Star and Eagle, Idaho. A water right application and transfer application have been submitted to the department in which a well greater than 200 feet deep will be drilled and pumped from 04N 01W Section 3. This memo summarizes the water level monitoring efforts in the vicinity of the proposed POD.

Monitoring Wells

As part of the North Ada County Hydrogeologic Investigation, the Department has been monitoring nine wells within 2.5 miles of the proposed POD (Figure 1). In addition, a local consulting firm has been monitoring two wells within the same 2.5-mile radius. Monitoring wells, domestic wells, and irrigation wells are all used for monitoring. For domestic and irrigation wells in which a pump is installed, care was taken while collecting the hand measurements to ensure the well was not pumping or had recently been pumped. A summary of the data available from the wells used in this analysis is presented in Table 1.

Data Analysis

Data used for this analysis includes quarterly hand measurements as well as data collected from data loggers. The analysis of the data consisted of applying a linear regression trend line to all of the available measurements. If a water level was collected while a well was pumping, or if the well was recovering, these measurements were omitted from the trend analysis.

As shown in Figure 1 and Table 1, two of the 11 wells monitored in the vicinity of the proposed POD showed a rising water level trend, a shallow (103 feet deep) domestic well and a shallow (144 feet deep) monitoring well. One well experienced no discernible trend, and the remainder experienced water level declines. The rates of decline are slight, ranging from 0.1 to 0.8 feet per year.

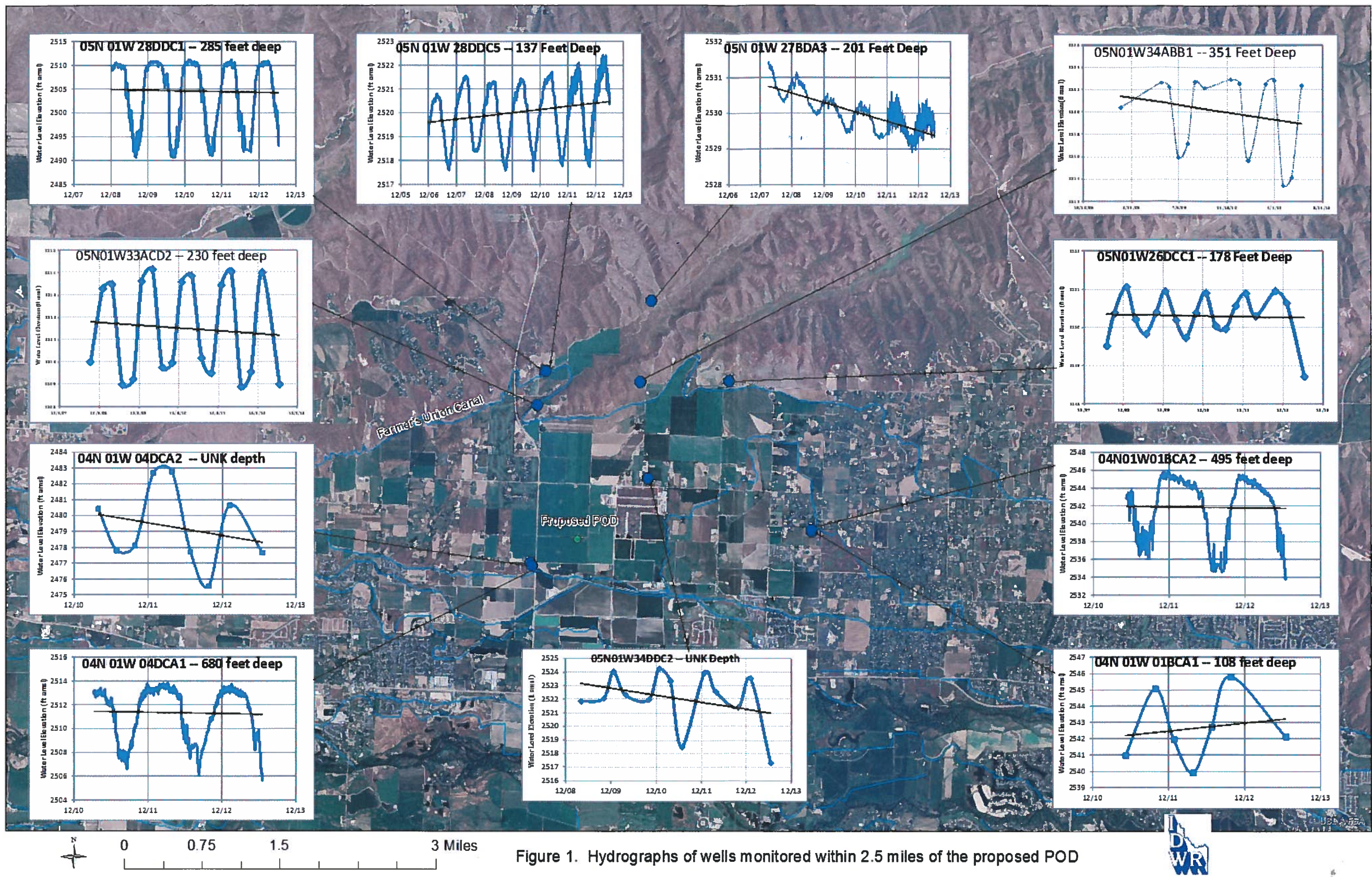


Figure 1. Hydrographs of wells monitored within 2.5 miles of the proposed POD

Monitoring data has been collected during the past seven years, but the observed trends may not necessarily indicate that the trends will continue into the future.

Table 1. Summary of the available data within a 2-mile radius of the proposed POD.

Well ID	Well Depth (ft-bgs)	Open Interval (ft-bgs)	Period of Record	Well Type	Rate of Trend (ft/yr)
04N01W01BCA1	103	98-103	05/2011 – current	Domestic	0.5 Increasing
04N01W01BCA2	495	465-485	05/2011 – current	Monitoring	0.1 Decreasing
04N01W04DCA1	680	640-670	03/2011 – current	Monitoring	0.1 Decreasing
04N01W04DCA2	UNK	UNK	03/2011 – current	Domestic-unused	0.8 Decreasing
05N01W27BDA3	672	181-201	03/2008 - current	Monitoring	0.3 Decreasing
05N01W28DDC5	144	97-137	10/2006 - current	Monitoring	0.1 Increasing
05N01W26DCC1	178	168-178	07/2008 – current	Domestic	0.0 No Trend
05N01W28DDC1	285	278-283	12/2008 – current	Domestic	0.15 Decreasing
05N01W33ACD2	230	221-230	09/2008 – current	Domestic	0.1 Decreasing
05N01W34ABB1	351	341-351	11/2007 - current	Domestic	0.5 Decreasing
05N01W34DDC2	UNK	UNK	04/2009 - current	Irrigation	0.5 Decreasing

Although the overall rate of water level decline is slight, the primary source of recharge (surface water irrigation) to the Treasure Valley aquifers has remained relatively constant. As shown in Figure 2, the rate of diversion in the Farmer's Union Canal (the closest and largest canal system to the proposed POD) has been steady over the duration of the monitoring period, and the water levels in the shallow aquifer have remained stable. Therefore, it appears the withdrawals from the deeper aquifer system are slightly exceeding the amount of recharge to the deep system.

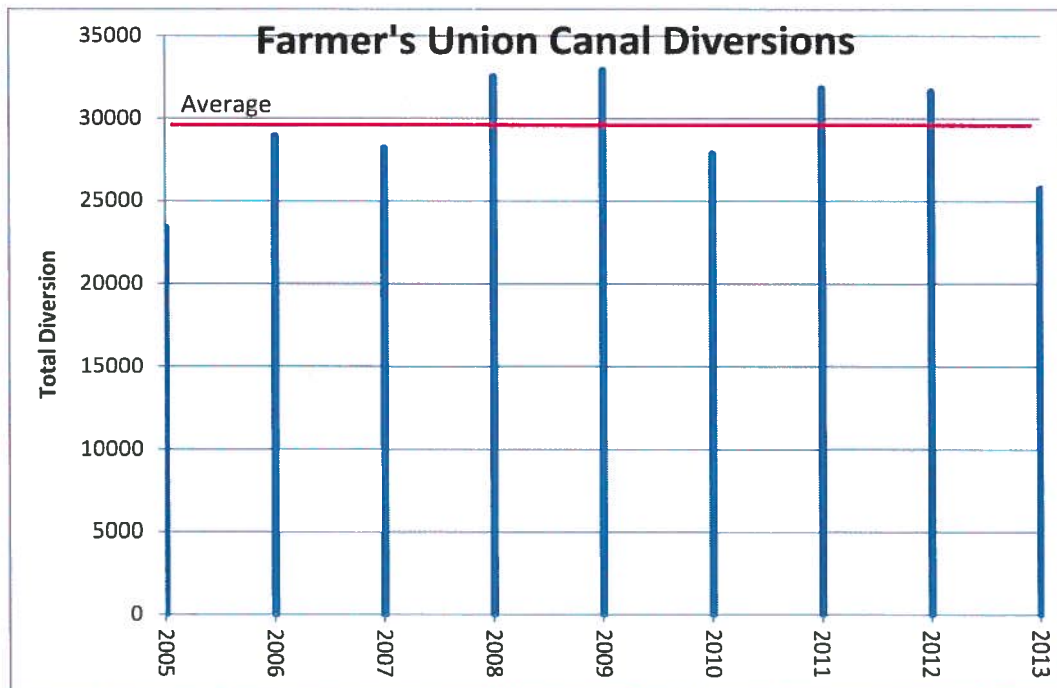


Figure 2. Cumulative diversions to the Farmer's Union Canal.

The response to the diversion and application of surface water can be seen in wells that are completed in the uppermost portion of the aquifer system as water levels rise throughout the irrigation season. With a relatively constant and dependable supply of recharge from the surface water diversions, the wells in the uppermost portion of the aquifer system show stable or slightly increasing water levels. In contrast, the wells completed in the deeper portion of the aquifer below a significant clay horizon show water level declines throughout the irrigation season in response to the municipal, irrigation, and domestic withdrawals from these deeper zones. Due to the fact that water levels in the deep wells have been declining over a several year time span, it appears that only a portion of the recharge that enters the shallow uppermost portion of the aquifer infiltrates or leaks into the deeper portions of the aquifer. This leakage rate has not been quantified, but it appears to be less than the current withdrawal rates from the deeper zones.

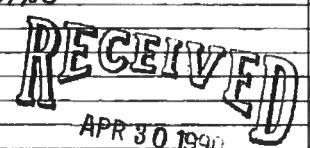
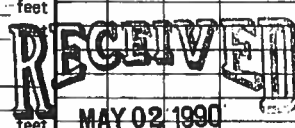
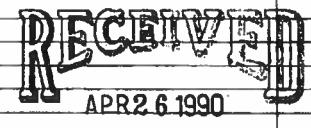
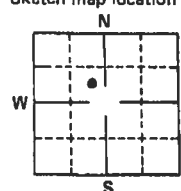
Conclusions

Based on the data available, it appears that the water levels in the shallow aquifer wells that receive recharge from the canal systems are stable or slightly increasing. Wells completed below a significant clay horizon that separates the shallow from the deeper aquifer systems have water levels that are declining slightly. The declining aquifer levels in the deeper aquifer system are an indication that the current withdrawals are exceeding the rate of recharge to these deeper systems. Due to the relatively short duration of the monitoring period, it is unknown whether these declining aquifer levels will continue into the future.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

USE TYPEWRITER OR
BALLPOINT PEN

State law requires that this report be filed with the Director, Department of Water Resources
within 30 days after the completion or abandonment of the well.

1. WELL OWNER Name <u>04N01W01BCA1</u> Address <u>10822 RIPLEY ST. BOISE, IDA</u> Owner's Permit No. <u>63-90-2-081</u>	7. WATER LEVEL Static water level <u>12</u> feet below land surface. Flowing? ☐ Yes ☒ No G.P.M. flow _____ Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature <u>54</u> °F. Quality <u>GOOD</u> Describe artesian or temperature zones below.																																																																																																				
2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Replacement ☐ Well diameter increase ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)	8. WELL TEST DATA ☐ Pump ☐ Bailor ☒ Air ☐ Other _____ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Discharge G.P.M.</th> <th>Pumping Level</th> <th>Hours Pumped</th> </tr> <tr> <td style="text-align: center;"><u>45</u></td> <td style="text-align: center;"><u>75</u></td> <td style="text-align: center;"><u>1</u></td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	Discharge G.P.M.	Pumping Level	Hours Pumped	<u>45</u>	<u>75</u>	<u>1</u>																																																																																														
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3. PROPOSED USE ☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type)	9. LITHOLOGIC LOG 70833 <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Bore Diam.</th> <th colspan="2">Depth</th> <th rowspan="2">Material</th> <th colspan="2">Water</th> </tr> <tr> <th>From</th> <th>To</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>0</td> <td>3</td> <td>TOP SOIL</td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td>3</td> <td>18</td> <td>BROWN CLAY</td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td>18</td> <td>26</td> <td>REDISH CLAY</td> <td></td> <td>☒</td> </tr> <tr> <td>6</td> <td>26</td> <td>35</td> <td>SAND & GRAVEL</td> <td>☒</td> <td></td> </tr> <tr> <td></td> <td>35</td> <td>48</td> <td>SAND</td> <td>☒</td> <td></td> </tr> <tr> <td></td> <td>48</td> <td>52</td> <td>BROWN CLAY</td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td>52</td> <td>56</td> <td>SAND</td> <td>☒</td> <td></td> </tr> <tr> <td></td> <td>56</td> <td>60</td> <td>BROWN CLAY</td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td>60</td> <td>63</td> <td>SAND</td> <td>☒</td> <td></td> </tr> <tr> <td></td> <td>63</td> <td>71</td> <td>BROWN CLAY</td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td>71</td> <td>74</td> <td>SAND</td> <td>☒</td> <td></td> </tr> <tr> <td></td> <td>74</td> <td>85</td> <td>BROWN CLAY</td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td>85</td> <td>88</td> <td>SAND</td> <td>☒</td> <td></td> </tr> <tr> <td></td> <td>88</td> <td>95</td> <td>BROWN CLAY</td> <td></td> <td>☒</td> </tr> <tr> <td></td> <td>95</td> <td>108</td> <td>SAND</td> <td>☒</td> <td></td> </tr> </tbody> </table>	Bore Diam.	Depth		Material	Water		From	To	Yes	No	8	0	3	TOP SOIL		☒		3	18	BROWN CLAY		☒		18	26	REDISH CLAY		☒	6	26	35	SAND & GRAVEL	☒			35	48	SAND	☒			48	52	BROWN CLAY		☒		52	56	SAND	☒			56	60	BROWN CLAY		☒		60	63	SAND	☒			63	71	BROWN CLAY		☒		71	74	SAND	☒			74	85	BROWN CLAY		☒		85	88	SAND	☒			88	95	BROWN CLAY		☒		95	108	SAND	☒	
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5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Thickness</th> <th>Diameter</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td><u>2.50</u> inches</td> <td><u>6</u> inches</td> <td><u>1</u> feet</td> <td><u>96</u> feet</td> </tr> <tr> <td>_____ inches</td> <td>_____ inches</td> <td>_____ feet</td> <td>_____ feet</td> </tr> <tr> <td>_____ inches</td> <td>_____ inches</td> <td>_____ feet</td> <td>_____ feet</td> </tr> <tr> <td>_____ inches</td> <td>_____ inches</td> <td>_____ feet</td> <td>_____ feet</td> </tr> </tbody> </table> Was casing drive shoe used? ☒ Yes ☐ No Was a packer or seal used? ☒ Yes ☐ No Perforated? ☐ Yes ☒ No How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun Size of perforation _____ inches by _____ inches Number _____ From _____ To _____ _____ perforations _____ feet _____ feet _____ perforations _____ feet _____ feet _____ perforations _____ feet _____ feet Well screen installed? ☒ Yes ☐ No Manufacturer's name <u>COOK</u> Type <u>STAINLESS STEEL</u> Model No. <u>304</u> Diameter <u>5</u> Slot size <u>.20</u> Set from <u>98</u> feet to <u>103</u> feet Diameter _____ Slot size _____ Set from _____ feet to _____ feet Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____ Placed from _____ feet to _____ feet Surface seal depth <u>26</u> Material used in seal: ☐ Cement grout ☒ Bentonite ☐ Pudding clay ☐ _____ Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore-to-seal-depth Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata Describe access port _____	Thickness	Diameter	From	To	<u>2.50</u> inches	<u>6</u> inches	<u>1</u> feet	<u>96</u> feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	10. Work started <u>4-15-90</u> finished <u>4-24-90</u>																																																																																
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6. LOCATION OF WELL Sketch map location must agree with location.  Subdivision Name _____ JUN 10 1991 Lot No. _____ Block No. _____	11. DRILLERS CERTIFICATION I/We certify that all minimum well construction standards were complied with at the time the rig was removed. Firm Name <u>COONSE WELL DRILLERS</u> No. <u>409</u> Address <u>EAGLE IDA</u> Date <u>4-24-90</u> Signed by (Firm Official) <u>Gary E. Coonse</u> and																																																																																																				

13

Form 238-7
6/07

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

860581

1. WELL TAG NO. D 0057912

Drilling Permit No. _____

Water right or Injection well # _____

2. OWNER

Name **04N01W04DCA1**

Address **P O Box 83720**

City **Boise**

State **ID**

Zip **83720**

3. WELL LOCATION:

Twp. **4** North ☒ or South ☐ Rge. **1** East ☐ or West ☒

Sec. **4** NE 1/4 SW 1/4 SE 1/4

Gov't Lot _____ County **Ada**

Lat. **43 ° 42.568** (Deg. and Decimal minutes)

Long. **116 ° 27.537** (Deg. and Decimal minutes)

Address of Well Site **1995 N Emmett Hwy**

City **Star**

Lot _____ Blk. _____ Sub. Name _____

4. USE:

☐ Domestic ☐ Municipal ☒ Monitor ☐ Irrigation ☐ Thermal ☐ Injection
☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Replacement well ☐ Modify existing well
☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☐ Air Rotary ☒ Mud Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES

Seal material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method/procedure
cement	4'	96'	43 ft³	tremie
cem/bent	25'	628'	140 ft³	tremie

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
8"	3'	96'	.250	steel	☒	☐	☐	☒
4"	3'	680'	Sc80	PVC	☒	☐	☒	☐

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) _____

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☐ N Method _____

Manufactured screen ☒ Y ☐ N Type **PVC**

Method of Installation **casing string**

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
640'	670'	.020		4"	PVC	sch 80

Length of Headpipe _____ Length of Tailpipe _____

Packer ☐ Y ☒ N Type _____

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method
8 x 12 sand	628'	704'	2,200 lbs	poured & tagged

11. FLOWING ARTESIAN:

Flowing Artesian? ☒ Y ☐ N Artesian Pressure (PSIG) **5 psi @ GL**

Describe control device **valve**

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) **27** Static water level (ft) **+11**

Water temp. (°F) **68** Bottom hole temp. (°F) **77**

Describe access port **valve**

Well test:

Test method:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Pump	Bailer	Air	Flowing artesian
0	100	60	☐	☐	☐	☒

Water Quality test or comments:

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water Y N
12"	0'	10'	brown sandy clay	X
12"	10'	20'	brown sand & small gravel	X
12"	20'	27'	brown sandy clay	X
12"	27'	38'	sand & gravel	X
12"	38'	46'	brown sandy clay	X
12"	46'	58'	brown fine sand	X
12"	58'	94'	tan sticky clay	X
12"	94'	96'	dark grey clay	X
8"	96'	100'	dark grey clay	X
8"	100'	111'	brown/tan clay	X
8"	111'	121'	brown fine sand	X
8"	121'	125'	tan clay	X
8"	125'	156'	grey clay	X
8"	156'	162'	grey fine sands	X
8"	162'	220'	grey clay	X
8"	220'	257'	brown clay w/sand strips	X
8"	257'	368'	grey clay/tan clay w/sand strips	X
8"	368'	397'	grey clay	X
8"	397'	405'	tan sand	X
8"	405'	420'	grey clay	X
8"	420'	440'	tan sands	X
8"	440'	678'	grey sand w/grey clay strips	X
8"	678'	704'	grey clay	X

** Bentonite Chips
3' to 25' between 8" casing & 4" PVC casing

RECEIVED

FEB 17 2011

WATER RESOURCES
WESTERN REGION

Completed Depth (Measurable) **680**

Date: Started **1-11-11** Completed **2-2-11**

14. DRILLER'S CERTIFICATION

I/we certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name **Down Right Drilling & Pump, Inc** Co. No. **637**

*Principal Driller **[Signature]** Date **2-15-11**

*Driller **[Signature]** Date **2-15-11**

*Operator II _____ Date _____

Operator I _____ Date _____

* Signature of Principal Driller and rig operator are required.

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

849721

1. WELL TAG NO. D D0052429 PAGE 1 OF 3

Drilling Permit No. 902734-849721

Water right or injection well #

2. OWNER
Name 05N01W27BDA3

Address 533 E. Riverside Drive, Suite 110

City Eagle State ID Zip 83616

3. WELL LOCATION:

Twp. 5 North ☒ or South ☐ Rge. 1 East ☐ or West ☒

Sec. 27 NW 1/4 SE 1/4 NE 1/4

Gov't Lot County ADA

Lat. 43° 44.812 (Deg. and Decimal minutes)

Long. 116° 26.243 (Deg. and Decimal minutes)

Address of Well Site Big Gulch Rd. 8,000 ft northeast of State Hwy 16

City Eagle

(Give at least name of road + Distance to Road or Landmark)

Lot. Blk. Sub. Name

4. USE:

☐ Domestic ☐ Municipal ☒ Monitor ☐ Irrigation ☐ Thermal ☐ Injection

☒ Other Piezometer Nest

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Replacement well ☐ Modify existing well

☐ Abandonment ☐ Other

6. DRILL METHOD:

☐ Air Rotary ☒ Mud Rotary ☐ Cable ☒ Other Direct Mud-Rotary

7. SEALING PROCEDURES

Seal material	From (ft)	To (ft)	Quantity (lbs or cu. ft)	Placement method/procedure
1/2" bent. chip	0	26	113.4 cu. ft	poured
cement grout	0	55	10.8 cu. ft	pumped

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
24"	+1	26	SC10	steel	☒	☐	☐	☒
8"	+3	27	SC40	steel	☒	☐	☐	☒
2"	+3	61	SC80	PVC-ZONE #1	☒	☐	☒	☐

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s)

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☒ N Method

Manufactured screen ☒ Y ☐ N Type Factory slotted PVC (SCH80)

Method of installation Lowered and tagged into proper depth

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
61	71	0.020	480	2"	PVC	SC80-Zone4
181	201	0.020	480	2"	PVC	SC80-Zone3
326	556	0.020	480	2"	PVC	SC80-Zone2

Length of Headpipe Length of Tailpipe

Packer ☐ Y ☒ N Type

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or cu. ft)	Placement method
#6-#12 sand	55	83	5.6 cu. ft	Poured thru Tremie
#8-#16 sand	166	211	10.5 cu. ft	Poured thru Tremie

11. FLOWING ARTESIAN:

Flowing Artesian? ☐ Y ☒ N Artesian Pressure (PSIG)

Describe control device none

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) Static water level (ft) TABLE PG 3

Water temp (°F) TABLE PG 3 Bottom hole temp (°F) 67.6

Describe access port Four 2" tube wells in a locked steel well head

Well test:

Test method:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Pump	Bailer	Air	Flowing artesian
NO	PUMP TEST	OTHER	☒	☐	☒	☐
THAN	AIR	LIFTING				
AND	PUMP	SAMPLES				

Water Quality test or comments: TABLE PAGE 3

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water Y N
24	0	6	Top soil	X
24	6	25	Tan sand	X
8	25	32	Sticky tan clay	X
8	32	34	Small tan clay mixed with sand	X
8	34	37	Sandy clay	X
8	37	40	Clay & coarse sand	X
8	40	50	Clay with fine-coarse sand	X
8	50	54	Tan sand with some clay	X
8	54	57	Tan clay & sand	X
8	57	59	Tan clay with a little sand	X
8	59	65	Tan clay	X
8	65	66	Tan clay & coarse-fine sand	X
8	66	71	Tan sand	X
8	71	76	Tan clay & sand	X
8	76	84	Tan clay	X
8	84	91	Tan clay & fine tan sand	X
8	91	104	Tan clay with brown tacky clay	X
8	104	136	Blue tacky clay	X
8	136	141	Blue & brown clay	X
8	141	157	Blue clay	X
8	157	163	Brown tacky clay	X
8	163	172	Blue & brown clay	X
8	172	175	Blue clay with a little sand	X
8	175	181	Green & blue clay	X
8	181	185	Tan coarse-fine sand	X
8	185	209	Tan medium-fine sand	X
8	209	214	Blue silty clay	X
8	214	229	Green clay with some blue clay & sand	X
8	229	242	Blue sticky clay	X

CONTINUED ON PAGE 2

Completed Depth (Measurable) 670

Date: Started 11/09/2007 Completed 11/16/2007

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Treasure Valley Drilling Co. No. 560

*Principal Driller Date

*Driller Date

*Operator II Date

Operator I Date

* Signature of Principal Driller and rig operator are required.

b3

Form 238-7
6/07

Pg 1 of 3

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT
Amended

896228-841797

1. WELL TAG NO. D 0047215

Drilling Permit No. **896228-841797**Water right or injection well # **63-32573**

2. OWNER

Name **05N01W28DDC5**Address **533 E. Riverside Drive, Suite, 110**City **Eagle** State **ID** Zip **83816**

3. WELL LOCATION:

Twp. **5** North ☒ or South ☐ Rge. **1** East ☐ or West ☒Sec. **28** SW 1/4 SE 1/4 SE 1/4
15 acres 40 acres 160 acresGov't Lot _____ County **Ada**Lat. **43° 44' 12.39"** (Deg. and Decimal minutes)Long. **116° 27' 28.86"** (Deg. and Decimal minutes)Address of Well Site **Big Gulch Rd., Approx. 2000 ft. NE of State**Highway **16** City **Eagle**

Name of owner of land - Distance to Road or Landmark

Lot. _____ Blk. _____ Sub. Name _____

4. USE:

☐ Domestic ☐ Municipal ☒ Monitor ☐ Irrigation ☐ Thermal ☐ Injection
☒ Other **Piezometer Nest**

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Replacement well ☐ Modify existing well
☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☐ Air Rotary ☒ Mud Rotary ☐ Cable ☐ Other **Direct Mud Rotary**

7. SEALING PROCEDURES

Seal material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method/procedure
30% Grout	800'	580'	2.0 Yds.	Pumped
30% Grout	428'	444'	0.2 Yds.	Pumped

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Unr	Threaded	Welded
8"	+1'	13'	.250	Steel	☒	☐	☐	☒
2"	+3'	514'	Sch80	PVC	☒	☐	☒	☐
2"	+3'	467'	Sch80	PVC	☒	☐	☒	☐

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) **N/A**

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☒ N MethodManufactured screen ☒ Y ☐ N Type **Sch 80 PVC Slotted**Method of Installation **Lowered & Tagged into place**

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
514'	556'	.020	Zone1	2"	PVC	Sch80
467'	507'	.020	Zone2	2"	PVC	Sch80
395'	425'	.020	Zone3	2"	PVC	Sch80

Length of Headpipe **0** Length of Tailpipe **0**Packer ☐ Y ☒ N Type **N/A**

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method
#8-#16 Sand	444'	580'	1.6 Yds	Poured
#8-#16 Sand	305'	428'	0.9 Yds	Poured

11. FLOWING ARTESIAN:

Flowing Artesian? ☐ Y ☒ N Artesian Pressure (PSIG) **See Table on Pg3**

Describe control device _____

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) **91' bgl** Static water level (ft) **91**Water temp (°F) **See Table** Bottom hole temp. (°F) **74.97° F**Describe access port **5 - 2" Tube Wells inside a locked well head**

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)	Test method:	Flowing artesian
NO	PUMP TEST	OTHER	☒ Pump ☒ Bailor ☒ Air ☐	☐
THAN	AIR	LIFTING		
AND	PUMP	SAMPLES		

Water Quality test or comments: **See Table Pg. 2**

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water
15	0	1	Top Soil	X
15	1	3	Caliche	X
15	3	9	Brown Clay	X
8	9	13	Brown Clay	X
8	13	21	Brown Sand	X
8	21	24	Tan Clay	X
8	24	26	Brown Coarse Sand	X
8	26	108	Med. Sands & Tacky Tan - Brwn Clays	X
8	108	111	Med. Slightly Cemented Sand	X
8	111	138	Med Sands & Tacky Tan - Brown Clays	X
8	138	269	Tacky Brown to Dk Greenish Gray Clay	X
8	269	288	Bluish-Gray Clay Lenses	X
8	288	355	Sandy Tacky Greenish- Bluish-Gray Clays	X
8	355	383	Medium Brown Sand	X
8	383	366	Sandy Tan Clay	X
8	366	382	Fine Tan Sand w/ Minor Tan Clay Lenses	X
8	382	388	Sandy Greenish-Gray Clay	X
8	388	393	Fine Tan Sand	X
8	393	398	Sticky Greenish-Gray Clay	X
8	398	403	Medium - Fine Brown Sand	X
8	403	406	Tacky Tan Clay	X
8	406	410	Medium - Fine Brown Sand	X
8	410	417	Sandy Tacky Tan Clay	X
8	417	426	Medium - Coarse Tan Sand	X
8	426	435	Tan Med Sand & Tacky Tan Clay	X
8	435	442	Medium Tan Sand	X
8	442	447	Sandy Tan Clay	X
8	447	449	Fine - Medium Tan Sand	X
8	449	453	Sandy Tan Clay	X
8	453	471	Fine - Medium Tan Sand	X
8	471	481	Coarse Tan Sand	X
8	481	484	Sandy Tan Clay	X

Completed Depth (Measurable) **800'**Date Started **9/5/2006** Completed **9/15/2006**

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed

Company Name **Treasure Valley Drilling** Co. No **560***Principal Driller **[Signature]** Date **9/18/2006***Driller **[Signature]** Date **9/18/2006**

*Operator II _____ Date _____

Operator I _____ Date _____

*Signature of Principal Driller and rig operator are required.

Form provided by Forms On-A-Disk (214) 340-9429 - www.FormsOnADisk.com

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

765865

Office Use Only			
Inspected by _____			
Twp _____	Rge _____	Sec _____	
1/4 _____	1/4 _____	1/4 _____	
Lat: _____	Long: _____		
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian			

1. WELL TAG NO. D 0015332
 DRILLING PERMIT NO. _____
 Other IDWR No. _____

2. OWNER:
 Name 05N01W26DCC1
 Address 4830 N. Hawkwing Lane
 City Eagle State ID Zip 83616

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N		Twp. <u>5</u> North ☒ or South ☐	
E		Rge. <u>1</u> East ☐ or West ☒	
W		Sec. <u>26</u> 1/4 SW 1/4 SE 1/4	
S		Gov't Lot _____ County <u>Ada</u> 10 acres 40 acres 160 acres	
X		Lat: _____ Long: _____	

Address of Well Site 4830 N. Hawkwing
 City Eagle
 Lt. _____ Blk. _____ Sub. _____ Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK	From	To	AMOUNT Sacks or Pounds	METHOD
Bentonite	0	20	600LB	Overbore

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 168 ft

Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	+1.5	168	.25	Steel	☒	☐	☐	☐
5"	163	168	.25	Steel	☐	☒	☐	☐

Length of Headpipe 5 ft Length of Tailpipe _____

9. PERFORATIONS/SCREENS

Perforations Method _____
 Screens Screen Type Alloy Machine

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
168	178	.014	—	5"	Stainless	☐	☒

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

88 ft. below ground Artesian pressure _____ lb.
 Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:

Yield gal/min	Drawdown	Pumping Level	Time
100 GPM	—	165	1 hour

Water Temp. 56° Bottom hole temp. _____

Water Quality test or comments: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment) Depth first Water Encounter 102

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
10	0	2	Top Soil		X
"	2	10	Brown Clay		X
"	10	20	Sandy Clay		X
"	20	30	Sandy Clay		X
"	30	57	Tan Clay		X
"	57	65	Sand		X
"	65	102	Sandy Clay		X
"	102	104	Sand	X	
"	104	118	Tan Clay		X
"	118	122	Sand	X	
"	122	135	Tan Clay		X
"	135	145	Blue Clay		X
"	145	147	Sand	X	
"	147	156	Tan Clay		X
"	156	158	Sand	X	
"	158	160	Tan Clay	X	
"	160	162	Sand	X	
"	162	164	Tan Clay		X
"	164	166	Sand	X	
"	166	168	Blue Clay		X
"	168	178	Sand	X	

RECEIVED

AUG 28 2000

Department of Water Resources

RECEIVED

AUG 18 2000

WATER RESOURCES
WESTERN REGION

Completed Depth 178 ft (Measurable)
 Date: Started 7-29-00 Completed 8-1-00

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Conse Well Drilling Firm No. 409

Firm Official Ray E. Gibson Date 8-1-00

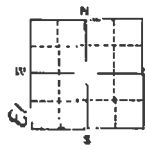
and Driller or Operator Dwight Clark Date 8-1-00
 (Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

USE TYPEWRITER OR
BALLPOINT PEN

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources
within 30 days after the completion or abandonment of the well.

1. WELL OWNER Name <u>05N01W33ACD2</u> Address _____ Owner's Permit No. _____	7. WATER LEVEL Static water level <u>175</u> feet below land surface. Flowing? ☐ Yes ☒ No G.P.M. flow _____ Temperature _____ °F. Quality _____ Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug																																																									
2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Re-perforated ☐ Abandoned (Describe method of abandoning) _____	8. WELL TEST DATA ☒ Pump ☒ Bailor ☐ Other <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Discharge G.P.M.</th> <th>Drawdown</th> <th>Hours Pumped</th> </tr> <tr> <td style="text-align: center;"><u>35</u></td> <td style="text-align: center;"><u>3</u></td> <td style="text-align: center;"><u>3</u></td> </tr> </table>	Discharge G.P.M.	Drawdown	Hours Pumped	<u>35</u>	<u>3</u>	<u>3</u>																																																			
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3. PROPOSED USE ☒ Domestic ☐ Irrigation ☐ Test ☐ Other (specify type) _____ ☐ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection	9. LITHOLOGIC LOG 021593 <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Hole Diam.</th> <th colspan="2">Depth</th> <th rowspan="2">Material</th> <th rowspan="2">Water Yes No</th> </tr> <tr> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><u>6</u></td> <td style="text-align: center;"><u>0</u></td> <td style="text-align: center;"><u>2</u></td> <td><u>top soil</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>2</u></td> <td style="text-align: center;"><u>35</u></td> <td style="text-align: center;"><u></u></td> <td><u>GRAVLE</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>35</u></td> <td style="text-align: center;"><u>171</u></td> <td style="text-align: center;"><u></u></td> <td><u>SANDY CLAY</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>171</u></td> <td style="text-align: center;"><u>175</u></td> <td style="text-align: center;"><u></u></td> <td><u>BROWN CLAY</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>175</u></td> <td style="text-align: center;"><u>200</u></td> <td style="text-align: center;"><u></u></td> <td><u>CLAY & SAND</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>200</u></td> <td style="text-align: center;"><u>210</u></td> <td style="text-align: center;"><u></u></td> <td><u>BROWN CLAY</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>210</u></td> <td style="text-align: center;"><u>220</u></td> <td style="text-align: center;"><u></u></td> <td><u>" SAND</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>220</u></td> <td style="text-align: center;"><u>225</u></td> <td style="text-align: center;"><u></u></td> <td><u>BROWN CLAY</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>225</u></td> <td style="text-align: center;"><u>228</u></td> <td style="text-align: center;"><u></u></td> <td><u>BLUE</u></td> <td style="text-align: center;">☒</td> </tr> <tr> <td style="text-align: center;"><u>228</u></td> <td style="text-align: center;"><u>230</u></td> <td style="text-align: center;"><u></u></td> <td><u>COURSE WHITE SAND</u></td> <td style="text-align: center;">☒</td> </tr> </tbody> </table>	Hole Diam.	Depth		Material	Water Yes No	From	To	<u>6</u>	<u>0</u>	<u>2</u>	<u>top soil</u>	☒	<u>2</u>	<u>35</u>	<u></u>	<u>GRAVLE</u>	☒	<u>35</u>	<u>171</u>	<u></u>	<u>SANDY CLAY</u>	☒	<u>171</u>	<u>175</u>	<u></u>	<u>BROWN CLAY</u>	☒	<u>175</u>	<u>200</u>	<u></u>	<u>CLAY & SAND</u>	☒	<u>200</u>	<u>210</u>	<u></u>	<u>BROWN CLAY</u>	☒	<u>210</u>	<u>220</u>	<u></u>	<u>" SAND</u>	☒	<u>220</u>	<u>225</u>	<u></u>	<u>BROWN CLAY</u>	☒	<u>225</u>	<u>228</u>	<u></u>	<u>BLUE</u>	☒	<u>228</u>	<u>230</u>	<u></u>	<u>COURSE WHITE SAND</u>	☒
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4. METHOD DRILLED ☒ Cable ☐ Rotary ☐ Dug ☐ Other	RECEIVED DEC 15 1978 Department of Water Resources Western Regional Office																																																									
5. WELL CONSTRUCTION Diameter of hole <u>6</u> inches Total depth <u>230</u> feet Casing schedule: ☒ Steel ☐ Concrete Thickness <u>250</u> inches Diameter <u>6</u> inches <u>171</u> feet inches inches feet feet inches inches feet feet inches inches feet feet inches inches feet feet Was casing drive shoe used? ☒ Yes ☐ No Was a packer or seal used? ☐ Yes ☒ No Perforated? ☐ Yes ☒ No How perforated? ☐ Factory ☐ Knife ☐ Torch Size of perforation _____ inches by _____ inches Number _____ From _____ To _____ perforations _____ feet _____ feet perforations _____ feet _____ feet perforations _____ feet _____ feet Well screens installed? ☐ Yes ☒ No Manufacturer's name _____ Type _____ Model No. _____ Diameter _____ Slot size _____ Set from _____ feet to _____ feet Diameter _____ Slot size _____ Set from _____ feet to _____ feet Gravel packed? ☐ Yes ☐ No Size of gravel _____ Placed from _____ feet to _____ feet Surface seal depth <u>30</u> Material used in seal: ☐ Cement grout ☐ Puddling clay ☒ Well cuttings Sealing procedure used: ☐ Slurry pit ☐ Temporary surface casing <u>Blue clay</u> ☐ Overbore to seal depth																																																										
6. LOCATION OF WELL Sketch map location must agree with written location. <u>63</u>  Subdivision Name _____ Lot No. _____ Block No. _____ County <u>Ada</u> <u>S1W</u> & <u>NE</u> Sec. <u>33</u> T. <u>5</u> N. S. R. <u>11</u> W <u>range</u>	10. Work started <u>JUNE 14</u> finished <u>JUNE 28</u> 11. DRILLERS CERTIFICATION Firm Name <u>Russell Cance</u> Firm No. <u>65</u> Address <u>Boise Idaho</u> Date _____ Signed by (Firm Official) <u>Russell Cance</u> and <u>Ben McFarlin</u> (Operator)																																																									

USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT

094027

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
_____ 1/4 _____ 1/4 _____ 1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 63-10-96-301 - END
Other IDWR No. _____

2. OWNER: 05N01W34ABB1

Name _____
Address 4795 N. Hanley
City Eagle State MO Zip 83616

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.


 Twp. 5 North ☒ or South ☐
 Rge. 1 East ☐ or West ☒
 Sec. 34 NW 1/4 NE 1/4 SE 1/4
 Gov't Lot _____ County Ala 10 acres 160 acres
 Lat: _____ Long: _____

Address of Well Site 4795 N. Hantley City Eagle
(Give at least name of road + Distance to Road of Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD

☒ Air Rotary ☒ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK			AMOUNT	METHOD
Material	From	To	Sacks or Pounds	
Bentonite	0	18	300	Pours.

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6	1	340	250	Steel	☐	☐	☐	☐
5	336	341	238	Steel	☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe 5' 2" Length of Tailpipe 0

9. PERFORATIONS/SCREENS

☐ Perforations Method 304 Str. rules
☒ Screens Screen Type Johnson

From	To	Slot Size	Number	Diameter	Material	Casing	liner
34	351	.015		5		☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

130 ft below ground Artesian pressure _____ lb.

Depth flow encountered _____ ft. Describe access port or control devices: Well Seal

11. WELL TESTS:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian			
Yield gal/min.	Drawdown	Pumping Level	Time
26			4

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment) _____

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
8	0	8	Top Soil		X
	2	10	Clay		X
	10	52	Sandy clay		X
	52	80	Clay		X
	80	120	Sandy clay		X
	120	130	SANDY clay streaks		X
	130	152	Sandy clay		X
	152	203	Sandy clay		X
	203	220	C-Sandy - clay streaks	X	
	220	246	Blue sandy clay	X	
	246	265	Blue clay - SAND streaks	X	
	265	285	Blue clay - sand streaks	X	
	285	303	Blue clay		X
	303	310	Brown clay		X
	310	318	Blue clay - SAND streaks	X	
	318	325	SAND - clay streaks	X	
	325	329	Blue clay		X
	329	331	SAND	X	
	331	339	Sandy clay	X	
	339	351	Brown sand	X	

~~RECEIVED~~ ~~RECEIVED~~

JUN 28 1996 JUL 16 1996

WATER RESOURCES
WESTERN REGION Department of Water Resources

~~SEP 11 1996~~

Completed Depth 351 (Measurable)
Date: Started 5-20-96 Completed 6-18-91

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed

Firm Name Dennis Pharis Firm No. 332

Firm Official, Don Kitzing Date 6-28-56

Supervisor or Operator _____ Date _____

(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES