



# WATER WELL REPORT

Original & 1<sup>st</sup> copy - Ecology, 2<sup>nd</sup> copy - owner, 3<sup>rd</sup> copy - driller

Construction/Decommission ("x" in circle)

☒ Construction

☐ Decommission ORIGINAL INSTALLATION Notice  
of Intent Number 176670

PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal  
☐ DeWater ☒ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_  
☒ New well ☐ Reconditioned Method: ☐ Dug ☒ Bored ☐ Driven  
☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 16" inches, drilled 460' ft.  
Depth of completed well 460' ft.

CONSTRUCTION DETAILS  
Casing ☒ Welded 24" Diam from +1 ft to 20' ft  
Installed: ☒ Liner installed 16" Diam from +1 ft to 193' ft  
☐ Threaded Diam from \_\_\_\_\_ ft to \_\_\_\_\_ ft

Perforations: ☐ Yes ☒ No  
Type of perforator used \_\_\_\_\_  
SIZE of perfs \_\_\_\_\_ in. by \_\_\_\_\_ in. and no. of perfs from \_\_\_\_\_ ft to \_\_\_\_\_ ft

Screens: ☐ Yes ☒ No ☐ K-Pac Location \_\_\_\_\_  
Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No \_\_\_\_\_  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Materials placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 193' ft.  
Material used in seal cement  
Did any strata contain unusable water? ☐ Yes ☒ No  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

PUMP: Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ HP \_\_\_\_\_

WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.  
Static level 208' ft. below top of well Date \_\_\_\_\_  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? ☐ Yes ☒ No If yes, by whom? \_\_\_\_\_  
Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time  | Water Level | Time  | Water Level | Time  | Water Level |
|-------|-------------|-------|-------------|-------|-------------|
| _____ | _____       | _____ | _____       | _____ | _____       |
| _____ | _____       | _____ | _____       | _____ | _____       |

Date of test \_\_\_\_\_

Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Airtest 1200 gal./min. with stem set at 400 ft. for 1 hrs.

Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was a chemical analysis made? ☐ Yes ☒ No

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☐ Trainee Name (Print) Larry McLanahan  
Driller/Engineer/Trainee Signature [Signature]  
Driller or trainee License No. 0337

If TRAINEE,  
Driller's Licensed No. \_\_\_\_\_  
Driller's Signature \_\_\_\_\_

## CURRENT

Notice of Intent No. AHP775

Unique Ecology Well ID Tag No. W150757

Water Right Permit No. G4-34963

Property Owner Name Archie DenHood

Well Street Address 62801 N. Griffin Rd.

City Grandview County BENTON

Location NW1/4-1/4 SW1/4 Sec 32 Twn 10N R 24 EWM ☒ circle  
or WWM ☐ one

Lat/Long (s, t, r) Lat Deg \_\_\_\_\_ Lat Min/Sec \_\_\_\_\_

Still REQUIRED) Long Deg \_\_\_\_\_ Long Min/Sec \_\_\_\_\_

Tax Parcel No. \_\_\_\_\_

## CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

| MATERIAL                                          | FROM | TO  |
|---------------------------------------------------|------|-----|
| Brown Silty Soil                                  | 0    | 5   |
| Caliche & Broken rock                             | 5    | 15  |
| Med. hard gray & brown basalt                     | 15   | 44  |
| Med. soft brown & gray basalt                     | 44   | 56  |
| Hard gray basalt                                  | 56   | 65  |
| Med. hard gray & brown basalt                     | 65   | 106 |
| Soft brown clay                                   | 106  | 144 |
| Brown Sandstone                                   | 144  | 176 |
| Soft broken brown basalt                          | 176  | 193 |
| Hard gray basalt                                  | 193  | 207 |
| Soft reddish brown visicular basalt some tan      |      |     |
| claystone Little water 30gpm                      | 207  | 218 |
| Med. hard gray & brown basalt                     | 218  | 236 |
| Hard gray basalt                                  | 236  | 298 |
| Soft broken brown basalt Some visicular with      |      |     |
| Brown clay Water 400                              | 298  | 337 |
| Med. hard brown & gray basalt                     | 337  | 342 |
| Med. soft dark gray porous basalt some green clay | 342  | 353 |
| Med. hard dark gray basalt 600 water              | 353  | 381 |
| Fractured dark gray basalt                        | 381  | 384 |
| Med. hard fractured gray basalt                   | 384  | 405 |
| Hard gray basalt 110 psi Rig air only             | 405  | 460 |

16" pipe to 193'  
15" & 14 7/8 to 456'

RECEIVED  
JUL 01 2019  
Dept of Ecology  
Central Regional Office

Start Date 5-24-05 Completed Date 6-6-05

Drilling Company BJ Exploration Co., Inc.

Address 404 N. Conway Street

City, State, Zip Kennewick, WA 99336

Contractor's

Registration No. BJENPC1132QK

Date 6-23-05

Ecology is an Equal Opportunity Employer





## MEMORANDUM

Project No.: 170289-002-02

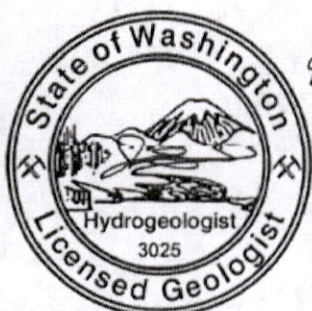
September 18, 2018

**To:** Trevor Hutton, Washington State Department of Ecology

**RECEIVED**

**JUL 01 2019**

**Dept of Ecology  
Central Regional Office**



Jason Michael Shira

**From:** Jason M. Shira, LHG  
Project Hydrogeologist

Tyson D. Carlson, LHG  
Associate Hydrogeologist

**Re: Hydrogeologic Investigation  
Flying M Ranch – den Hoed Water Right Transfer**

This memorandum presents the findings of Aspect Consulting, LLC's (Aspect) hydrogeologic investigation completed in support of permitting a new groundwater right to Archie and Mari den Hoed (den Hoed), located 4 miles northeast of Grandview, Washington. The den Hoeds are currently under contract to purchase a portion of a senior (pre-1905) water right from the Flying M Ranch located on the Yakima River near Ellensburg. The water right will enable the den Hoeds to plant additional acreage located within the Roza Irrigation District (Roza) boundaries, and will provide for on-farm operational flexibility and drought resiliency. The project proposes to change the source water rights to mitigation and instream flow, then receive a new water budget neutral water right using consumptive use mitigation credits from Washington State's Trust Water Right Program (TWRP). The new water budget water right would authorize the den Hoeds to withdraw groundwater up to 117 acre-feet (100 acre-feet (consumptive use)) from one well completed in the Lower Saddle Mountain Aquifer for irrigation of 40 acres.

To facilitate the transfer, Aspect has completed processing of three water right change applications with the Kittitas County Water Conservancy Board (KIT-17-05, KIT-17-06, KIT-17-07) that are currently under review by the Washington State Department of Ecology (Ecology). In addition, Aspect completed a site-specific hydrogeologic investigation using a multiple line of evidence approach that used the best available data describing the hydrogeology surrounding the den Hoed well. The objective of the investigation was to determine if water is physically available, if the

September 18, 2018

## MEMORANDUM

Project No.: 170289-002-02

proposed points of withdrawal are in hydraulic continuity with the adjacent reach of the Yakima River, and whether local impairment of senior water rights would occur. This information is being provided to Ecology for review in advance of submitting a new water budget neutral application and supporting front-loaded water right documents.

### Summary of Findings

Based on review of the available information and understanding of the site-specific hydrogeologic conceptual model presented below, we observed the following:

- The den Hoed proposed point of withdrawal (well) is completed in the Lower Saddle Mountains Aquifer. The well is located in a synclinal basin, flanked by two anticlines to the north and south. Based on review of well logs and water levels, the anticlines do not appear to be barriers to groundwater flow;
- Water-bearing intervals in the den Hoed well consist of the Selah Interbed and Umatilla Member contact and fractured Umatilla Member of the Saddle Mountains Basalt. Transmissivity of the local bedrock aquifer is estimated at approximately 1,750 feet<sup>2</sup>/day. At-time-of-drilling (ATD) water level in 2005 was reported at 208 feet below ground surface (bgs);
- Contemporary water levels collected in the den Hoed well indicate groundwater elevations have seasonally risen up to 18 feet since 2005. In addition, Ecology monitors groundwater levels in five wells that are proximal to the den Hoed well. Review of the recent (18 years) groundwater elevations in these wells show no discernable trend or long-term decline. In addition, water levels in the Saddle Mountain Basalt aquifer have recovered from drawdowns associated with multiple past emergency drought year withdrawals.
- In Saddle Mountains Basalt aquifer wells Ecology data indicate higher water levels are associated with late fall to early spring; lower water levels typically occur in spring to late summer. The higher fall groundwater elevations indicate that the Saddle Mountains Basalt aquifer likely receives direct annual recharge from surface irrigation return flows.
- A water budget analysis was completed for the area between the two local anticlines. For this area, the primary and supplemental (nonadditive) water rights identified above equal about 2.4 and 7.6 inches, respectively. The proposed transfer is equal to about 0.39 inches over the same area. Cumulatively, the sum of these water rights is conservatively estimated to be less than half of the total annual recharge (22.5 inches) reported by Vaccaro (2009).
- Interference drawdown from continuously pumping the proposed well at an average withdrawal rate (135 gallons per minute (gpm)) for the 7.5-month irrigation season is estimated to be less than 7.3 feet. Peak pumping (withdrawal of 360 gpm for 30 continuous days) results in less than 8.3 feet of drawdown. Both estimates conservatively assume no leakage or boundary conditions and are a small percentage of the estimated 300 feet of total available drawdown in the Lower Saddle Mountain Aquifer; and
- The proposed water right transfer will be water budget neutral with respect to Total Water Supply Available (TWSA) in the Yakima River Basin as measured at the Prosser gage. In



## MEMORANDUM

September 18, 2018

Project No.: 170289-002-02

addition, no perennial surface water body is mapped within 5,000 feet of the applicant's property, and the closest surface water body listed by Washington State Department of Fish and Wildlife (WDFW) database to have Endangered Species Act (ESA)-listed species is the Yakima River, located about 6.8 miles southwest of the property.

We therefore conclude that groundwater in the Lower Saddle Mountains Aquifer is physically available for appropriation; groundwater withdrawals in the Lower Saddle Mountains Aquifer are in hydraulic continuity with the Yakima River; and authorization of the proposed well will not impair nearby groundwater users, surface water, or ESA-listed species. Supporting analysis for these findings is presented in the sections below.

### **Hydrogeologic Investigation**

Structural setting, geologic history, and occurrence of groundwater provide the basis for our interpretation of site-specific hydrogeology and the hydraulic continuity between the Saddle Mountains Aquifer and the mainstem Yakima River. A description of the geologic setting and stratigraphic units of the area are discussed below.

#### ***Proposed Point of Withdrawal***

The proposed point of withdrawal (10N/24NE-32M1) is located about 4 miles northeast of Grandview, just east of the Benton County line in the northeast quarter of the southwest quarter of Section 32 in Township 10 North, Range 24 East Willamette Meridian (E.W.M) as shown on Figure 1. Aspect staff field located the well using GPS, and notes the driller's log mistakenly lists the well as located in the northwest quarter of the southwest quarter of the section.

The well was constructed as an emergency drought well in 2005. The well was drilled and constructed between May 24 and June 6, 2005 using a rotary drilling method. The well was completed to a depth of 460 bgs. A 24-inch-diameter conductor casing extends from 1 foot above ground surface (ags) to 20 feet bgs, and a 16-inch-diameter liner extends from 1 foot ags to 193 feet bgs. The surface seal extends 193 feet to the bottom of the 16-inch-diameter liner. A 15 to 14 7/8-inch-diameter liner extends from 193 to 456 feet bgs.

Water bearing zones are encountered between 207 to 218, 298 to 337, and 342 to 353 feet bgs with an increase in water production corresponding to the Selah Interbed and Umatilla Member contact and fractured Umatilla Member. The well air tested at 1,200 gallons per minute (gpm) with the stem set at 400 feet bgs. The at-time-of-drilling (ATD) water level was reported at 208 feet bgs.

#### ***Regional Geology***

Local geologic characteristics are largely the result of regional tectonic processes. The den Hoed well is located in the lower Yakima River Valley, east of the Cascade Mountains, within the Yakima Fold Belt, a subprovince of the Columbia Basin. The well is on the south arm of the northeast-southwest trending Sagebrush Ridge anticline, and is flanked to the south by the Grandview Butte anticline as shown on Figure 2.

Regional bedrock is dominated by the Columbia River Basalt Group (CRBG), a series of stacked basalt flows and sedimentary interbeds that were deposited between 17 and 6 million years ago. Although sedimentary interbeds are present in all CRBG formations, the Saddle Mountain Basalt formation generally contains the most and the thickest sedimentary interbeds (Vaccaro et al., 2009).



## MEMORANDUM

September 18, 2018

Project No.: 170289-002-02

Folding, faulting, and uplift of CRBG formations within the Yakima Fold Belt began concurrent with placement of CRBG formations and have continued to the present.

### ***Site Hydrostratigraphic Units***

Surficial geology is shown in Figure 2. Geologic unit and structural data from the Washington State Department of Natural Resources (DNR, 2018), and select water well log data from the Washington Department of Ecology (Ecology) on-line water well database (included as Attachment 1) were used to develop the subsurface interpretation. This interpretation is presented in cross section as Figures 3 and 4. Local data indicate that there are two principal geologic units at the property. From younger to older, these are unconsolidated quaternary sediments and the CRBG. The characteristics and distribution of each unit is described as follows:

- **Quaternary Sediments** - The property is overlain by loess deposits (Ql), a windblown silt. Well log data from Ecology's records indicate the thickness of sediments overlying basalt near the project well range from 4 to 20 feet thick.
- **Columbia River Basalt Group** - The CRBG is the basement unit in the area. Rocks of the Saddle Mountain Formation are mapped at the surface within one mile of the property. The Saddle Mountains Basalt Formation includes (from youngest to oldest) the following flow members and sedimentary interbeds:
  - ***Elephant Member*** described as black, brown, or grey; medium to very hard basalt; and 90 feet thick in driller's logs. The Elephant Member is not typically a water source in the project area.
  - ***Rattlesnake Ridge Interbed*** described as brown or tan, soft clay to sandstone, and 70 to 90 feet thick in driller's logs. The Rattlesnake Ridge Interbed is not typically a water source in the project area, except for some domestic water supply wells.
  - ***Pomona Member*** described as black, brown, grey, or some red; soft, medium, or hard basalt; 70 to 170+ feet thick in driller's logs. The Pomona Member is a water source for many domestic and irrigation wells in the project area.
  - ***Selah Interbed*** described as brown, tan, or grey; clay to sandstone; and 0 to 30 feet thick in driller's logs. The contact between the Selah Interbed and Umatilla, where the Selah Interbed is present, or the interflow zone, where the Selah Interbed is not present, are productive water bearing zones.
  - ***Umatilla Member*** described as black, brown, grey; hard; broken, fractured; basalt; and approximately 90 feet thick in driller's logs. The Umatilla Member is a water source for many wells in the project area. This member also appears to be heavily fractured over a large aerial extent, and a productive water bearing zone.

The thickness of the Saddle Mountains Basalt Formation, basalt flows plus interbeds, near the property is estimated at approximately 500 feet (Jones 2009). Collectively, saturated layers within the Saddle Mountains Basalt Formation form the Saddle Mountains Basalt Aquifer.

The Wanapum Basalt Formation underlies the Saddle Mountains Basalt Formation. Wells near the project area are not completed in the Wanapum; however, two wells (CRGWDB-201712 and 10N/24E-31C1) are double completed in the Saddle Mountain and Wanapum



## MEMORANDUM

September 18, 2018

Project No.: 170289-002-02

Basalt. The uppermost member of the Wanapum Basalt Formation, Priest Rapids Member, is overlain by the Mabton Interbed, a regional marker bed.

### Aquifer Characteristics

Aquifer parameters of the Saddle Mountains Basalt Aquifer were estimated using flow rates from airlift pumping tests and Driscoll's empirical equation (Driscoll, 1986). The median horizontal hydraulic conductivity within the Saddle Mountains Basalt Aquifer was estimated at  $4.1 \times 10^{-3}$  cm/s (12 feet/day), or a transmissivity of 1,750 feet<sup>2</sup>/day assuming an average aquifer thickness of 150 feet (from examination of well logs).

The resulting horizontal hydraulic conductivity is greater than that found by Vaccaro et al., 2009 (1 to 2 feet/day) in their review of existing reports and used by Ely et al., 2011 in their numerical simulation. This discrepancy is likely due to the presence of significant fracture zones locally documented in the upper Umatilla Member that result in a relative high (140 feet/day) hydraulic conductivity.

### Water levels

Ecology monitors groundwater levels in five wells that are proximal to this project well as noted in Figure 2. Figure 5 also illustrates the location and completion of each of the wells and water levels ATD. Figure 6 presents the autumn (fall) data for the most recent 18 years (2000 to present), while Figure 7 presents spring water level measurements. Inspection of these data show no discernable trend or long-term decline. Moreover, water levels recover following increased drought year (i.e., 2005 and 2015) withdrawals in wells completed in members of the Saddle Mountains Basalt Aquifer. However, it is noted that water levels did not recover in wells completed in the Wanapum Basalt Aquifer (note both Well CRGWDB-201712 and 10N/24E-31C1 are double completed and open across the members of both the Saddle Mountains Basalt and Wanapum Aquifers). The figures also illustrate the strong downward vertical hydraulic gradient between the Saddle Mountains Basalt water bearing members and the Wanapum Basalt Aquifers, and the influence of the double completed wells have on area water levels.

Figure 8 is a plot of static water level (SWL) elevations at time of drilling. Wells completed in the Saddle Mountains Basalt Aquifer tend to have a SWL elevation between 950 and 1,100 feet depending on location. Well 10N/24E-31E1 does not plot within the observed range of elevations. The reason for the lower SWL elevation is likely due to drawdown induced by a cascading water condition in the nearby double-completed wells. This nearby induced drawdown has also lowered water levels in CRGWDB-201804 below the elevation of other wells completed in the Saddle Mountains Basalt Aquifer as seen in Figures 5 and 6. Other than the outliers noted, these data also show no discernable or long-term decline in Saddle Mountains Basalt water levels.

Figure 9 presents the monthly groundwater elevation statistics for the Ecology monitored wells. In general, the box-plot indicates higher water levels are associated with late fall to early spring; lower water levels typically occur in spring to late summer in the Saddle Mountains Basalt Aquifer wells. The exception is well CRGWDB-201804, which is affected by the induced drawdown of nearby cascading wells. The higher fall groundwater elevations indicate that the Saddle Mountains Basalt Aquifer likely receives direct annual recharge from surface irrigation return flows.

Aspect collected water level measurements in the subject well during the hydrogeologic investigation. The measurements were collected with a direct read electronic well sounder. The



## MEMORANDUM

Project No.: 170289-002-02

September 18, 2018

measurements indicate that the water level in the den Hoed well are currently 9 to nearly 18 feet higher than the reported ATD of 208 feet bgs and are summarized in the table below.

**Table 1. den Hoed Water Level Measurements**

| Date            | Depth to Water (feet bgs) | Groundwater Elevation (feet amsl) |
|-----------------|---------------------------|-----------------------------------|
| 6/06/2005 (ATD) | 208.00                    | 985.7                             |
| 8/30/2017       | 192.09                    | 1,001.6                           |
| 11/21/2017      | 190.30                    | 1,003.4                           |
| 2/23/2018       | 199.15                    | 994.6                             |

Inspection of the water levels indicate that groundwater levels are significantly higher than what was observed in 2005. In addition, water level elevations were highest following the irrigation season, and slowly decreased during the winter months, similar to the surrounding groundwater trends noted above.

### Local Water Budget

To inform a local water availability determination, Aspect evaluated local estimates of groundwater recharge in the Yakima River Basin, as reported by Vaccaro and Olsen (2007). The study included developing two models to estimate groundwater recharge for predevelopment and current conditions. The overall objective of the study was to describe the groundwater flow system and its interaction with and relation to surface water, and to provide baseline information. The baseline information is then intended to be used to guide and support action taken by management agencies (i.e., Ecology) with respect to groundwater availability.

The model(s) determined that the basin-wide mean annual recharge under current land-use conditions was about 15.6 inches, or about 7,132 ft<sup>3</sup>/s. Specific to the area representative of the den Hoed well (Prosser; Identification No. 10), modeling results indicate that annual precipitation is about 7.9 inches, irrigation is 44.9 inches, and annual recharge is 22.5 inches. In addition, Vaccaro et al. (2009) evaluated differences between annual and cumulative pumpage and recharge at a smaller scale across the basin. For the area representative of the den Hoed well, Vaccaro (2009) found the difference between cumulative (1960 to 2001) groundwater recharge and pumpage is greater than 20 feet.

### Existing Water Rights

The location and type of water right located in the area between the anticlines was queried in Ecology's Water Resource Explorer. The query indicated that 14 certificates were on record. Eleven of the water rights were supplemental (non-additive) to Roza. Three are considered primary water rights for irrigation of about 132 acres. Coincidentally, the water rights (Nos. G4-23965CWRIS, G4-24765CWRIS, G4-25907GWRIS) are associated with the same double completed wells noted above. In addition, 19 groundwater claims were also on record with priority dates later than 1945. There are 9 new applications, 7 of the applications are for 1994 or 2001 emergency drought authorization and 2 for new unmitigated primary water rights already served by Roza, which are not considered to be TWSA neutral.

For comparison, the area between the two anticlines is conservatively estimated to be about 5.5 square miles. For this area, the primary and supplemental (nonadditive) water rights identified



## MEMORANDUM

September 18, 2018

Project No.: 170289-002-02

above equal about 2.4 and 7.6 inches, respectively. Similarly, the proposed transfer is equal to about 0.39 inches. Cumulatively, the sum of these water rights is conservatively estimated to be less than half of the total annual recharge estimated by Vaccaro (2009).

Ecology estimates that a total of approximately 2,218 acre-feet was withdrawn in emergency drought authorizations during the 2015 drought. As metered, between the 2005 and 2015 droughts, the den Hoed well has withdrawn a total of 186.5 acre-feet.

### Hydrogeologic Conceptual Model

The den Hoed's existing well withdraws groundwater from the Lower Saddle Mountains Aquifer. Saddle Mountains Basalt are mapped at ground surface within one mile of the subject well and extend to below the Yakima River to the south. Drawdown effects from pumping of the proposed wells would reduce lateral groundwater flow which, in turn, would reduce baseflow contribution to the Yakima River through the overlying unconsolidated sediments and impact TWSA. In addition, there are no geologic structures (e.g., folds or faults) mapped between the existing wells and the Yakima River that behave as a barrier to groundwater flow. Therefore, the proposed well completed in the Lower Saddle Mountains Aquifer is considered to be in hydraulic continuity and competing for water with the Yakima River.

Aspect contacted Ecology about groundwater management in the area. Ecology manages shallow alluvium and basin-fill deposits as a single unit, and is considered to be in high continuity with local surface water. However, the Saddle Mountains may be managed as one or two sources, depending on local characteristics. For instance, the Upper Saddle Mountains Aquifer includes all saturated materials above the Pomona Member of the Saddle Mountain Basalt. In the Upper Saddle Mountain Aquifer, where saturated, groundwater flow directions are driven by the recharge of precipitation and generally correspond to surface topography—with groundwater percolating through fractures or exposed interbeds and flow tops along the axis of an anticline, and flow trending toward regional discharge points (i.e., Yakima River). The Lower Saddle Mountain Aquifer includes all materials below including the Pomona Member.

Depending on thickness and characteristics of the overlying sediments, the Lower Saddle Mountains may also respond to seasonal recharge, or may be more confined and isolated from the surface and influence of regional discharge points. In the area of the den Hoed well, the Lower Saddle Mountains Aquifer readily responds to seasonal recharge from the ground surface. Specifically, the water levels in the den Hoed well seasonally respond to recharge, and have risen up to 18 feet since 2005. Below the Saddle Mountains, Ecology typically considers water-bearing zones within the Wanapum Formation to be a distinct aquifer (i.e., Wanapum Aquifer).

### Local Availability

Following construction of the den Hoed well in 2005, the well was tested at 1,200 gpm with the stem set at 400 feet bgs for one hour. Since that time, the well was pumped during both the 2005 and 2015 drought years at about 1,000 gpm. Assuming the den Hoed irrigation requirement is approximately equal to 9 gpm per acre, or 360 gpm for the irrigation or 40 acres, the well is more than capable of meeting the instantaneous demand.

Water levels collected in the den Hoed well indicate groundwater elevation have seasonally risen up to 18 feet since 2005. In addition, Ecology monitors groundwater levels in five wells that are



## MEMORANDUM

Project No.: 170289-002-02

September 18, 2018

proximal to the den Hoed well. Review of the contemporary groundwater elevations in these wells show no discernable trend or long-term decline in the Saddle Mountains Basalt Aquifer. In addition, water levels in the Saddle Mountain Basalt Aquifer continue to recover from drawdowns associated with emergency drought year withdrawals.

A water budget analysis was completed for the area between the two local anticlines. For this area, the primary and supplemental (nonadditive) water rights identified above equal about 2.4 and 7.6 inches, respectively. The proposed transfer is equal to about 0.39 inches over the same area. Cumulatively, the sum of these water rights is conservatively estimated to be less than half of the total annual recharge (22.5 inches) reported by Vaccaro (2009). Therefore, based on this information, water is found to be physically available in the Saddle Mountains Basalt aquifer.

The suitability of water rights for mitigation in the lower Yakima Basin are illustrated in Ecology's Central and Lower Yakima Basin Water Exchange Mitigation Suitability Map. The den Hoed well is located just east of the Yakima-Benton County line, directly east of Sunnyside, in the green area. The green area is defined as being suitable for mitigation of TWSA with a pre-1905 mainstem water right.

### Impairment Analysis

Revised Code of Washington (RCW) 90.03.290 and RCW 90.44.060 require a determination that a water right change will not impair existing water rights. The closest non-den Hoed well to the proposed well is a permit-exempt water supply well (10N/24E-32P1) located 1,315 feet away. The closest primary water right for Saddle Mountains Basalt aquifer is located 5,460 feet from the den Hoed well, and is associated with well 10N/24E-31C1.

Using the aquifer parameters above and an estimated storage coefficient of  $1.0 \times 10^{-3}$ , the governing Theis equation (Theis, 1935) was used to estimate the interference drawdown from pumping the proposed well at 135 gpm, which is the rate to pump the requested annual quantity over the proposed irrigation season (April 1 to October 15). Based on this analysis, the interference drawdown is estimated to be less than 7.3 feet at the domestic well at the end of 197 days of pumping, and less than 4.0 feet in the 10N/24E-31C1 well located 5,460 feet from the proposed well. Peak pumping (withdrawal of 360 gpm for 30 continuous days) results in less than 8.3 and 3.0 feet of drawdown, respectively. Both estimates conservatively assume no leakage or boundary conditions and are a small percentage of the estimated 300 feet of total available drawdown in the Lower Saddle Mountain Aquifer.

The increase in drawdown in the domestic well (10N/24E-32P1) and the primary water right well (10N/24E-31C1) represents 5 to 1 percent of the available drawdown in the respective wells. Both estimates conservatively assume no leakage or boundary condition and are a small percentage of the estimated 300 feet of total available drawdown in the Saddle Mountains Basalt Aquifer.

We conclude that although pumping interference effects are likely, no impairment of existing groundwater rights—either permit or permit-exempt—will occur in the Saddle Mountains Basalt Aquifer with full use of the requested quantity.

The proposed water right transfer will be water budget neutral with respect to TWSA as measured at the Prosser gage. In addition, no perennial surface water body is mapped within 5,000 feet of the



September 18, 2018

## MEMORANDUM

Project No.: 170289-002-02

applicant's property, and the closest surface water body listed by Washington State Department of Fish and Wildlife (WDFW) database to have Endangered Species Act (ESA)-listed species is the Yakima River, located about 6.8 miles south of the proposed well. Therefore, no impairment of local surface water or ESA-listed species will occur.

### References

- Department of Natural Resources, 2018, Geologic Information Portal, Washington Interactive Geologic Map. <http://www.dnr.wa.gov/programs-and-services/geology/publications-and-data/geologic-information-portal>.
- Driscoll, F.G., 1986, Groundwater and Wells, Johnson Division, St. Paul, Minnesota.
- Ely, D.M., Bachmann, M.P., and Vaccaro, J.J., 2011. Numerical simulation of groundwater flow for the Yakima River basin aquifer system, Washington: U.S. Geological Survey Scientific Investigations Report 2011-5155, 90 p.
- Jones, M.A., and Vaccaro, J.J., 2008, Extent and depth to top of basalt and interbed hydrogeologic units, Yakima River Basin aquifer system, Washington: U.S. Geological Survey Scientific Investigations Report 2008-5045, 22 p., 5 pls.
- Theis, C.V., 1935, The lowering of the piezometer surface and the rate and discharge of a well using ground-water storage, Transactions, American Geophysical Union, 16:519-24.
- Vaccaro, J.J., Jones, M.A., Ely, D.M., Keys, M.E., Olsen, T.D., Welch, W.B., and Cox, S.E., 2009, Hydrogeologic framework of the Yakima River basin aquifer system, Washington: U.S. Geological Survey Scientific Investigations Report 2009-5152, 106 p.
- Vaccaro, J.J., and Olsen, T.D., 2007, Estimates of ground-water recharge to the Yakima River Basin aquifer system, Washington, for predevelopment and current land-use and land-cover conditions: U.S. Geological Survey Scientific Investigations Report 2007-5007, 30 p.



September 18, 2018

## **MEMORANDUM**

Project No.: 170289-002-02

### **Limitations**

Work for this project was performed for the Lathrop, Winbauer, Harrel, Slothower & Denison L.L.P (Client) on behalf of Archie and Mari den Hoed, and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

### **Attachments**

- Figure 1 – Project Area Map
- Figure 2 – Surficial Geology Map
- Figure 3 – Cross Section A-A'
- Figure 4 – Cross Section B-B'
- Figure 5 – Ecology Monitoring Well Locations and Completion
- Figure 6 – Ecology Groundwater Trends (Fall)
- Figure 7 – Ecology Groundwater Trends (Spring)
- Figure 8 – Static Water Level at Time of Drilling
- Figure 9 - Ecology Groundwater Level Statistics
- Attachment 1 – Well Logs

V:\170289 Moeur Water Right Transfer\Deliverables\Den Hoed HG Memo\Den Hoed HG Memorandum\_Final\_20180919.docx



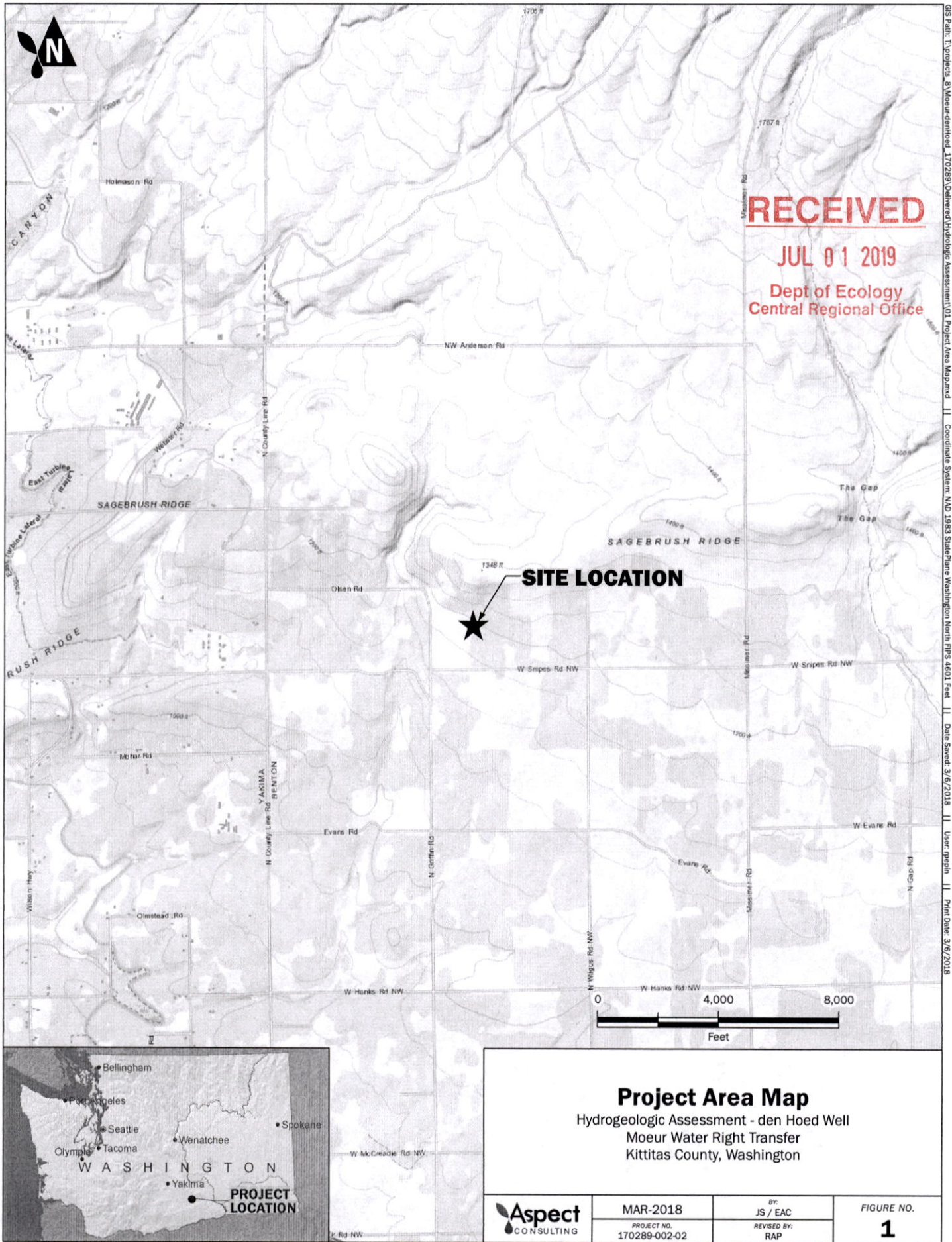
**RECEIVED**

JUL 01 2019

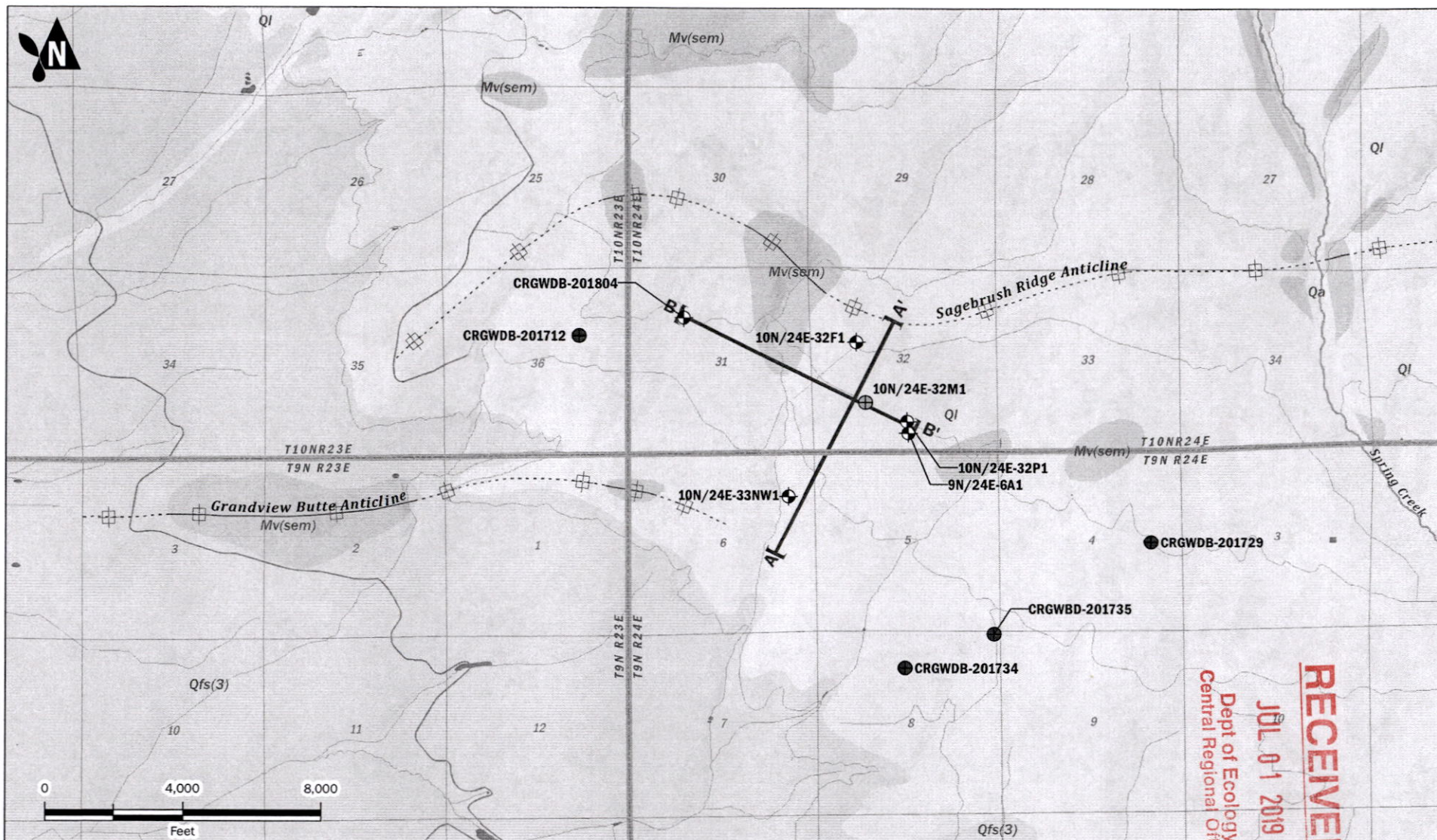
Dept of Ecology  
Central Regional Office

## **FIGURES**









- Cross-Section Well
- den Hoed Groundwater Level Well
- Ecology Groundwater Database Well
- Cross Section
- Township/Range
- Section

#### Surficial Geology (WADNR)

- Quaternary alluvium (Qa)
- Quaternary eolian deposits, loess (Ql)
- Pleistocene outburst flood deposits (Qfs(3))
- Miocene Columbia River Basalt Group, Saddle Mountains Basalt (Mv(sem))
- Anticline  
dashed where location concealed

### Surficial Geology Map

Hydrogeologic Assessment - den Hoed Well  
Moeur Water Right Transfer  
Kittitas County, Washington



MAR-2018

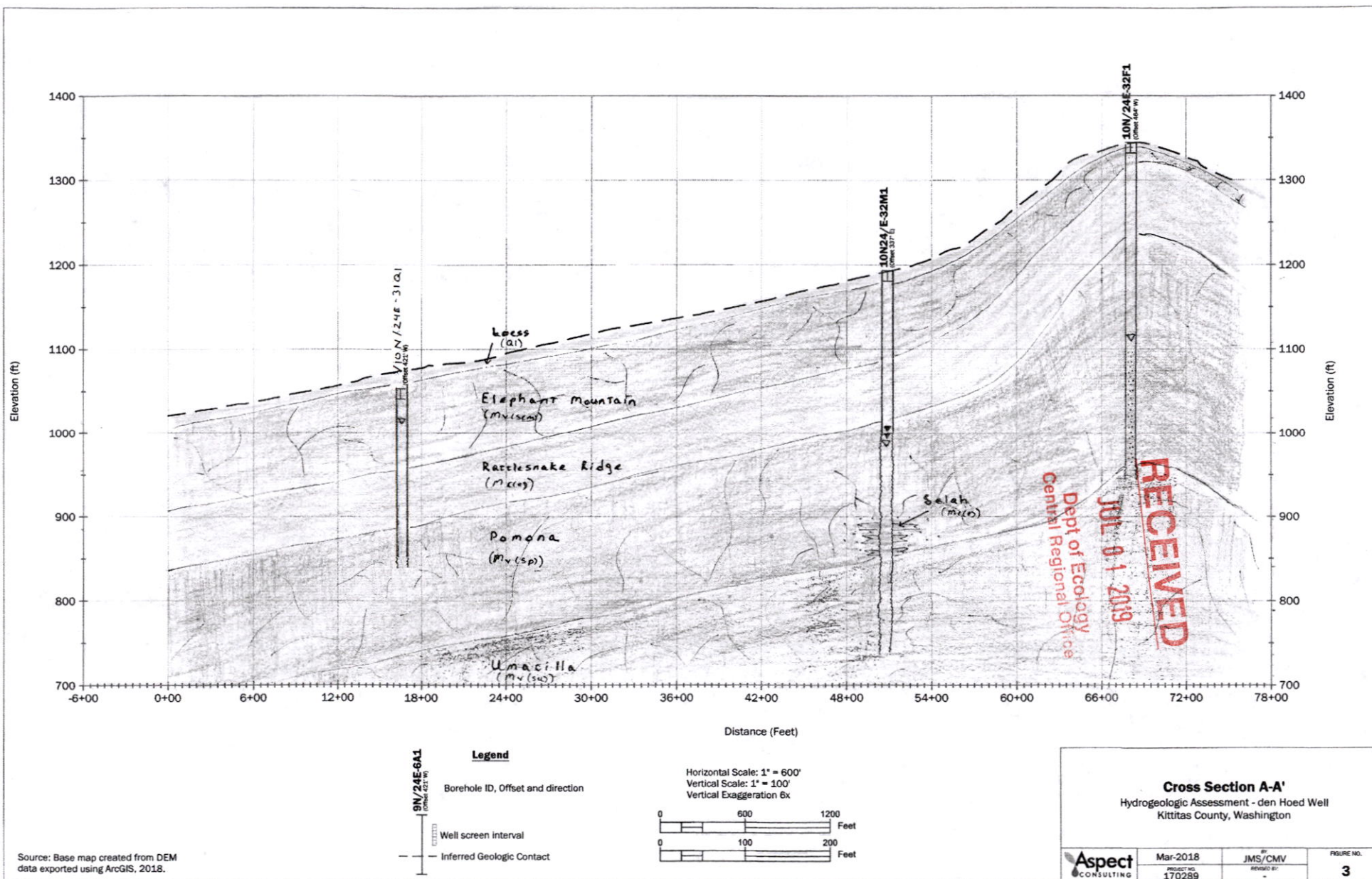
PROJECT NO.  
170289-002-02

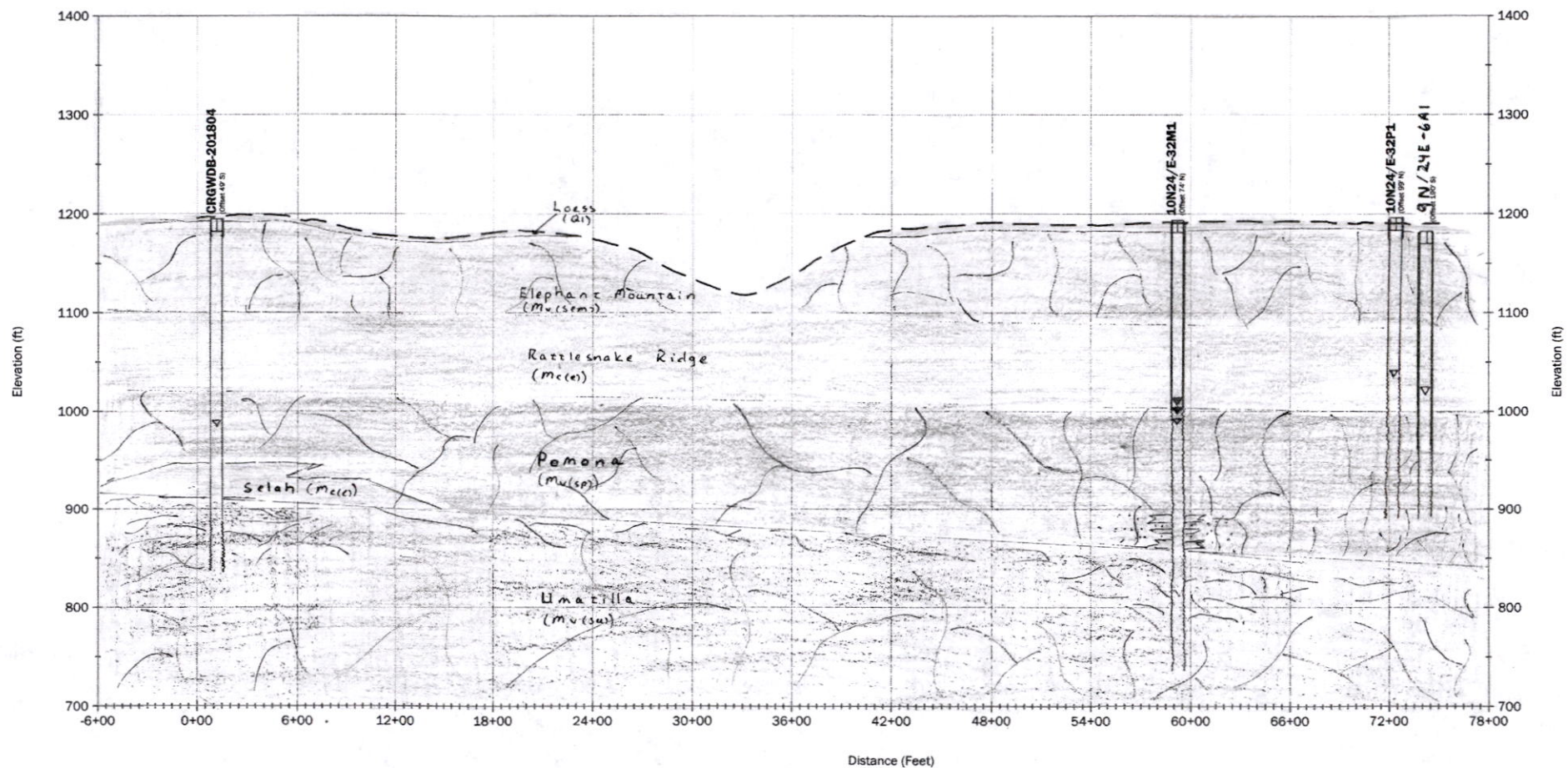
BY:  
JS / RAP  
REVISED BY:  
---

FIGURE NO.

2





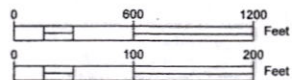


Distance (Feet)

#### Legend

- 10N24/E-32M1  
(Offset 74 ft N)
- Borehole ID, Offset and direction
  - Well screen interval
  - Inferred Geologic Contact

Horizontal Scale: 1" = 600'  
Vertical Scale: 1" = 100'  
Vertical Exaggeration 6x



Source: Base map created from DEM data exported using ArcGIS, 2018.

Dept of Ecology  
Central Regional Office

JUL 01 2019

RECEIVED

#### Cross Section B-B'

Hydrogeologic Assessment - den Hoed Well  
Kittitas County, Washington

Aspect  
CONSULTING

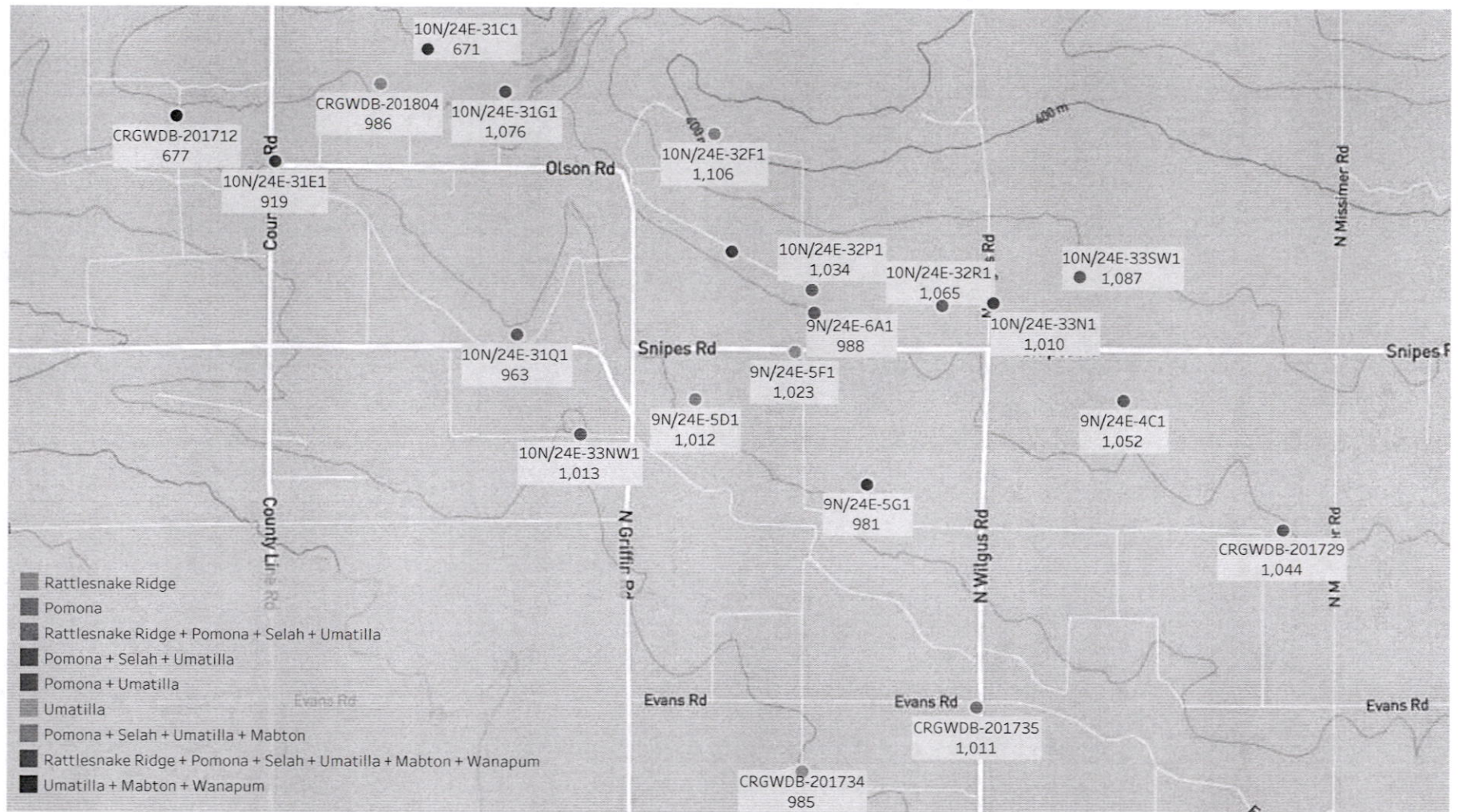
Mar-2018  
PROJECT NO.  
170289

by  
JMS/CMV  
REVISED BY

FIGURE NO.  
4



# Groundwater Elevation at Time of Drilling



**RECEIVED**  
JUL 01 2018  
Dept of Ecology  
Central Regional Office

## Well Location and Completion

Hydrogeologic Assessment - den Hoed Well Moer  
Water Right Transfer  
Kittitas County, Washington



MAR-2018

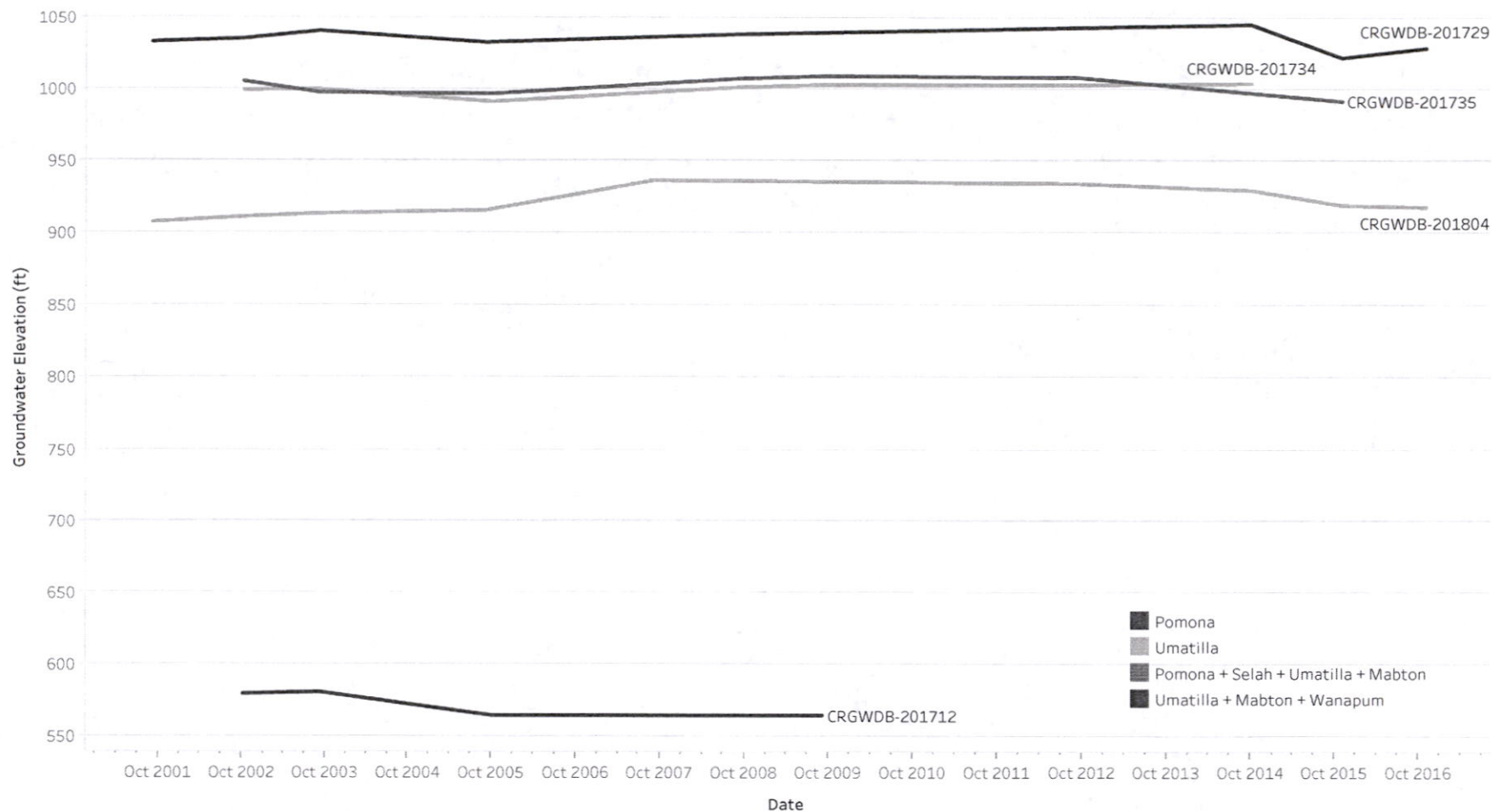
PROJECT NO.  
170289-002-02

BY:  
JS / RAP  
REVISED BY:  
---

FIGURE NO.

**5**

# Autumn Groundwater Elevations (WY2000 to WY2017)



## Autumn Groundwater Elevation Trends

Hydrogeologic Assessment - den Hoed Well  
Moeur Water Right Transfer  
Kittitas County, Washington



MAR-2018

PROJECT NO.  
170289-002-02

BY:  
JS / RAP  
REVISED BY:  
---

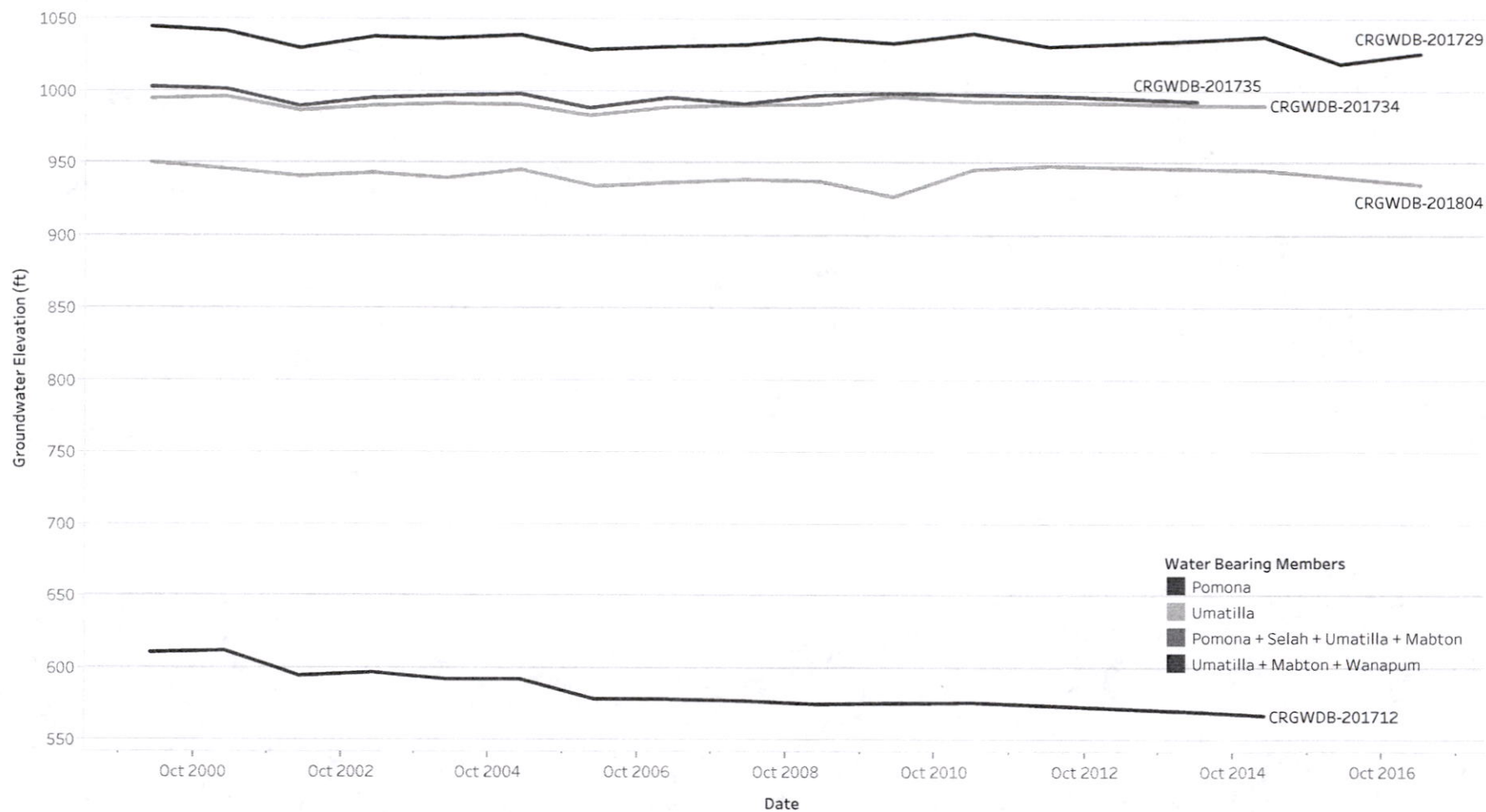
FIGURE NO.

6

**RECEIVED**  
JUL 01 2019  
Dept of Ecology  
Central Regional Office



# Spring Groundwater Elevations (WY2000 to WY2017)



## Spring Groundwater Elevation Trends

Hydrogeologic Assessment - den Hoed Well  
Moeur Water Right Transfer  
Kittitas County, Washington



MAR-2018

PROJECT NO.  
170289-002-02

BY:  
JS / RAP  
REVISED BY:  
---

FIGURE NO.

7

RECEIVED  
JUL 01 2019

**Groundwater Elevation (ft)**

**Water Bearing Members**

- Rattlesnake Ridge
- Pomona
- Pomona + Umatilla
- Pomona + Selah + Umatilla
- Rattlesnake Ridge + Pomona + Selah + Umatilla
- Umatilla
- Pomona + Selah + Umatilla + Mabton
- Rattlesnake Ridge + Pomona + Selah + Umatilla + Mabton + Wanapum
- Umatilla + Mabton + Wanapum

| Well ID       | Year | Groundwater Elevation (ft) |
|---------------|------|----------------------------|
| 10N/24E-32F1  | 1977 | 1105                       |
| 10N/24E-31G1  | 1977 | 1080                       |
| CRGWDB-201729 | 1977 | 1045                       |
| CRGWDB-201735 | 1977 | 1015                       |
| 9N/24E-5D1    | 1979 | 1015                       |
| CRGWDB-201734 | 1977 | 985                        |
| CRGWDB-201804 | 1977 | 980                        |
| 10N/24E-31Q1  | 1985 | 965                        |
| 9N/24E-6A1    | 1988 | 985                        |
| 9N/24E-5G1    | 1988 | 980                        |
| 9N/24E-5F1    | 1989 | 1030                       |
| 10N/24E-33SW1 | 1992 | 1090                       |
| 10N/24E-33NW1 | 1992 | 1015                       |
| 10N/24E-32P1  | 1994 | 1035                       |
| 10N/24E-32R1  | 1995 | 1065                       |
| 10N/24E-33N1  | 2005 | 1010                       |
| 10N/24E-31E1  | 2012 | 920                        |
| 9N/24E-4C1    | 2015 | 1050                       |
| 10N/24E-32M1  | 2017 | 1000                       |
| CRGWDB-201712 | 1977 | 680                        |
| 10N/24E-31C1  | 1979 | 675                        |

RECEIVED  
JUL 01 2019  
Dept of Ecology  
Central Regional Office

Hydrogeologic Assessment - den Hoed Well  
Moeur Water Right Transfer  
Kittitas County, Washington



PROJECT NO.  
170289-002-02

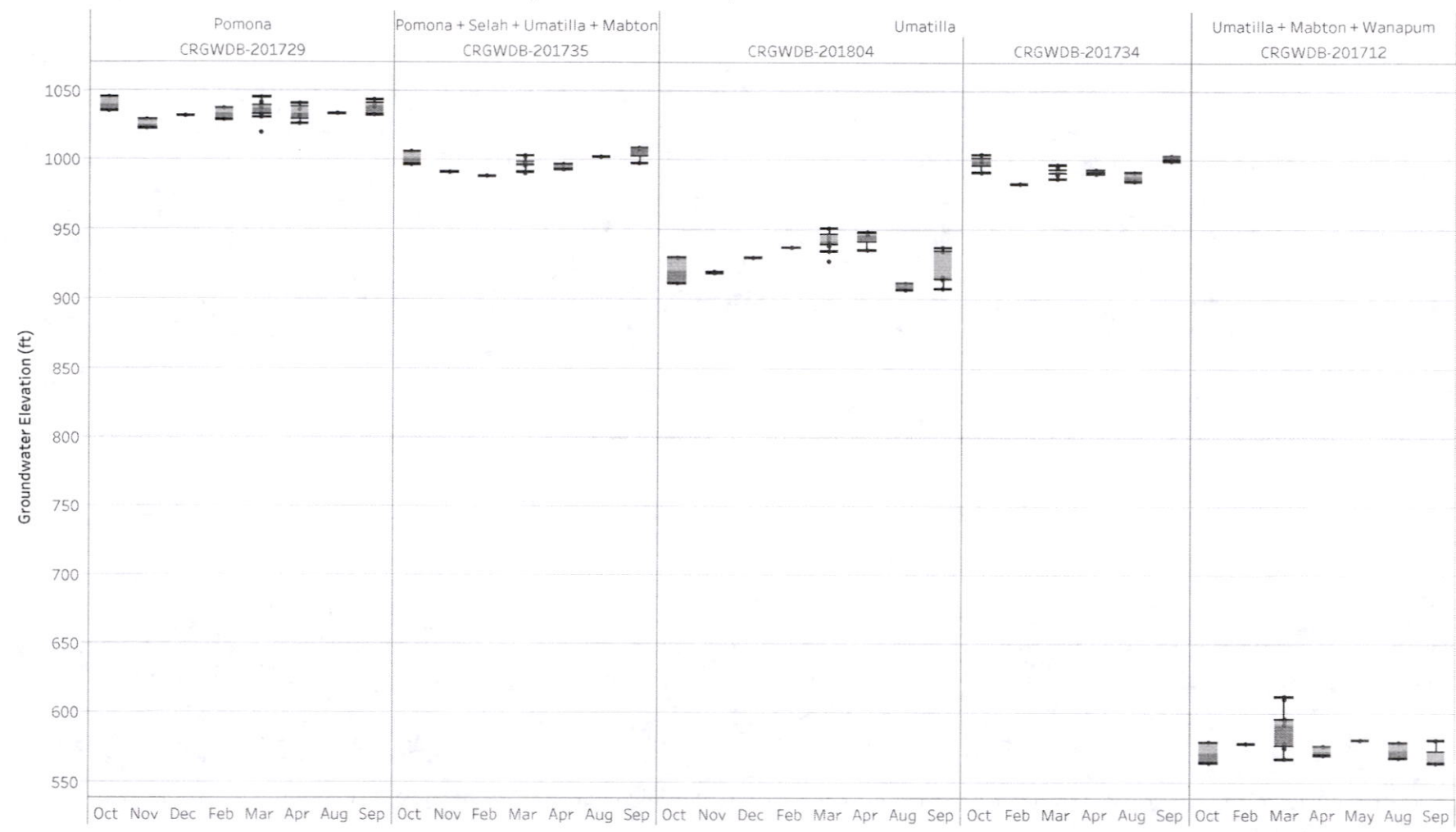
REVISÉ BY:

8



GIS Path: \\nwccsdc\GIS\MapDocuments\170289\Hydrogeologic\_Assessment\04\_Footprint\area\_statistics.mxd | Coordinate System: NAD 1983 | Aerial Satellite Imagery: 2000 | EPS: 4326 | Date Stamp: 3/14/2018 | User: rap | Print Date: 3/14/2018

# Monthly Groundwater Elevation Statistics (2000 to Present)



## Groundwater Elevation Statistics

Hydrogeologic Assessment - den Hoed Well  
Moeur Water Right Transfer  
Kittitas County, Washington



MAR-2018

PROJECT NO:  
170289-002-02

BY:  
JS / RAP  
REVISED BY:  
---

FIGURE NO.

9

Dept of Ecology  
Central Regional Office

JUL 01 2019

RECEIVED

**RECEIVED**

**JUL 01 2019**

**Dept of Ecology  
Central Regional Office**

## **ATTACHMENT 1**

### **Well Logs**



# WATER WELL REPORT

9N/24E-6A1

Application No.

STATE OF WASHINGTON No. 2

Permit No 54-29473 P

(1) OWNER: Name Andy DEN HOED Address Rt. 2, Box 2637, Grandview  
 (2) LOCATION OF WELL: County Benton County SE 1/4 SW 1/4 Sec 32 T. 10 N. R. 24 W.M.  
 bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐  
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one).....

|               |                                     |             |                                     |        |                          |
|---------------|-------------------------------------|-------------|-------------------------------------|--------|--------------------------|
| New well      | <input checked="" type="checkbox"/> | Method: Dug | <input type="checkbox"/>            | Bored  | <input type="checkbox"/> |
| Deepened      | <input type="checkbox"/>            | Cable       | <input type="checkbox"/>            | Driven | <input type="checkbox"/> |
| Reconditioned | <input type="checkbox"/>            | Rotary      | <input checked="" type="checkbox"/> | Jetted | <input type="checkbox"/> |

(5) DIMENSIONS: Diameter of well 12 inches.  
Drilled 290 ft. Depth of completed well 280 ft.

**(6) CONSTRUCTION DETAILS:**

Casing installed: \_\_\_\_\_ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Threaded ☐ \_\_\_\_\_ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Welded ☒ 12 " Diam. from + 1 ft. to 220 ft.

**Perforations:** Yes ☐ No ☒

Type of perforator used.....

SIZE of perforations ..... in. by ..... in.

..... perforations from ..... ft. to ..... ft.

..... perforations from ..... ft. to ..... ft.

..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☒

Manufacturer's Name.....

Type..... Model No.....

Diam..... Slot size..... from..... ft. to..... ft.

Diam..... Slot size..... from..... ft. to..... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☒ No ☐ To what depth? 220 ft.  
Material used in seal NEAT CEMENT  
Did any strata contain unusable water? Yes ☐ No ☐  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name. \_\_\_\_\_  
Type: \_\_\_\_\_ HP \_\_\_\_\_

(8) **WATER LEVELS:** Land-surface elevation above mean sea level..... ft.  
 Static level 165..... ft. below top of well Date.....  
 Artesian pressure..... lbs. per square inch Date.....  
 Artesian water is controlled by.....  
 (Cap, valve, etc.)

**(9) WELL TESTS:** Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? .....

| Yield: | gal./min. with | ft. drawdown after | hrs. |
|--------|----------------|--------------------|------|
| ..     | ..             | ..                 | ..   |
| ..     | ..             | ..                 | ..   |

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|------|-------------|------|-------------|------|-------------|
|      |             |      |             |      |             |
|      |             |      |             |      |             |
|      |             |      |             |      |             |
|      |             |      |             |      |             |
|      |             |      |             |      |             |

Date of test \_\_\_\_\_

Bailer test 800 gal/min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Artesian flow \_\_\_\_\_ g.p.m., Date \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☒

**(10) WELL LOG:**

**Formation:** Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL                           | FROM | TO  |
|------------------------------------|------|-----|
| Pint                               | 0    | 4   |
| MEDIUM BASALT                      | 4    | 90  |
| SANDSTONE (10 gpm)                 | 90   | 180 |
| MEDIUM Black BASALT                | 180  | 275 |
| Broken basalt GRAVEL<br>with water | 275  | 290 |

**RECEIVED**

JUL 01 2019

Dept of Ecology  
Central Regional Office

RECEIVED  
2291000

Work started Dec. 10, 1987. Completed Feb. 28, 1988

**WELL DRILLER'S STATEMENT:**

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

NAME Bach Drilling Co.  
(Person, firm, or corporation) (Type or print)

Address Rt. 5, Box 1010, Ellensburg

[Signed] Mike Bach  
(Well Driller)

License No. 22 Date 3-21-88 1988

(USE ADDITIONAL SHEETS IF NECESSARY)



File Original and First Copy with  
Department of Ecology  
Second Copy — Owner's Copy  
Third Copy — Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

9N/24E-5G1

Application No.

No. 1

Permit No.

64-29473P

(1) OWNER: Name Andy Dea Hoed

Address Rt. 2, Box 2637, Grandview

(2) LOCATION OF WELL: County Benton

SW 1/4 NE 1/4 Sec. 5 T. 9 N. R. 24 W.M.

ring and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐  
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_  
New well ☒ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 12 inches.  
Drilled 360 ft. Depth of completed well 360 ft.

## (6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from 0 ft. to 205 ft.  
Threaded ☐ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Welded ☐ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes ☐ No ☒

Type of perforator used \_\_\_\_\_  
SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No. \_\_\_\_\_  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☒ No ☐ To what depth? 205 ft.  
Material used in seal NEAT CEMENT  
Did any strata contain unusable water? Yes ☐ No ☐  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_  
Type: \_\_\_\_\_ HP \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation \_\_\_\_\_ ft.  
Static level 135 ft. below top of well Date \_\_\_\_\_  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☐ No ☐ If yes, by whom? \_\_\_\_\_  
Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

" " " " " "  
" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|------|-------------|------|-------------|------|-------------|
|      |             |      |             |      |             |
|      |             |      |             |      |             |
|      |             |      |             |      |             |

ate of test \_\_\_\_\_  
Pump test: 800 gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☐

## (10) WELL LOG:

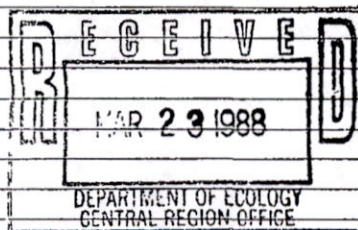
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL                    | FROM | TO  |
|-----------------------------|------|-----|
| Dirt                        | 0    | 4   |
| MEDIUM BASALT               | 4    | 100 |
| SANDSTONE                   | 100  | 185 |
| MEDIUM BASALT               | 185  | 312 |
| Fractured BASALT with water | 312  | 355 |
| HARD BASALT                 | 355  | 360 |

RECEIVED

JUL 01 2019

Dept of Ecology  
Central Regional Office



Work started FEB. 28, 1988. Completed MAR 21, 1988.

## WELL DRILLER'S STATEMENT:

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

NAME Bash Drilling Co. ENTERED  
(Person, firm, or corporation) (Type or print)

Address Rt. 5, Box 1010, Ellensburg

[Signed] Mike Bash  
(Well Driller)

License No. 22 Date MAR 21, 1988



File Original and First Copy with  
Department of Ecology  
Second Copy—Owner's Copy  
Third Copy—Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

7890

Start Card No 084415

10N/24E-33SW1

Water Right Permit No

N

(1) OWNER: Name Audy DENHOED

Address Grandview

LOCATION OF WELL: County BENTON

S 45W & Sec 33 T 10 N. R 24 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address)

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐  
☐ Irrigation ☐ Test Well ☐ Other ☐  
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)  
Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.  
Drilled 287 feet. Depth of completed well 289 ft.

## (6) CONSTRUCTION DETAILS:

Casing installed: 8 " Diam from +1 ft. to 20 ft.  
Welded ☐ 6 " Diam from +1 ft. to 270 ft.  
Liner installed ☒ Threaded ☐ Diam from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes ☒ No ☐  
Type of perforator used SAW-cut  
SIZE of perforations 18 in by 2 in.  
50 perforations from 250 ft. to 270 ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes ☐ No ☒  
Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No \_\_\_\_\_  
Diam \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.  
Material used in seal BENONITE - CEMENT  
Did any strata contain unusable water? Yes ☐ No ☐  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ H.P. \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.  
Static level 160 ft. below top of well Date \_\_\_\_\_  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☐ No ☐ If yes, by whom? \_\_\_\_\_  
Yield \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|------|-------------|------|-------------|------|-------------|
|      |             |      |             |      |             |

Date of test \_\_\_\_\_

Boiler test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Artest 50 gal./min. with stem set at 280 ft. for 1 hrs

Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☐

## (10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

| MATERIAL    | FROM | TO  |
|-------------|------|-----|
| Diat        | 0    | 5   |
| MED. BASALT | 5    | 90  |
| SANDSTONE   | 90   | 170 |
| MED. BASALT | 170  | 270 |
| SOFT BASALT | 270  | 289 |

RECEIVED

JUL 01 2019

Dept. of Ecology  
Central Regional Office

SEP 29 1992

Work started 7-14 19 7-17 Completed 7-17 1992

## WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

NAME BACH DRILLING Co.  
(PERSON FIRM OR CORPORATION) (TYPE OR PRINT)

Address RT5 Box 1010 ELLENBURG

(Signed) Mike Bach License No. 22  
(WELL DRILLER)

Contractor's  
Registration  
No. WUCRBC133N4 Date 7-17 1992

(USE ADDITIONAL SHEETS IF NECESSARY)







# WATER WELL REPORT

Original & 1<sup>st</sup> copy - Ecology, 2<sup>nd</sup> copy - owner, 3<sup>rd</sup> copy - driller

Construction/Decommission ("x" in circle)

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION Notice*

of Intent Number 176670

PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal  
☐ DeWater ☒ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one)

☒ New well ☐ Reconditioned Method: ☐ Dug ☐ Bored ☐ Driven  
☒ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 16" inches, drilled 460' ft.  
 Depth of completed well 460' ft.

## CONSTRUCTION DETAILS

Casing ☒ Welded 24" Diam from +1 ft. to 20' ft.  
 Installed: ☒ Liner installed 16" Diam from +1 ft. to 193' ft.  
☐ Threaded Diam from ft. to ft.

Perforations: ☐ Yes ☒ No

Type of perforator used

SIZE of perfs in by in. and no. of perfs from ft to ft

Screens: ☐ Yes ☒ No ☐ K-Pac Location

Manufacturer's Name

Type Model No.  
 Diam. Slot size from ft. to ft.  
 Diam. Slot size from ft. to ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand ft. to ft.  
 Materials placed from ft. to ft.

Surface Seal: ☒ Yes ☐ No To what depth? 193' ft.

Material used in seal cement

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water Depth of strata

Method of sealing strata off

PUMP: Manufacturer's Name

Type HP

WATER LEVELS: Land-surface elevation above mean sea level ft.

Static level 208' ft. below top of well Date

Artesian pressure lbs. per square inch Date

Artesian water is controlled by (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom

Yield: gal./min. with ft. drawdown after hrs.

Yield: gal./min. with ft. drawdown after hrs.

Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date of test

Bailer test gal./min. with ft. drawdown after hrs.

Airtest 1200 gal./min. with stem set at 400 ft. for 1 hrs.

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

## CURRENT

Notice of Intent No. AHP775

Unique Ecology Well ID Tag No. W150757

Water Right Permit No. G4-34963

Property Owner Name Archie DenHoed

Well Street Address 62801 N. Griffin Rd.

City Grandview County BENTON

Location NW1/4-1/4 SW1/4 Sec 32 Twn 10N R 24 EWM or WWM ☒ circle ☐ one

Lat/Long (s, t, r) Lat Deg Lat Min/Sec

Still REQUIRED) Long Deg Long Min/Sec

Tax Parcel No.

## CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

| MATERIAL                                          | FROM | TO  |
|---------------------------------------------------|------|-----|
| Brown Silty Soil                                  | 0    | 5   |
| Caliche & Broken rock                             | 5    | 15  |
| Med. hard gray & brown basalt                     | 15   | 44  |
| Med. soft brown & gray basalt                     | 44   | 56  |
| Hard gray basalt                                  | 56   | 65  |
| Med. hard gray & brown basalt                     | 65   | 106 |
| Soft brown clay                                   | 106  | 144 |
| Brown Sandstone                                   | 144  | 176 |
| Soft broken brown basalt                          | 176  | 193 |
| Hard gray basalt                                  | 193  | 207 |
| Soft reddish brown visicular basalt some tan      |      |     |
| claystone Little water 30gpm                      | 207  | 218 |
| Med. hard gray & brown basalt                     | 218  | 236 |
| Hard gray basalt                                  | 236  | 298 |
| Soft broken brown basalt Some visicular with      |      |     |
| Brown clay Water 400                              | 298  | 337 |
| Med. hard brown & gray basalt                     | 337  | 342 |
| Med. soft dark gray porous basalt some green clay | 342  | 353 |
| Med. hard dark gray basalt 600 water              | 353  | 381 |
| Fractured dark gray basalt                        | 381  | 384 |
| Med. hard fractured gray basalt                   | 384  | 405 |
| Hard gray basalt 110 psi Rig air only             | 405  | 460 |

16" pipe to 193'

15" & 14 7/8 to 456'

RECEIVED

JUL 01 2015

Dept of Ecology

Regional Office

Start Date 5-24-05

Completed Date 6-6-05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☐ Trainee Name (Print) Larry McLanahan

Driller/Engineer/Trainee Signature *Larry McLanahan*

Driller or trainee License No. 0337

Drilling Company BJ Exploration Co., Inc.

Address 404 N. Conway Street

City, State, Zip Kennewick, WA 99336

Contractor's

Registration No. BJENPC1132QK

Date 6-23-05

Ecology is an Equal Opportunity Employer

If TRAINEE,  
 Driller's License No.  
 Driller's Signature



First Copy with  
Department of Ecology  
Second Copy - Owner's Copy  
Third Copy - Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

10N/24E-31Q1

Application No

Permit No

1) OWNER: Name CHATEAU STE. MICHELLE Address P.O. Box 1976, Woodinville, WA 98072

(2) LOCATION OF WELL: County YAKIMA - SW 1/4 SE 1/4 Sec 31 T10 N R24E W.M

Location and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐  
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)           
New well ☒ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.  
Drilled 250 ft Depth of completed well 250 ft.

## (6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from +1 ft. to 19 ft.  
Threaded ☐ " Diam. from          ft. to          ft.  
Welded ☒ " Diam. from          ft. to          ft.

Perforations: Yes ☐ No ☒  
Type of perforator used           
SIZE of perforations          in. by          in.  
perforations from          ft. to          ft.  
perforations from          ft. to          ft.  
perforations from          ft. to          ft.

Screens: Yes ☐ No ☒  
Manufacturer's Name           
Type          Model No.           
Diam          Slot size          from          ft. to          ft.  
Diam          Slot size          from          ft. to          ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:           
Gravel placed from          ft. to          ft.

Surface seal: Yes ☒ No ☐ To what depth? 19 ft.  
Material used in seal bentonite  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water?          Depth of strata           
Method of sealing strata off         

(7) PUMP: Manufacturer's Name           
Type:          H.P.         

(8) WATER LEVELS: Land-surface elevation          ft.  
above mean sea level  
Static level 150 ft below top of well Date 5/14/85  
Artesian pressure          lbs per square inch Date           
Artesian water is controlled by          (Cap, valve, etc)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☐ No ☒ If yes, by whom?           
Yield: 7 gal./min. with          ft. drawdown after          hrs.  
         ESTIMATED AIRLIFT           
         " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|------|-------------|------|-------------|------|-------------|
|      |             |      |             |      |             |
|      |             |      |             |      |             |

Date of test         

Bailer test          gal./min. with          ft. drawdown after          hrs.

Artesian flow          g.p.m. Date         

Temperature of water          Was a chemical analysis made? Yes ☐ No ☐

## (10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL                         | FROM | TO  |
|----------------------------------|------|-----|
| Overburden                       | 0    | 7   |
| Basalt, soft                     | 7    | 45  |
| Basalt, medium                   | 45   | 105 |
| Clay, brown                      | 105  | 125 |
| Clay, gray w/sand                | 125  | 185 |
| Sand w/water (25 GPM)            | 185  | 190 |
| Basalt, fractured                | 190  | 198 |
| Basalt, medium                   | 198  | 238 |
| Basalt, fractured w/water (7GPM) | 238  | 245 |
| Basalt, medium, black            | 245  | 250 |

240' PVC Liner Installed

6" Drive shoe installed

Packer set at 210'

PVC LINER PERFORATED with skill saw  
Size of perforations 1/16 x 5 inch  
100 perforations from 210 to 250

Work started 5/10 1985 Completed 5/14 1985

## WELL DRILLER'S STATEMENT:

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

NAME PONDEROSA DRILLING & DEVELOPMENT INC.  
(Person, firm, or corporation) (Type or print)

Address E. 6010 Broadway, Spokane, WA 99212

[Signed] James M. Doyle  
James M. Doyle (Well Driller)

License No. 1287 Date 5/14/ 19 85



1



File Original and First Copy with  
Department of Ecology  
Second Copy - Owner's Copy  
Third Copy - Driller's Copy

# WATER WELL REPORT STATE OF WASHINGTON

Application No.

Permit No. 9.4-23965

(1) OWNER: Name Dave Thompson Address \_\_\_\_\_

(2) LOCATION OF WELL: County NE NM Sec. 31 T. 10 N. R. 24 W.M.

Bearing and distance from section or subdivision corner:

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐  
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_  
New well ☐ Method: Dug ☐ Bored ☐  
Deepened ☒ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 10 inches.  
Drilled 43.5 ft Depth of completed well: 8.35 ft.

## (6) CONSTRUCTION DETAILS:

Casing installed: 10 " Diam. from 4 ft. to 600 ft.  
Threaded ☐ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Welded ☒ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes ☐ No ☒  
Type of perforator used \_\_\_\_\_  
SIZE of perforations \_\_\_\_\_ in by \_\_\_\_\_ in.  
perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes ☐ No ☒  
Manufacturer's Name \_\_\_\_\_ Model No. \_\_\_\_\_  
Type \_\_\_\_\_  
Diam. Slot size from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam. Slot size from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☐ No ☐ To what depth? \_\_\_\_\_ ft.  
Material used in seal \_\_\_\_\_  
Did any strata contain unusable water? Yes ☐ No ☐  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_  
Type: \_\_\_\_\_ H.P. \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation \_\_\_\_\_ ft.  
Static level 570 ft. below top of well Date 11-28-17  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☒ No ☐ If yes, by whom? \_\_\_\_\_  
Yield: \_\_\_\_\_ gal/min with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
The increasing water at 300 ft. set  
the test at 300 ft. was not  
Recovery time (time from pump turned off to water level measured from well top to water level) \_\_\_\_\_  
Time Water Level Time Water Level  
11-28-17  
Date of test: 11-28-17  
Packer test ABC gal/min with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Artesian flow: \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☒

## (10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL                   | FROM | TO  |
|----------------------------|------|-----|
| Grey Boulders / Hard       | 450  | 550 |
| Black Green Clay hard      | 550  | 570 |
| Black Basalt nod hard      | 570  | 715 |
| Basalt nod hard some water | 715  | 835 |
| Black Basalt nod with 215  | 835  | 835 |

RECEIVED

MAY 14 1980

RECEIVED

JUL 01 2019

Dept of Ecology  
Central Regional Office

Work started: \_\_\_\_\_ 19\_\_\_\_ Completed: \_\_\_\_\_ 19\_\_\_\_

## WELL DRILLER'S STATEMENT:

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

NAME Dave Thompson Drilling  
(Person, firm, or corporation) (Type or print)

Address 87 1/2 Ave 2002 3rd St NW

(Signed) Dave Thompson Jr.  
(Well Driller)

License No. 1335 Date 11-28, 1917

(USE ADDITIONAL SHEETS IF NECESSARY)







File Original and First Copy with  
Department of Ecology  
Second Copy—Owner's Copy  
Third Copy—Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

7727 10N/24E-33NW1

Start Card No. 084422

Water Right Permit No. 61-27713

(1) OWNER: Name DENHOF FARM Address \_\_\_\_\_

LOCATION OF WELL: County BENTON

W NW 33 T. 10 N. R. 24 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) \_\_\_\_\_

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐  
☒ Irrigation ☐ Test Well ☐ Other ☐  
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 12 inches.  
Drilled 215 feet. Depth of completed well \_\_\_\_\_ ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12 " Diam. from 0 ft. to 197 ft.  
Welded ☒ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Liner installed ☐ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Threaded ☐ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes ☐ No ☒

Type of perforator used \_\_\_\_\_

SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.

\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name \_\_\_\_\_

Type \_\_\_\_\_ Model No. \_\_\_\_\_

Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel \_\_\_\_\_

Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☒ No ☐ To what depth? 197 ft.

Material used in seal CEMENT

Did any strata contain unusable water? Yes ☐ No ☐

Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_

Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_

Type: \_\_\_\_\_ H.P. \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.

Static level 40 ft. below top of well Date \_\_\_\_\_

Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_

Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes ☐ No ☐ If yes, by whom? \_\_\_\_\_

Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

" " " " "

" " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time Water Level Time Water Level Time Water Level

Date of test \_\_\_\_\_

Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Airtest 700 gal./min. with stem set at \_\_\_\_\_ ft. for \_\_\_\_\_ hrs.

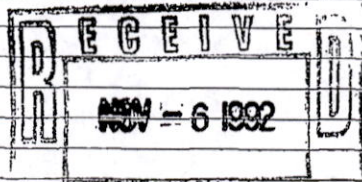
Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

| MATERIAL              | FROM | TO  |
|-----------------------|------|-----|
| Dirt                  | 0    | 7   |
| MED. BASALT           | 7    | 95  |
| SOFT BASALT-SANDSTONE | 95   | 170 |
| MED. BASALT           | 170  | 205 |
| SOFT BROKEN BASALT    | 205  | 215 |



DEPARTMENT OF ECOLOGY  
CENTRAL REGION OFFICE

RECEIVED

JUL 01 2019

Dept of Ecology  
Central Regional Office

Work started 9-22, 19. Completed 9-27, 1992

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Bach Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address Rts. Box 1010 ELLENSBURG, WA.

(Signed) Mike Bach License No 22  
(WELL DRILLER)

Contractor's Registration No. MIKEBAC 133N4 Date 11-1, 1992

(USE ADDITIONAL SHEETS IF NECESSARY)



10N/24E-33N1



# WATER WELL REPORT

Original & 1<sup>st</sup> copy - Ecology, 2<sup>nd</sup> copy - owner, 3<sup>rd</sup> copy - driller

Construction/Decommission ("x" in circle)

☐ Construction☒ Decommission ORIGINAL INSTALLATION Notice of Intent Number 179245

## CURRENT

Notice of Intent No. W150759

Unique Ecology Well ID Tag No. AHP774

Water Right Permit No. CG4-31301C

Property Owner Name Desert Hills Vineyard (Andy Denhoed)

Well Street Address 61603 N. Wilgus Rd.

City Grandview

County Benton

Location SW1/4-1/4 SW1/4 Sec 33 Twn 10N R 24 EWN or WWM ☒ circle one

Lat/Long (s, t, r)

Lat Deg

Lat Min/Sec

Still REQUIRED)

Long Deg

Long Min/Sec

Tax Parcel No.

## CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

| MATERIAL                                              | FROM | TO  |
|-------------------------------------------------------|------|-----|
| Soft brown silt                                       | 0    | 12  |
| Med. hard brown & gray basalt                         | 12   | 33  |
| Reddish brown basalt soft                             | 33   | 37  |
| Med. hard gray & brown basalt                         | 37   | 53  |
| Hard gray basalt                                      | 53   | 75  |
| Soft Brown Sandstone                                  | 75   | 154 |
| Med. soft reddish brown & black basalt                |      |     |
| Trace of Tan Clay                                     | 154  | 160 |
| Med. hard gray basalt                                 | 160  | 173 |
| Hard gray basalt                                      | 173  | 258 |
| Broken Brown & gray visicular basalt some tan         |      |     |
| claystone                                             | 258  | 262 |
| Med. hard gray basalt                                 | 262  | 268 |
| Broken brown & gray basalt some visicular Trace of    |      |     |
| tan claystone water 5 gpm                             | 268  | 273 |
| Hard gray basalt                                      | 273  | 285 |
| Med. soft broken brown & gray basalt some brown       |      |     |
| clay Water 200gpm                                     | 285  | 305 |
| Med. hard gray basalt some porous with green clay     | 305  | 330 |
| Hard light gray basalt                                | 330  | 366 |
| Med soft dark gray porous basalt with some green      |      |     |
| claystone little reddish brown basalt                 | 366  | 373 |
| Med. hard dark gray basalt                            | 373  | 390 |
| Soft reddish brown basalt                             | 390  | 395 |
| Med. hard brown & gray basalt                         | 395  | 423 |
| Hard dark gray basalt                                 | 423  | 457 |
| Med. soft porous dark gray basalt Trace of hard green |      |     |
| clay water                                            | 457  | 462 |
| Med. hard dark gray basalt                            | 462  | 468 |
| Reddish brown basalt med. soft                        | 468  | 472 |
| Porous basalt, trace of hard green clay               | 472  | 475 |

Start Date 6-24-05

Completed Date 7-6-05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☐ Trainee Name (Print) Larry McLanahanDriller/Engineer/Trainee Signature *[Signature]*

Driller or trainee License No. 0337

Drilling Company BJ Exploration Co., Inc.

Address 404 North Conway Street

City, State, Zip Kennewick, WA 99336

Contractor's

Registration No. BJENPCI132QK

Date 7-29-05

Ecology is an Equal Opportunity Employer.

If TRAINEE,

Driller's Licensed No.

Driller's Signature

ECY 050-1-20 (Rev 3/05)

The Department of Ecology does NOT warranty the Data and/or Information on this Well Report.

RECEIVED

JUL 01 2019

Dept of Ecology  
Central Regional Office







File Original and First Copy with  
Department of Ecology  
Second Copy — Owner's Copy  
Third Copy — Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

Water Right Permit No.

10N/24E-32R1

Start Card No. WY8307UNIQUE WELL I.D. # ABX444

(1) OWNER: Name Ed Henschfeld Address Rt 2 Box 2632 Grandview WA  
LOCATION OF WELL: County Benton SE 1/4 SE 1/4 Sec 32 T. 10 N., R. 24E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) State 95 N. 3012

(3) PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐  
☐ Irrigation ☐ Test Well ☐ Other ☐  
☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)  
Abandoned ☐ New well ☐ Method: Dug ☐ Bored ☐  
Deepened ☒ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 10 inches.  
Drilled 290 feet. Depth of completed well 290 ft.

## (6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from unknown to 6 ft.  
Welded ☐ " Diam. from 6 ft. to 6 ft.  
Liner installed ☐ " Diam. from 6 ft. to 6 ft.  
Threaded ☐ " Diam. from 6 ft. to 6 ft.

Perforations: Yes ☐ No ☒  
Type of perforator used \_\_\_\_\_  
SIZE of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes ☐ No ☒  
Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No. \_\_\_\_\_  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☒ No ☐ To what depth? \_\_\_\_\_ ft.  
Material used in seal \_\_\_\_\_  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_  
Type: \_\_\_\_\_ H.P. \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.  
Static level 145' ft. below top of well Date 5-19-95  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☐ No ☐ If yes, by whom? \_\_\_\_\_  
Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

" " " "  
" " " "  
" " " "  
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)  
Time Water Level Time Water Level Time Water Level

Date of test \_\_\_\_\_  
Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Airtest 145' gal./min. with stem set at 290 ft. for 1 hrs.  
Artesian flow 145' g.p.m. Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☒

## (10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

| MATERIAL                      | FROM | TO  |
|-------------------------------|------|-----|
| Open Hole                     | 0    | 200 |
| Black Basalt                  | 200  | 278 |
| Broken Basalt (water bearing) | 278  | 290 |

10N/24E-32R1  
10N/24E-32R1

ABX 211 1995

RECEIVED

JUL 01 2019

Dept of Ecology  
Central Regional Office

Work Started 4-8, 1995 Completed 4-11, 1995

## WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Crowe Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address Rt 1 Box 1006 Prosser WA

(Signed) Tim Crowe License No. 2235 (WELL DRILLER)

Contractor's Registration No. WDO 995T Date 5-11, 1995

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.





CRGWDB-201804

File Original and First Copy with  
Department of Ecology  
Second Copy - County Copy  
Third Copy - Driller Copy

# WATER WELL REPORT STATE OF WASHINGTON

Application No. **64-24765**  
Permit No. \_\_\_\_\_

(1) OWNER: Name **James McPherson** Address **RT2-Box 220 Grosview**  
(2) LOCATION OF WELL: County **Benton** Section **SE 14 NW 31 T. 10 N R. 24 W**  
Bearing and distance from section or subdivision corner **1000 ft from SE corner**

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐  
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) **2**  
New well ☒ Bored ☐ Drilled ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well **12** inches  
Drilled **759** ft Depth of completed well **854** ft

## (6) CONSTRUCTION DETAILS:

Casing installed **10"** Diam from **0** ft to **304** ft  
Threaded ☐ Diam from **0** ft to **0** ft  
Welded ☒ Diam from **0** ft to **0** ft

Perforations: Yes ☐ No ☒  
Type of perforator used \_\_\_\_\_  
SIZE of perforations \_\_\_\_\_ in by \_\_\_\_\_ in  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft to \_\_\_\_\_ ft  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft to \_\_\_\_\_ ft  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft to \_\_\_\_\_ ft

Screens: Yes ☐ No ☒  
Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No \_\_\_\_\_  
Diam \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft to \_\_\_\_\_ ft  
Diam \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft to \_\_\_\_\_ ft

Gravel packed Yes ☐ No ☒ Size of gravel \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft to \_\_\_\_\_ ft

Surface seal: Yes ☒ No ☐ To what depth? **25** ft  
Material used in seal **Neat Cement**  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name \_\_\_\_\_  
Type: \_\_\_\_\_ HP \_\_\_\_\_

(8) WATER LEVELS: Land-surface elevation \_\_\_\_\_ ft  
Static level **7.11** ft below top of well Date \_\_\_\_\_  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap, valve etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☒ No ☐ If yes, by whom? **Pat Moore**  
Yield: **912** gal/min with **0** ft drawdown after **8** hrs

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)  
Time Water Level Time Water Level Time Water Level  
\_\_\_\_\_  
Date of test \_\_\_\_\_  
Packer test \_\_\_\_\_ gal/min with \_\_\_\_\_ ft drawdown after \_\_\_\_\_ hrs  
Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
Temperature of water **67** Was a chemical analysis made? Yes ☐ No ☒

S. 8 No. 7356-05-(Rev. 4/71)  
1CV-070-28

(USE ADDITIONAL SHEETS IF NECESSARY)

## (10) WELL LOG

Formation: Describe by color, character, size of material and structure and show thickness of aquifers and the kind and nature of the material in each stratum penetrated with at least one entry for each change of formation.

| MATERIAL               | FROM | TO  |
|------------------------|------|-----|
| TOP SOIL               | 0    | 4   |
| Basalt Black hard      | 4    | 49  |
| Basalt Brown           | 49   | 56  |
| 10 GPM at 85-56        |      |     |
| Basalt Black V. hard   | 56   | 89  |
| Basalt Brown           | 89   | 175 |
| 50-60 GPM 165-175      |      |     |
| Basalt Brown Black     | 175  | 250 |
| Clay Gray              | 250  | 275 |
| Basalt Brown Brown     | 275  | 285 |
| Basalt Gray Very hard  | 285  | 310 |
| Basalt Black Beaten    |      |     |
| with big Basalt Gravel |      |     |
| Gravel 75 ft - up 310  | 310  | 354 |
| 2000 GPM at 310        |      |     |

RECEIVED  
SEP 14 1977

DEPARTMENT OF ECOLOGY  
CLERK REG. MAIL OFFICE

Work started **6-1-77** Completed **8-15-77**

## WELL DRILLER'S STATEMENT

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

NAME **Stevens Drilling Co** (Person, firm, or corporation) (Type or print)

Address **701 50 45th W. Richland Wash**

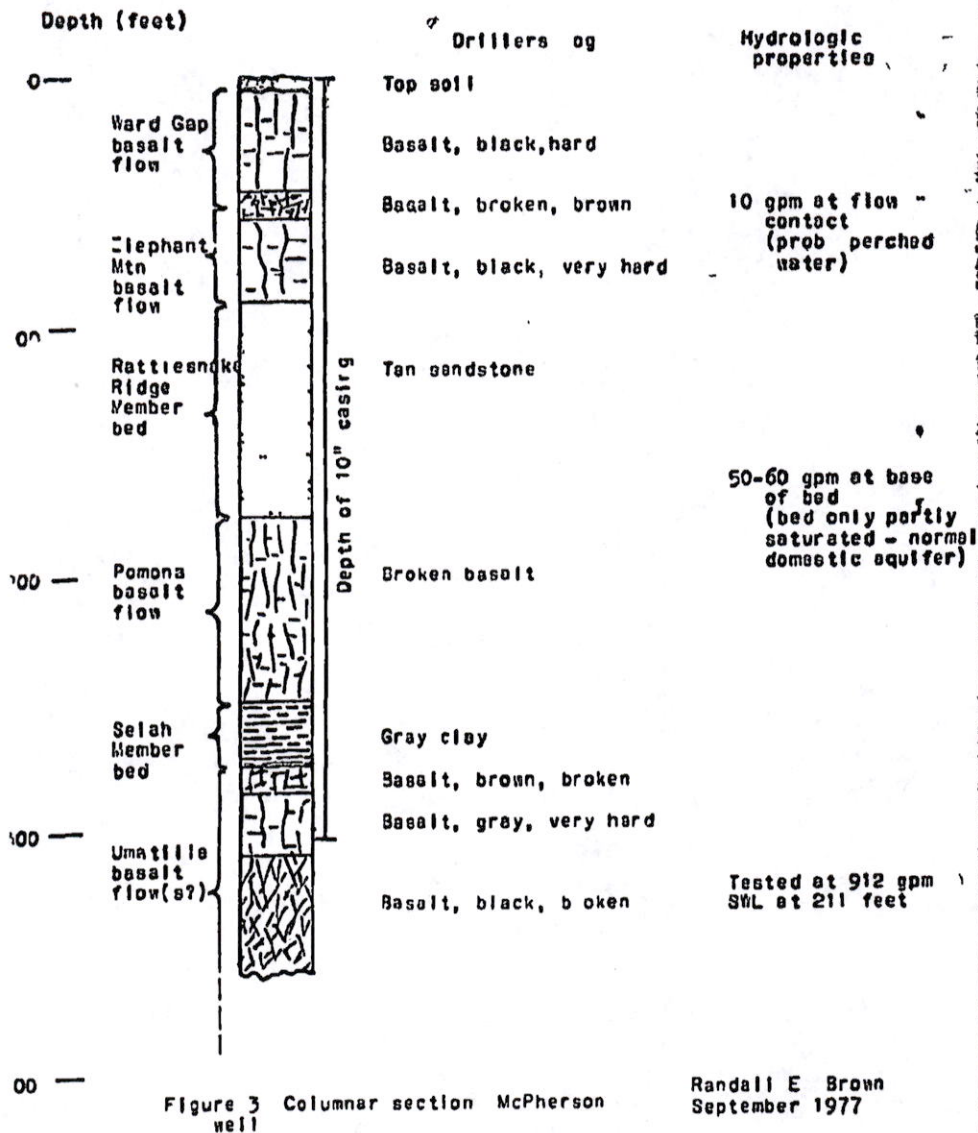
(Signed) **John S. H. Stevens** (Well Driller)

License No. **0482** Date \_\_\_\_\_ 19\_\_\_\_

RECEIVED

JUL 01 2019

Dept of Ecology  
Central Regional Office



RECEIVED

JUL 01 2019

Dept of Ec  
Central B...



Name & Place James McPherson  
 Test Number 1 Driller St George  
 Rig Foreman Mike Ward  
 Pump Setting 285 + Borels

**FARMORE PUMP & IRRIGATION**  
**WELL TEST LOG**

Box 1307 Airport Road  
 PENDLETON OREGON 97001  
 Phone 503 270-4107

Well Size 12"

Static Level 210'

Air Line 285' Well Depth 350'

DATE 8-15-77

RECEIVED

SEP 14 1977

DEPARTMENT OF ECOLOGY  
 CENTRAL REGIONAL OFFICE

| START TIME | RPM CHECK | GPM READING | AIRLINE READING | ORFICE READING | DROPPED | BOWL SIZE | COLUMN SIZE | PUMP INSTALLED            |       | WATER TEMP. |
|------------|-----------|-------------|-----------------|----------------|---------|-----------|-------------|---------------------------|-------|-------------|
|            |           |             |                 |                |         |           |             | SERIAL                    | MODEL |             |
| 4:00       | 1500      | 465         | 320 211'        | 14"            |         | 8         | 6           |                           |       | 63          |
| 4:03       | 1500      | 465         | 320 211'        | 14"            |         |           |             |                           |       |             |
| 4:13       | 1500      | 480         | 320 211'        | 15"            |         |           |             |                           |       |             |
| 4:30       | 1500      | 473         | 320 211'        | 14 5"          |         |           |             | Increase RPM, Clear, Cold |       |             |
| 4:35       | 1600      | 508         | 320 211'        | 20"            |         |           |             |                           |       |             |
| 4:43       | 1600      | 508         | 320 211'        | 20"            |         |           |             |                           |       |             |
| 5:00       | 1600      | 508         | 320 211'        | 20"            |         |           |             | Increase RPM, Clear       |       |             |
| 5:03       | 1700      | 566         | 320 211'        | 21.5"          |         |           |             |                           |       |             |
| 5:13       | 1700      | 566         | 320 211'        | 21 5"          |         |           |             |                           |       |             |
| 5:30       | 1700      | 554         | 320 211'        | 20 5"          |         |           |             | Increase RPM, Clear       |       |             |
| 5:35       | 1800      | 662         | 320 211'        | 29.5"          |         |           |             |                           |       |             |
| 5:45       | 1800      | 662         | 320 211'        | 29.5"          |         |           |             |                           |       |             |
| 6:00       | 1800      | 662         | 320 211'        | 29.5"          |         |           |             | Increase RPM, Clear       |       |             |
| 6:05       | 1900      | 726         | 320 211'        | 35"            |         |           |             |                           |       |             |
| 6:15       | 1900      | 726         | 320 211'        | 35"            |         |           |             |                           |       |             |
| 6:30       | 1900      | 726         | 320 211'        | 35"            |         |           |             |                           |       |             |

RECEIVED

JUL 01 2019

Dept of Ecology  
 Central Regional Office

RECEIVED  
JUL 01 2019  
Dept of Ecology  
Central Regional Office

[illegible]



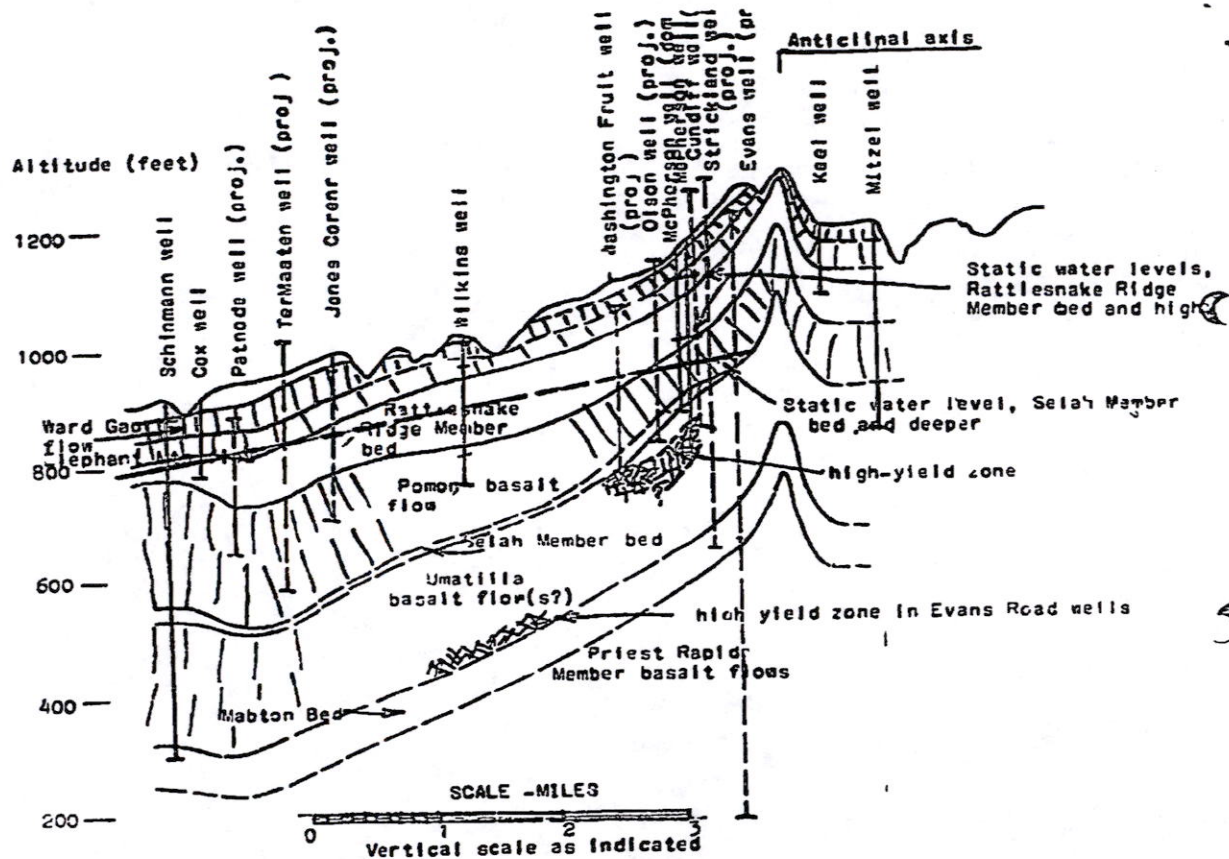


Figure 2. Geologic cross section through the County Line Road - Snipes Road area, showing geologic structures, stratigraphy, key wells, and approximate static water levels. For location see Figure 1.

RECEIVED  
JUL 01 2013  
Dept of Ecology  
Central Regional Office

















# WATER WELL REPORT

Original & 1<sup>st</sup> copy – Ecology, 2<sup>nd</sup> copy – owner, 3<sup>rd</sup> copy – driller

DEPARTMENT OF  
ECOLOGY  
State of Washington

**Construction/Decommission ("x" in circle)**

### Construction

☐ Decommission *ORIGINAL INSTALLATION*

### Notice of Intent Number

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal  
☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other \_\_\_\_\_

TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_  
☐ New well ☒ Reconditioned Method: ☐ Dug ☐ Bored ☐ Driven  
☒ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 323 ft.  
Depth of completed well 318 ft.

CONSTRUCTION DETAILS

Casing ☐ Welded 4" Diam. from 10 ft. to 290 ft.  
Installed: ☒ Liner installed 4" Diam. from 310 ft. to 318 ft.  
☐ Threaded \_\_\_\_\_" Diam From \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: ☐ Yes ☒ No  
Type of perforator used \_\_\_\_\_

SIZE of perfs \_\_\_\_\_ in. by \_\_\_\_\_ in. and no. of perfs \_\_\_\_\_ from \_\_\_\_\_ ft to \_\_\_\_\_ ft.

Screens: ☒ Yes ☐ No ☐ K-Pac Location \_\_\_\_\_  
Manufacturer's Name Western Well

Type PVC Model No. \_\_\_\_\_  
Diam. 4 Slot size .020 from 290 ft. to 310 ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand \_\_\_\_\_  
Materials placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface Seal: ☒ Yes ☐ No To what depth? \_\_\_\_\_ ft.  
Material used in seal Existing  
Did any strata contain unusable water? ☐ Yes ☒ No  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

PUMP: Manufacturer's Name \_\_\_\_\_  
Type: \_\_\_\_\_ H.P. \_\_\_\_\_

WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft  
Static level 212 ft. below top of well Date 06/14/2012  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump-test made? ☐ Yes ☒ No If yes, by whom? \_\_\_\_\_  
Yield. \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs  
Yield. \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Yield. \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)  

| Time  | Water Level | Time  | Water Level | Time  | Water Level |
|-------|-------------|-------|-------------|-------|-------------|
| _____ | _____       | _____ | _____       | _____ | _____       |
| _____ | _____       | _____ | _____       | _____ | _____       |
| _____ | _____       | _____ | _____       | _____ | _____       |

Date of test \_\_\_\_\_  
Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Airstest 42 gal./min. with stem set at 320 ft. for 1 hrs.  
Artesian flow \_\_\_\_\_ g p.m Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? ☐ Yes ☒ No

## CURRENT

Notice of Intent No. WE14712

Unique Ecology Well ID Tag No. BCF827

Water Right Permit No.

Property Owner Name Richard Boushey

Well Street Address County Line & Olsen Road

City Grandview County Benton

Location SW1/4-1/4 NW1/4 Sec 31 Twn 10 R 24  
(s, t, r Still REQUIRED)

EWM ☒

Or

WWM ☐

Lat/Long      Lat Deg    \_\_\_\_    Lat Min/Sec    \_\_\_\_

Long Deg \_\_\_\_\_ Long Min/Sec \_\_\_\_\_

Tax Parcel No. (Required) 131042000005000

[illegible]

**WELL CONSTRUCTION CERTIFICATION:** I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Michael Robinson

Driller/Engineer/Trainee Signature

Driller or trainee License No. 154

IF TRAINEE: Driller's License No:

|                  |                                       |
|------------------|---------------------------------------|
| Drilling Company | Robinson Drilling & Development, Inc. |
|------------------|---------------------------------------|

Address 4902 Viewland Drive

City, State, Zip Yakima, WA, 98908

Contractor's

Registration No. ROBINDD938QE Date 06/15/2012



File Original and First Copy with  
Department of Ecology  
Second Copy — Owner's Copy  
Third Copy — Driller's Copy

# WATER WELL REPORT

STATE OF WASHINGTON

10N/24E-31G1

Application No

Permit No

(1) OWNER Name Richard E Candiff Address 204 Ash Grandview Wash  
(2) LOCATION OF WELL County Benton - SW 1/4, NE 1/4 Sec 31 T 10 N R 24 E WM  
Bearing and distance from section or subdivision corner

(3) PROPOSED USE Domestic ☒ Industrial ☐ Municipal ☐  
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK Owner's number of well (if more than one)  
New well ☒ Method Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS Diameter of well 8 1/2" liner inches  
Drilled ft Depth of completed well ft

## (6) CONSTRUCTION DETAILS

Casing installed 8 Diam from 7 1/2 ft to 20 ft  
Threaded ☐ Diam from ft to ft  
Welded ☐ Diam from ft to ft

Perforations Yes ☐ No ☒  
Type of perforator used  
SIZE of perforations in by in  
perforations from ft to ft  
perforations from ft to ft  
perforations from ft to ft

Screens Yes ☐ No ☒  
Manufacturer's Name  
Type Model No  
Diam Slot size from ft to ft  
Diam Slot size from ft to ft

Gravel packed Yes ☐ No ☒ Size of gravel  
Gravel placed from ft to ft

Surface seal Yes ☒ No ☐ To what depth? 20 ft  
Material used in seal Puddling Clay  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water? Depth of strata  
Method of sealing strata off

(7) PUMP Manufacturer's Name X  
Type HP

(8) WATER LEVELS Land surface elevation above mean sea level ft  
Static level 140 ft below top of well Date 4-16-99  
Artesian pressure lbs per square inch Date  
Artesian water is controlled by (Cap valve etc)

(9) WELL TESTS Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☐ No ☐ If yes by whom? US  
Yield 35 gal/min with ft drawdown after hrs  
By air Rotary Blown

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|------|-------------|------|-------------|------|-------------|
| X    |             |      |             |      |             |

Date of test  
Bailer test gal/min with ft drawdown after hrs  
Artesian flow gpm Date  
Temperature of water Was a chemical analysis made? Yes ☐ No ☐

## (10) WELL LOG

Formation Describe by color character size of material and structure and show thickness of aquifers and the kind and nature of the material in each stratum penetrated with at least one entry for each change of formation

| MATERIAL                | FROM | TO   |
|-------------------------|------|------|
| Top Soil                | 1    | 3    |
| Brown Clay              | 1    | 7    |
| Broken Basalt           | 7    | 13   |
| Hard Basalt             | 13   | 22.5 |
| Broken Basalt with clay | 22.5 | 25.5 |
| Hard Basalt             | 25.5 | 30.5 |
| Broken Basalt           | 30.5 | 32.5 |
| Hard Basalt             | 32.5 | 34.0 |
| Hard Pan Sandstone      | 34.0 | 35.0 |
| Hard Basalt             | 35.0 | 38.5 |
| Broken Basalt           | 38.5 | 38.0 |
| Hard Basalt             | 38.0 | 40.5 |

RECEIVED

JUN 15 1997

DEPARTMENT OF ECOLOGY  
GENERAL REGISTRATION OFFICE

RECEIVED

JUL 01 2019

Dept of Ecology  
Central File

Work started 4-14 1999 Completed 4-15 1999

## WELL DRILLER'S STATEMENT

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

NAME Carmen Water Well's INC.  
(Person firm or corporation) (Type or print)

Address BT 1 Box 1299 Benton City

[Signed] James D. Carmen  
(Well Driller)

License No 0699 Date 4-16 1999

(USE ADDITIONAL SHEETS IF NECESSARY)



File Original and First Copy with  
Department of Ecology  
Second Copy — Owner's Copy  
Third Copy — Driller's Copy

# WATER WELL REPORT

## STATE OF WASHINGTON

9N/24E-5D1

Application No. **GH-26327**Permit No. **64-29608**

(1) OWNER: Name Robert Lambrecht Address Grandview  
(2) LOCATION OF WELL: County Yakima — NW  $\frac{1}{4}$  NW  $\frac{1}{4}$  Sec. 5 T. 9 N. R. 24E W. M.  
ing and distance from section or subdivision-corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐  
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) \_\_\_\_\_  
New well ☐ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches.  
Drilled \_\_\_\_\_ ft. Depth of completed well \_\_\_\_\_ ft.

### (6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from -1 ft. to 240 ft.  
Threaded ☐ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Welded ☒ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Perforations: Yes ☒ No ☐

Type of perforator used \_\_\_\_\_ miles  
SIZE of perforations 1/2 in. by 2 in.  
120 perforations from 200 ft. to 240 ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Screens: Yes ☐ No ☒

Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No. \_\_\_\_\_  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.  
Material used in seal Benite  
Did any strata contain unusable water? Yes ☐ No ☒  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Method of sealing strata off \_\_\_\_\_

(7) PUMP: Manufacturer's Name Moriet's pump  
Type: Sub HP 7 1/2

(8) WATER LEVELS: Land-surface elevation above mean sea level \_\_\_\_\_ ft.  
Static level 110 ft. below top of well Date 9-21-79  
Artesian pressure \_\_\_\_\_ lbs. per square inch Date \_\_\_\_\_  
Artesian water is controlled by \_\_\_\_\_ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level  
Was a pump test made? Yes ☐ No ☒ If yes, by whom? \_\_\_\_\_  
Yield: \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

Pumped with Air 100 g.p.m.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

| Time | Water Level | Time | Water Level | Time | Water Level |
|------|-------------|------|-------------|------|-------------|
|      |             |      |             |      |             |
|      |             |      |             |      |             |
|      |             |      |             |      |             |

te of test \_\_\_\_\_  
Bailer test \_\_\_\_\_ gal./min. with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.  
Artesian flow \_\_\_\_\_ g.p.m. Date \_\_\_\_\_  
Temperature of water \_\_\_\_\_ Was a chemical analysis made? Yes ☐ No ☒

### (10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

| MATERIAL                | FROM | TO  |
|-------------------------|------|-----|
| Top Soil                | 0    | 12  |
| Brown basalt Rock       | 12   | 94  |
| Brown clay with sand    | 94   | 132 |
| Gray sand stone         | 132  | 197 |
| Sand with coarse gravel | 197  | 220 |
| Coarse Gravel           | 220  | 240 |

RECEIVED

JUL 01 2019

Dept of Ecology  
Central E. Council

Work started \_\_\_\_\_, 19\_\_\_\_ Completed \_\_\_\_\_, 19\_\_\_\_

### WELL DRILLER'S STATEMENT:

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

NAME Moriet's Drilling  
(Person, firm, or corporation) (Type or print)

Address RT 2 Box 2207 Selah, Wash.

[Signed] Rich Moriet's Jr.  
(Well Driller)

License No. 0355 Date 9-21, 1979