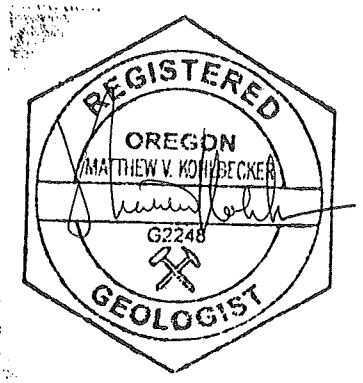
Hillsboro School District: 1J
Liberty High School
Aquifer Storage and Recovery

Limited License Application and
Pilot Test Work Plan

Prepared For
Oregon Department of Water Resources

Prepared By
GSI Water Solutions, Inc.
55 SW Yamhill Street, Suite 300
Portland, Oregon 97204
(503) 239-8799

On Behalf of:
Hillsboro School District: 1J
3083 NE 49th Place
Hillsboro, Oregon 97124



April 2010

Table of Contents

Tables

(Tables are presented at the end of this report.)

Figures

(Figures are presented at the end of this report.)

Appendices

1.0 Introduction

The Hillsboro School District (District) would like to use aquifer storage and recovery (ASR) to irrigate the Liberty High School (LHS) athletic fields in Hillsboro, Washington County, Oregon. ASR would be cost-effective for the District, and would mitigate against declining water levels observed in nearby wells that are completed in the basalt aquifer.

The District is currently irrigating the LHS athletic fields with an irrigation well completed in the Columbia River Basalt Group (CRBG) aquifer. The LHS irrigation well is operated under Permit G-16052, which will expire on October 31, 2010. The Oregon Water Resources Department (OWRD) has determined that a new groundwater right will not be issued to the LHS irrigation well due to declining regional groundwater levels at other wells completed in the basalt aquifer (i.e., WASH 5377 and WASH 5586). As such, the District would like to use ASR to supply irrigation water for the LHS athletic fields and general landscaping. Specifically, surface water would be used to bank a sufficient quantity of water during the winter months that will be used to irrigate the athletic fields in the summer months. ASR would benefit the basalt aquifer because native groundwater would not be used to irrigate the athletic fields thereby mitigating against the observed water level declines. Figures 1 and 2 are maps of the Liberty High School vicinity that show the LHS irrigation well and vicinity basalt wells (including WASH 5377 and WASH 5586, where water level declines have been observed). Figure 3 shows a hydrograph of the wells with declining water levels along with water levels for the LHS well.

Injection testing conducted in January 2010 indicates that ASR is feasible at the LHS irrigation well. The District intends to use treated drinking water from the Tualatin Valley Water District (TVWD) for ASR source water, and would inject and extract water using the existing LHS irrigation well (WASH 58925). The LHS irrigation well would be retrofitted for ASR purposes prior to ASR pilot testing.

This document is an ASR limited license application and includes a work plan for the proposed ASR project. The ASR limited license application and work plan are in compliance with Oregon Administrative Rules (OAR) 690-350-020 (OAR, 2010). The following index identifies where information required under OAR 690-350-020 can be found in this application. The index was prepared to assist in preparing and reviewing the District's application for an ASR limited license.

OAR	Information Location
690-350-020 (2) **Pre-Application Conference**	June 18, 2009 -> Lafayette Pre-app 11/10/09 - Pre-pre app.
690-350-020 (3) (a) **Applicant Information**	Application Form (Appendix A)
690-350-020 (3)(a)(B) **Operations Information**	Section 5 – Pilot Testing Program (Pages 17 - 20), ASR Limited License Application (Appendix A)
690-350-020 (3)(a)(C) **License Duration**	Section 5 – Pilot Test Program (Page 20)
690-350-020 (3)(a)(D) **Proposed Use**	Section 5 – Pilot Test Program (Page 20)
690-350-020 (3)(a)(E) **Ultimate Project Size**	ASR Limited License Application (Appendix A)
690-350-020 (3)(a)(F) **Water Right Statement**	Section 3 – Permits and Approvals (Page 14) and Appendix D

690-350-020 (3)(a)(G) **Water Right Holder Agreement**	Appendix E
690-350-020 (3)(a)(H) **Legal Land Use**	Appendix F
690-350-020 (3)(a)(I) **Map**	Figure 2
690-350-020 (3)(a)(J) **DHS Compliance**	Section 5 – System Operation and Wellhead Facility Design (Page 16)
690-350-020 (3)(a)(K) **Supplemental Information**	Appendix I
690-350-020 (3)(b)(A) **Proposed ASR Test Program**	Section 5 – Pilot Testing Program (Page 17 – 20), Section 6 – Water Quality Monitoring Program (Page 21), Section 7 – Quality Assurance and Quality Control Plan (Pages 22 – 24), Figure 2, Tables 2 and 3, Appendix J
690-350-020 (3)(b)(B) **Proposed System Design**	Section 4 – System Operation and Wellhead Facility Design (Page 16) and Appendix H
690-350-020 (3)(b)(C) **Groundwater Information**	Section 2 – Hydrogeologic Setting, Water Quality, and ASR Well construction (Page 7 - 13), Figures 4 and 5
690-350-020 (3)(b)(D) **Source Water Quality**	Section 2 – Hydrogeologic Setting, Water Quality, and ASR Well construction (Pages 7 – 13), Table 1 and Appendix B
690-350-020 (3)(b)(E) **Comments on Source Water/Standards**	NA – (i) and (ii) do not apply
690-350-020 (3)(b)(F) **Receiving Water Quality**	Section 2 – Hydrogeologic Setting, Water Quality, and ASR Well construction (Pages 7 – 13), Table 1 and Appendix B
690-350-020 (3)(b)(G) **Comments on Compatibility**	Section 2 – Hydrogeologic Setting, Water Quality, and ASR Well Construction (Pages 7 – 13)
690-350-020 (3)(c) **Other Information**	UIC Registration located in Appendix G

Appendix A presents a completed Oregon Water Resources Department (OWRD) ASR Limited License Application for pilot testing at the Liberty High School irrigation well. The form was completed in a manner that allows operational flexibility during the testing period.

1.1 ASR Pilot Testing Objectives

The purpose of ASR pilot testing is to evaluate ASR feasibility in the basalt aquifer beneath LHS, and to develop design criteria for full-scale ASR operation. The pilot testing will be conducted in a controlled manner designed to provide the data necessary to develop an initial ASR operational plan. The objective of the pilot testing is to evaluate the following:

- Wellhead facility operation and response to ASR
- Aquifer hydraulic response to ASR
- Long-term performance of the ASR well
- Optimal rate of injection and target storage volume
- Recovery rate and sustainability of pumping
- Chemical compatibility of the native groundwater and source water (including an assessment of mixing, potential clogging, and potential water quality changes)

- Quality of recovered water over time
- Frequency of redevelopment necessary to maintain an acceptable and sustainable degree of well efficiency during full-scale operations
- Potential impacts of ASR including loss of stored water to springs, other aquifers, or surface water; slope instability; water quality degradation; and interference with surrounding wells as a result of injection and recovery.

The goal of pilot testing is to complete a testing program that can be used to apply for a permanent ASR permit.

1.2 Pilot Testing Approach

During the pilot testing program, recharge is conducted in a controlled manner, and the ASR well and aquifer response to initial ASR operations are evaluated. Details of the pilot testing procedures are presented in Section 5. The first year of the pilot testing program will consist of several tests conducted at the LHS irrigation well, including a shakedown test followed by a full recharge-storage-recovery cycle. The shake down test assesses the performance of the piping, pumps, valves, and controls, and lasts about one day. During this test, a relatively small volume of water will be injected and recovered to evaluate initial system operations and aquifer response. The full recharge-storage-recovery tests (i.e., cycle tests) more closely approximate operational-scale ASR.

During the initial pilot testing at the LHS irrigation well, it is anticipated that water may be injected at recharge rates up to 100 gpm and recovered at pumping rates of up to 320 gpm. The maximum storage volume requested under this ASR Limited License is 30 million gallons (MG), which is more than the target volume of approximately 13 MG needed to irrigate the LHS athletic fields per year. Specifically the 30 MG storage volume request would hedge against longer drought periods by allowing LHS to carry-over water from year-to-year to hold more water in storage. The ASR Limited License request is for 5 years with the possibility of renewal if additional testing is warranted. The requested storage volume is significantly less than the available storage volume of the basalt aquifer at LHS (840 MG, based on an aquifer thickness of 8 feet, aquifer porosity of 4 percent, and radius of influence of approximately 2 miles).

During the first year of pilot testing, up to 100 percent of water originally injected may be recovered to provide data for assessment of mixing zone size and geochemical interactions. During subsequent years of operation, injection, storage, and recovery rates and durations will be determined on the basis of the volume of water recovered the previous year. It is anticipated that the District will inject water from late fall to early summer (November 1 through June 30) of each year so that the maximum amount of water can be stored.

2.0 Hydrogeologic Setting, Water Quality, and ASR Well Construction

Liberty High School (Figure 2) is located in Hillsboro, Washington County, Oregon. Figure 4 is a geologic map of the LHS vicinity and Figure 5 is a geologic cross section (A to A'), with the cross section location shown in Figure 4. Geologic units beneath LHS include fine-grained unconsolidated silts, sands, and gravel lenses (approximately 300 feet thick at LHS) and underlying basalt of the CRBG. The aquifer hosted by the sediments typically has low yields and limited storage capacity. **The basalt is the target aquifer for ASR at LHS.** This section presents preliminary hydrogeologic information about the target aquifer for ASR (i.e., the CRBG) required under OAR 690-350-020(3)(b)(C) and OAR 690-350-020(3)(b)(D).

2.1 Geology

The CRBG consists of Miocene-age (23 to 5.3 million years ago) basalt lava flows originating from linear fissures in eastern Washington and Oregon and western Idaho. The CRBG outcrops west and east of LHS in the Coast Range and Tualatin Mountains, respectively (see Figure 4), and dips toward the center of the Tualatin Basin. An oil test well drilled by the Texas Oil Company in 1947 on Cooper Mountain (WASH 10236) indicates that the CRBG is approximately 1,000 feet thick in the Tualatin Basin. Based on a geologic log for irrigation well WASH 5586 (located approximately two miles southwest of the LHS irrigation well), the basalt beneath LHS consists primarily of the Grande Ronde Formation of the CRBG (Tolan and Beeson, 1986).

2.2 Aquifer Description

The CRBG basalts contain some of the most productive aquifers in Oregon and comprise the target aquifers for ASR at LHS. Vertical exposures through CRBG flows reveal that they exhibit the same basic three-part internal arrangement of features shown in Figure 6. These intraflow structures originated during emplacement and cooling of the lava flow and are referred to as flow top, dense flow interior, and flow bottom. The combination of the flow top and flow bottom is commonly referred to as the "interflow zone," and hosts the aquifer (Tolan et al., 2000). Because groundwater levels in water wells completed in the CRBG rise above the top of the CRBG aquifer, the aquifer is considered semi-confined to confined.

CRBG aquifer transmissivity was estimated from a five day, constant rate injection test at the LHS irrigation well. Water was injected in the LHS irrigation well at a rate of 50 gpm, and water levels were measured with an electronic water level meter and pressure transducer/datalogger. Figure 7 is a time-mounding analysis of water levels in the well during the injection test. No hydraulic boundaries were encountered during the test. As is shown on Figure 7, CRBG aquifer transmissivity is approximately 2,600 gallons per day per foot (gpd/ft).

Porosity and storativity of CRBG interflow zones have not been measured at the LHS irrigation well. Based on Tolan et al., (2000), the porosity of CRBG interflow zones is expected to range from 6% to over 25% (flow top breccias) and 3% to 6% (vesicular flow top). Based on storage measurements at the City of Beaverton's ASR Well No. 3, the

storativity of CRBG interflow zones is expected to be on the order of 0.001.

2.3 Conceptual Hydrogeologic Model

Groundwater recharges the CRBG where it outcrops in the Tualatin Mountains and Coast Range on the east and west edges of the Tualatin Basin, respectively. Groundwater likely flows down-dip along basalt interflow zones. Because the dense flow interiors of the CRBG have extremely low permeabilities, it is unlikely that the overlying unconsolidated sediments are in hydraulic communication with the CRBG interflows.

There are several geologic characteristics that can locally modify the hydraulic behavior of CRBG aquifers including faults, folds, and secondary mineralization. Faults can form barriers to the lateral and vertical movement of groundwater, but they also can (1) provide vertical pathways, (2) cause secondary fracturing to enhance the interconnection between interflow zones, and (3) expose interflow zones to local opportunities for aquifer recharge and/or discharge. Folding of the CRBG can fracture the flows enhancing secondary permeability, possibly providing a vertical pathway to enhance interconnection between interflow zones. However, if these secondary fractures heal or are "filled" with secondary mineralization, which is often the case, the overall effect results in significant reduction in permeability of the aquifer system (Tolan et al., 2000).

2.4 Flow Direction and Rate of Movement

We do not currently have the information (i.e., well elevations surveyed to the nearest 0.01 foot) to determine groundwater rate of movement. However, the potentiometric surface of CRBG groundwater at LHS likely favors a down-dip (i.e., westward) groundwater flow direction, subject to the geologic characteristics that could modify hydraulic behavior of the CRBG and influence from vicinity irrigation wells.

2.5 Area Affected by the ASR Well

The area affected by the LHS ASR well was estimated using the Theis equation to calculate the aerial extent of mounding in the CRBG aquifer (e.g., Fetter, pg. 224, 1994):

$$\Delta s = \frac{Q}{4\pi T} \ln\left(\frac{4Tt}{1.78r^2 S}\right) \quad (1)$$

Where s is mounding (feet), Q is injection rate (ft^3/day), T is transmissivity (ft^2/d), t is time (days), r is radial distance from the well with a mounding of s (feet), and S is storativity (dimensionless). The aerial extent of mounding (i.e., area affected by the ASR well) was defined as the portion of the CRBG that experiences greater than 2.0 feet of water level rise during ASR cycle testing. Assuming T = 2,600 gpd/ft (350 ft^2/day), Q= 100 gpm (9,600 ft^3/day), t= 240 days, s = 2.0 feet, and S= 0.001, we calculate that the aerial extent of mounding (i.e., r, the area affected by the ASR well) is approximately two miles. Therefore, the area affected by the ASR well is the basalt aquifer within two miles of the LHS irrigation well. This aerial extent of mounding is shown in Figure 8.

2.6 Allocation of Surface Water, Springs, or Wells in the Affected Area

Water right allocations in the area affected by the ASR well are shown on Figure 8. Surface water and spring allocations are not shown in Figure 8 because the basalt aquifer is buried by at least one hundred feet of sediments in the affected area. Groundwater rights are shown for wells completed in the basalt aquifer, and for wells where an aquifer determination could not be made.

2.7 Anticipated Changes to the Groundwater System

The District anticipates that ASR will beneficially affect the groundwater system by reducing the rate of groundwater decline or stabilizing groundwater levels in the basalt aquifer by the fact that native groundwater will not be appropriated by LHS to irrigate the athletic fields.

2.8 Potential Natural Resources Problems of Testing

The District does not anticipate any impacts to natural resources from ASR testing.

2.9 Other Information

Specific capacity was calculated from the injection test (e.g., Driscoll, 1986). Specific capacity is a measure of well performance that relates drawdown in a well to well yield:

$$SC = \frac{Q}{s} \quad (2)$$

where:

SC is specific capacity (gpm per foot of drawdown)
Q = well yield (gpm)
s = drawdown (feet)

After about 12 hours (720 minutes) of injecting, the specific capacity stabilized at approximately 1 gpm/ft.

2.10 Water Chemistry

This section discusses water quality of the TVWD source water and native basalt groundwater, and evaluates the effects of mixing TVWD source water and native basalt groundwater. As discussed later in this section, we do not expect any adverse reactions or impacts from mixing between TVWD source water and native basalt groundwater.

Native groundwater and source water analytical results are presented in Table 1. The native basalt groundwater sample was collected from the LHS irrigation well on January 11, 2010, and submitted to Alexin Analytical Laboratories (Tigard, Oregon) for analysis. The two TVWD source water samples were collected on December 16, 2008, and April 13, 2009. These two samples were averaged for this analysis. Laboratory reports are provided in Appendix B.

TVWD source water meets the regulatory criteria for all Safe Drinking Water Act constituents and thus is suitable for ASR purposes. This statement is supported by the fact that TVWD is currently being used to recharge the TVWD's ASR well under ASR Limited License #002 and has complied with all state ASR regulatory criteria since TVWD began

recharging their ASR well in 2009.

Water Quality of Source Water and Native Basalt Groundwater

This section compares TVWD source water and native basalt groundwater using graphs that show chemical components of the two waters. The comparison uses Piper Plots, Stiff Diagrams, and graphs of constituent concentrations to evaluate similarities and differences between TVWD source water and native basalt groundwater.

Figure 9 is a plot of chemical parameters in TVWD source water and native basalt groundwater. The plots for source water and native basalt groundwater reflect some marked dissimilarities. Specifically, the concentrations of bicarbonate (HCO_3^-), calcium (Ca), chloride (Cl), sodium (Na), and silica (Si) are higher in the native groundwater than in TVWD source water. Not shown in Figure 9 is the concentration of Total Dissolved Solids (TDS) in the waters, which is also significantly higher in the native basalt groundwater (396 mg/L) than in the TVWD source water (85 mg/L). The differences in these concentrations probably reflect the fact that the native groundwater has a long residence time in the aquifer as opposed to the TVWD source water being surface water. Not as evident in the figure are the differences in the chemical state parameters of temperature, dissolved oxygen and pe [i.e, pe = 0.017(oxidation reduction potential)]. The native basalt groundwater is more reducing and higher temperature than the TVWD source water. However we would anticipate the opposite temperature correlation in the summer months between native and source water. Figure 9 shows that the two waters have equilibrated to different environments. Therefore, it is possible that a subsurface mixing of source water and native basalt groundwater may result in chemical reactions that equilibrate the mixed water with the subsurface environment.

Piper plots and Stiff diagrams are used to classify waters, and are provided in Figures 10 and 11, respectively. Differences in native basalt groundwater and source water are shown on the Piper Plot (Figure 10), with source water classified as a mixed cation-bicarbonate type and native groundwater classified as a mixed cation-bicarbonate-chloride type. Compositional differences in source water and native basalt groundwater are also shown on the Stiff diagram (Figure 11). With the exception of sulfate (SO_4), the concentrations of the cations and anions are much higher in the native basalt groundwater, contributing to the higher TDS value for native basalt groundwater as compared to the TVWD source water.

It should be pointed out that there is a large ion (i.e., cation-anion) charge imbalance (17.3% as opposed to an analytical acceptable value of <5%) in the analyses of the native groundwater suggesting a possible analytical error by the laboratory. However, we do not believe that the error is significant with respect to the compatibility analysis discussed below, which is based primarily on saturation indices and not ion abundances.

Mixing of Source Water and Native Groundwater

The United States Geological Survey water chemistry software package PHREEQC was used to evaluate the geochemical compatibility of native basalt groundwater and TVWD source water. PHREEQC simulates mixing of two waters and calculates mineral solubility in the mixed water. This software is applicable to evaluating ASR feasibility because it assesses whether mixing between source water and native groundwater will cause precipitation of minerals within the aquifer and/or well screen.

PHREEQC was used to evaluate the following chemical reactions that could potentially result from mixing of native basalt groundwater and TVWD source water:

- Mineral precipitation in unmixed water, and
- Mineral precipitation in mixed water.

Mineral precipitation depends on mineral solubility in water and water chemistry. The effect of mineral solubility and water chemistry is determined by calculating the saturation index (SI) for a mineral using PHREEQC. The SI is the log of the ratio of actual concentration of the mineral components divided by the theoretical concentrations of the mineral at saturation (i.e., the solubility) for the chemical state being considered. If the SI is negative, then the solution is undersaturated in a mineral, and a mineral will dissolve in the solution. If the SI is positive, then the solution is oversaturated in a mineral, and a mineral will have a tendency to precipitate from the solution. A positive SI value doesn't necessarily mean the mineral will precipitate, only that it has a tendency to do so. The precipitation and growth of a mineral is complicated by the fact that before the mineral can grow, a mineral nucleus is needed to form spontaneously in the solution, which generally requires the SI to be a value greater than one.

Saturation indices for native basalt groundwater and TVWD source water are shown in Figure 12. The SI for gypsum in native basalt groundwater is not shown in Figure 12 because the sulfate was not detected in the native basalt groundwater sample. With the exception of the silica minerals chalcedony and quartz, TVWD source water is undersaturated with respect to all of the more common clogging minerals. Native basalt groundwater tends to be at saturation or slightly oversaturated with respect to all of the minerals shown in Figure 12 except for the clay mineral sepiolite, evaporite halite, and the manganese mineral pyrolusite.

Common minerals that result in clogging include iron hydroxides ($FeO(OH)_3$) and calcite ($CaCO_3$). Neither source water nor native basalt groundwater contain detectable iron, therefore eliminating the potential of clogging by iron hydroxides. The SI for calcite is negative 0.91 for the TVWD source water; therefore, no precipitation of calcite is anticipated for this water. The SI for calcite is 0.44 for the native groundwater indicating a condition of saturation to oversaturation with respect to calcite. However, an important constituent in the solubility of calcite is the bicarbonate (HCO_3^-) molecule. Given the variation in bicarbonate (HCO_3^-) between the two waters (Figure 9), and the slightly different chemical states, it is necessary that we evaluate the SI values resulting from mixing of the two solutions.

Figure 13 shows the saturation indices for mixtures of native groundwater and the TVWD source water for different mixing proportions. SI values for gypsum were calculated by assuming SO_4 concentration was zero in native basalt groundwater. The SI values for both waters individually are also shown for comparison. It is apparent from Figure 13 that the mixtures of native groundwater with TVWD source water remain slightly oversaturated with respect to calcite, chalcedony, dolomite, and quartz.

Precipitation is a relatively slow chemical reaction. Precipitation of a mineral phase

requires the formation of a nucleus about which the individual ions can attach as the mineral grows. Typically, the growth of a given mineral can take months to years. Given the low level of oversaturation of these minerals, and the time scale of a typical ASR cycle (typically one year assuming 100% of recovered water), it is not likely that significant mineral accumulation will occur as a result of the ASR process. The potential impact of calcite precipitation can be evaluated by assuming that 50% of the dissolved Ca in the mixed native basalt groundwater and source water precipitates as calcite. Calcite has a molecular volume of 6.13×10^{-23} cm^3/molecule. In the mixed water, Ca has a concentration of 44.8 mg/L or 1.121×10^{-3} mole/L. From these numbers and the 50% precipitation assumption, we can calculate that the volume of precipitated calcite would be approximately 0.02 cm^3 for every liter of water (which is equivalent to 0.002% of the aquifer porosity). Such a low volume of calcite precipitation is probably insignificant and likely would not affect the ASR operation.

There is a high total organic carbon (TOC) in both the TVWD source water and the native groundwater. TOC is a microbiological food source that could lead to some biofouling, although given the low Fe content (less than 0.05 mg/L), the formation of iron bacteria would likely be minimal. However, iron bacteria content should be monitored during pilot testing.

Summary of Observations

1. The composition of the ASR source water from TVWD is a mixed cation-bicarbonate water with low total dissolved solids, while the native groundwater is a mixed cation bicarbonate chloride water, absent of SO_4 and high in total dissolved solids.
2. TVWD source water and native basalt groundwater have evolved in different environments.
3. The compositional patterns for source and receiving waters reflect some marked dissimilarities. This is particularly so with respect to the concentrations of HCO_3^-, Ca, Cl, Na, and Si. All are higher in the native groundwater than in the TVWD source water.
4. The source water is oxidizing in character, while the native groundwater is reducing in character (i.e., oxygen deficient).
5. The native groundwater has higher temperature and lower dissolved oxygen than the TVWD source water. However, we would anticipate the native groundwater will be cooler than source water in the summer months.
6. In source water, the saturation indices for the more common minerals (i.e., calcite, dolomite, gypsum, and halite) are less than zero. In native basalt groundwater, saturation indices for more common minerals (i.e., calcite and dolomite) are at or slightly above zero, with the exception of halite, which is less than zero.
7. The minerals calcite, dolomite, chalcedony, and quartz are slightly oversaturated in the groundwater and in mixtures of groundwater and surface water.
8. The saturation indices for chalcedony and quartz are greater than zero in mixed water (0.4 to 0.9); however, it is unlikely that these minerals would nucleate and grow, particularly on the time scale of an ASR cycle (typically one year assuming 100% recovery of stored water).

9. The SI for calcite is also low. Nucleation and growth of this mineral is considered more likely; however, assuming half of the Ca in solution was to precipitate as calcite, approximately 0.002% of the pore spaces would be filled.
10. Growth of iron bacteria during ASR (which results in biofouling that clogs the well screen and formation) will likely be minimal because the iron contents of TVWD source water and native basalt groundwater are low. However, the potential exists for biofouling because total organic carbon is high in TVWD source water and native basalt groundwater. Therefore, iron bacteria should be monitored during pilot testing.

In conclusion, TVWD source water and native basalt groundwater are compatible and no reactions that would impact the ASR process are expected.

2.11 ASR Well Construction Details

The driller's well log and as-built diagram for the Liberty High School irrigation well is provided in Appendix C. The Liberty High School irrigation well is 648 feet deep and most likely obtains water from one basalt interflow zone from 574 feet to 582 feet below ground surface (bgs). The well is sealed to a depth of 510 feet bgs and has a 10-inch diameter open borehole from 510 feet to 648 feet bgs. This well is constructed in accordance with State of Oregon standards. The District has measured static water levels in the LHS irrigation well since 2004 (Figure 3). Static water levels have declined from 79 feet bgs in March 2004 to 83 feet bgs in March 2009. The pump is a 40 horsepower submersible that is set at a depth of approximately 460 feet bgs. The District plans to modify the wellhead for the Liberty High School irrigation well for ASR purposes, as described in Section 4.

3.0 Permits and Approvals

This section identifies permits and approvals necessary to conduct ASR pilot testing and provides documentation that the permits and approvals have either been obtained, requested, or are not necessary for the ASR pilot testing.

3.1 Source Water Rights

The District intends to utilize water from TVWD for ASR source water during late fall to early summer (November 1 through June 30). TVWD is a regional water provider that receives water from the Portland Water Bureau (PWB) and the Joint Water Commission (JWC), and provides more than an average of 20 million gallons per day of treated drinking water to its customers inside its service area including portions of the Cities of Beaverton, Tigard and Hillsboro. TVWD water source (and therefore water rights) depends on location within the TVWD. At LHS, TVWD source water is supplied by JWC and is appropriated under surface water rights owned by the City of Hillsboro. Specifically, the City of Hillsboro provides the TVWD with water under water rights certificates 81026, 81027, 67891 and 85913. Water rights certificates for TVWD source water are provided in Appendix D. Because the District is not the holder of the water right for ASR testing, a statement from the water right holder (i.e., City of Hillsboro) indicating permission for use of TVWD source water for ASR testing is provided in Appendix E, as required by OAR 690-350-0020(3)(G).

3.2 Groundwater Rights

The District does not have a water right for the Liberty High School irrigation well (WASH 58925). The irrigation well has been operating under a temporary permit (Permit G-16052), which will expire on October 31, 2010. Therefore, the volume of groundwater extracted from the LHS irrigation well over a pilot testing cycle will be limited to the injected volume.

3.3 Wastewater Discharge Approval

During the ASR pilot testing, some well water, distribution system water, and stored water will be pumped to waste to minimize and control particulates in the well or the distribution system. Discharges to waste will include backflushing episodes when injection will be stopped and the pump turned on for approximately 15 to 30 minutes to remove particulates that may have entered the well during recharge, and distribution system flushing conducted just prior to starting injection cycles to remove any particulates from the lines prior to injection of water into the aquifer. The pump to waste discharge will be conveyed to a storm manhole (located approximately 300 feet south of the pump house) or to the athletic fields. The discharge water will consist of ASR source water (treated drinking water), native groundwater, or a mixture of the two. All proposed components of the pump to waste system will obtain the appropriate local and state permits prior to installation and operation.

3.4 Underground Injection Control (UIC) Registration

Appendix G contains a completed UIC registration form for ASR. This form was submitted to the Department of Environmental Quality and rule-authorized (UIC # 14059).

4.0 System Operation and Wellhead Facility Design

Prior to Pilot testing, the Liberty High School irrigation well wellhead will be retrofitted for ASR operation. The retrofitting of the well will allow the well to supply water to the irrigation system during the irrigation season and to inject potable water into the aquifer during the non-irrigation season. The well will be controlled manually. The retrofitted ASR wellhead will be situated within the existing pump house and wellhead facility. A schematic as-built of the existing well and a diagram showing proposed wellhead assembly and piping are provided in Appendix H. The retrofitted ASR wellhead will be constructed in accordance with DHS standards, and will include the following:

- Piping valves that allow for flushing distribution system water lines that provide injection source water to remove particulates prior to injection.
- ASR injection line valves that allow for pump-to-waste during periodic back flushing events.
- Controls to monitor turbidity and shutdown ASR injection at adjustable nephelometric turbidity unit (NTU) settings. The turbidity meter will be located far enough upstream of the wellhead in order to provide sufficient time for the well to be shutdown if a turbidity event occurs.
- A bi-directional totalizing flow meter that can provide real-time data during injection and recovery.
- A dedicated downhole water level transducer so that the performance of the well can be monitored.
- An access port for manual water level measurements.
- Access ports for sampling during injection, storage and recovery
- Possibly a downhole control valve or orifice plate, if needed to maintain enough back pressure to ensure the injection pipe remains full during injection.

Design plans of the wellhead modifications will be forwarded OWRD for plan review prior to initiating construction, and after approval, the final documentation will be sent to OWRD.

5.0 Pilot Testing Program

The purpose of pilot testing is to confirm ASR feasibility at the LHS irrigation well, and to develop design criteria for full-scale ASR operation within the basalt aquifer. The pilot testing program described below is the framework that will be implemented initially at the Liberty High School irrigation well.

The pilot testing program under an ASR limited license consists of two components:

- **Baseline Testing and Monitoring** – Includes water level monitoring and well testing initiated before the start of ASR testing to document pre-ASR aquifer conditions and well performance.

- **ASR Testing** – ASR testing is divided into yearly cycle tests. Each ASR pilot testing cycle includes an injection period, a storage period, and a recovery period.

  - ***Year 1*** – Includes a shakedown test and a longer-duration, operational-scale pilot testing cycle.

  - ***Years 2-5*** – Injection, storage, and recovery rates and duration for subsequent pilot testing cycles will be determined on the basis of previous year operations. Because all of the stored water may not be fully recovered each year, the subsequent year's injection volume may be reduced.

Each of the testing components is presented in the following subsections.

5.1 Baseline Testing and Monitoring

The purpose of the baseline testing and monitoring is to obtain background water level data in the vicinity of the ASR well and to assess pre-ASR well performance and aquifer characteristics. It is important to note that the LHS has been collecting native groundwater level baseline data for several years (see Figure 3). These data are compared to data collected during ASR testing to evaluate the effects of ASR on the aquifer and well. Baseline testing at LHS consists of:

Water Level Monitoring

The District has measured water levels at the LHS irrigation well annually from 2004 to 2006, and quarterly from 2006 to the present (Figure 3). Two weeks prior to Year 1 ASR testing, the District will begin more frequent monitoring at up to three wells completed in the basalt aquifer at LHS, assuming LHS is given access by local well owners. LHS may need OWRD's assistance in securing access to local wells in order to collect observation data. Specifically, water level measurements will be collected manually twice per week, or less if data support less frequent measurements, using an electronic water level sounder, as access permits. In addition, water levels at two wells will be monitored with electronic data loggers and pressure transducers (depending on access).

At a minimum, water level monitoring will include the LHS irrigation well (WASH 58925). Water well records from OWRD were reviewed to identify existing observation wells in the pilot test study area that could be used to evaluate background water levels and

aquifer conditions in the deep basalt aquifer during future ASR testing or full-scale operations. The following potential observation wells were identified:

- WASH 59240
- WASH 54761
- WASH 51138
- WASH 2118
- WASH 51064
- WASH 4012
- WASH 56477

The potential observation well locations listed above are shown in Figure 1, and well logs are provided in Appendix C. The District attempted to obtain approval for access to these wells, however efforts were unsuccessful. The District is interested in working with OWRD to ensure that there is an available observation well prior to ASR Pilot Testing.

Well Testing
A step rate aquifer test was conducted after well installation, and a five day, constant rate injection test was conducted in January 2010. The results of these tests are provided in (Appendix I). The January injection test was conducted under an underground injection control permit (UIC # 14059). The specific capacity of the well is roughly 1.0 gallons per minute per foot of drawdown/drawup; this is a low value but sufficient for the intended storage volume (see Appendix I).

During the January 2010 constant rate injection test, potable water from TVWD was injected in the basalt aquifer for five days at a constant rate of 50 gpm. As shown on the hydrographs in Appendix I, the static water level trend in the LHS irrigation well was flat and at a depth of approximately 93 feet bgs prior to injection. Approximately 45 feet of mounding occurred in the injection well after five days of injecting at 50 gpm and the projected drawup line shows that water levels within the well will remain below the ground surface. After injection stopped, water level in the irrigation well recovered to within 95% of pre-injection static water level within approximately 14 minutes. No negative hydrogeologic boundary conditions that could adversely affect the long-term performance of an ASR well were encountered during the 5-day injection test

5.2 ASR Testing: Year 1

This section describes the first year of pilot testing at the LHS irrigation well. The testing will consist of an initial shake-down test followed by a longer-duration, operational-scale pilot testing cycle. Each of the testing cycles and the planned monitoring are described in the following sections.

During pilot testing, water levels will be measured in the same wells used for baseline groundwater monitoring. The purpose of monitoring water levels is to assess aquifer response to injection and extraction, benefits to other production wells, and adverse impacts from ASR (e.g., creation of new springs and seeps). It is important to note that it is highly unlikely that seeps will occur due to this project since the basalts are capped by 300 feet of sediment and the potentiometric surface during injection (mounding cone) will

not reach the ground surface. The LHS irrigation well will be instrumented with a pressure transducer and datalogger that will record water levels approximately every 5 minutes. Other well locations will be monitored bi-weekly using a water level sounder, unless they are instrumented with dataloggers and pressure transducers.

The initial recommended operational rates for pilot testing of the Liberty High School irrigation well are presented in Table 2. It is anticipated that TVWD source water may be injected at recharge rates up to about 100 gpm and recovered at pumping rates of up to approximately 320 gpm during initial pilot testing. These maximum rates are based on maximum available drawup, maximum available drawdown, and the specific capacity (1 gpm per foot of drawdown) observed at the LHS irrigation well, and are less than the maximum rates allowed under the TVWD water right [as stipulated in OAR 690-350-0010(2) and OAR 690-350-0010(3)]. Actual recharge and recovery rates during the ASR pilot testing program at the LHS irrigation well will be based on transient aquifer and well conditions, and are anticipated to average 50 gpm (recharge) and 240 gpm (recovery).

Water quality samples will be collected during pilot testing. The planned water quality monitoring program is presented in Sections 6 and 7.

Shakedown Test

Before initiating the first pilot testing cycle, a shakedown test will be performed that will consist of injecting TVWD water into the LHS irrigation well to check the operation of the injection system. The function of the automatic flow control system and the downhole valve (if one is used) will also be checked. Adjustments to the system will be made as necessary. After the short injection period, the well pump will be operated to recover all of the injected water and check well pump operation. The injection and pumping rate will be adjusted to optimize system operation for the longer cycle test. The shakedown test is anticipated to last 8 hours. Recovered water from the testing will be directed into the District's irrigation system, except for short periods of pumping water to waste at the beginning of pumping when the water may contain particulates.

Cycle 1

The objective of Cycle 1 is to evaluate the long-term aquifer response, well performance, and water quality conditions under operational-scale ASR in the basalt aquifer.

Cycle 1 will consist of injection, storage, and recovery phases. The injection phase of Cycle 1 will be used to assess head buildup in the aquifer, increased production performance resulting from recharge, potential for loss of stored water, and injection well efficiency changes over time. The storage phase will be used to determine if the quality of the stored water changes substantially during storage and the degree to which the head buildup is maintained. A step-rate pumping test will be performed at the start of the recovery phase, and will consist of pumping the LHS irrigation well at three pumping rates (75 gpm, 130 gpm and 220 gpm) for approximately 2 hours each. Results of the step-rate test will be compared to the baseline step-rate test to assess changes in well efficiency following ASR. The recovery portion of Cycle 1 will be used to estimate the amount of mixing between source water and native groundwater, and to identify changes in well performance and aquifer characteristics relative to the initial baseline pumping tests.

Cycle 1 of pilot testing will consist of injecting, storing, and recovering TVWD source water at the LHS irrigation well. The Cycle 1 schedule will depend on LHS irrigation demands and well performance, but is anticipated to consist of:

- An approximately 210-day injection period from November 1 through May 30 (or possibly into June) (with a minimum storage target of 13 MG at an estimated average injection rate of 72,000 gallons per day at 50 gpm and a maximum storage target of 30 MG at 144,000 gallons per day at 100 gpm).
- An approximately 30-day storage period (some portion of June 2010).
- A 150-day recovery period from July 1 through November 31 (potentially recovery of up to 100 percent of injected volume and a recovery rate of up to 300 gpm assuming only 13 MG is stored in a given year, or potentially carrying over some storage to hedge against future drought periods).

The rates and volumes described above are estimates only and may vary significantly. Consequently, the total amount of water stored in a given year may be variable and could be up to the maximum amount of 30 MG as requested in the application.

As shown in Table 2, water quality samples will be collected during ASR testing to characterize the mixing zone during the end of the target recovery volume (using criteria developed during baseline monitoring). The recovered water will be put into the District's irrigation system. Water quality sampling and analysis procedures and frequency are described in Section 8 of this work plan.

Contingency Plan
The District intends to use recovered water in its irrigation system. In the unlikely event that the quality of the injected water becomes impaired or the recovered water is unacceptable, all of the water injected into the aquifer will need to be recovered and pumped to waste. The current wellhead system will be modified to allow for discharge of water to the storm system or a field that can accept impaired water; this event is assumed to be highly unlikely however. On the basis of the water quality analysis conducted to date and our experience with ASR in basalt aquifers throughout the region, the likelihood of this situation occurring appears highly improbable.

5.3 ASR Testing: Years 2 through 5

The results of the Year 1 pilot testing at the Liberty High School irrigation well will be evaluated and used to optimize ASR operation in future years. Target ASR volumes, rates, durations and schedules will be developed on the basis of Year 1 results. The planned ASR operations plan for the following year will be submitted with each annual report. Any modifications to the sampling and monitoring plan provided in Table 2 will be submitted to OWRD for review and approval.

Limited License Duration
The District is seeking approval of a limited license for a duration of 5 years with the option to extend the limited license period for an additional length of time if needed.

6.0 Water Quality Monitoring Program

ASR regulations require that source water and native groundwater be analyzed for DHS regulated and unregulated constituents, DEQ water quality maximum measurable level (MML) constituents and the federal secondary maximum contaminant level (SMCL) constituents before pilot testing begins and periodically during the testing period. In addition to the above-mentioned constituents, the native groundwater also must be tested for selected general water quality parameters and common ions. These analyses are listed in Table 3 of this application. Results of source water and native groundwater quality testing conducted to date are provided in Appendix B and are discussed in Section 2 of this report.

The objectives of water quality monitoring for the ASR pilot testing program include the following:

- Confirm that the injected and recovered water meets Safe Drinking Water Act drinking water criteria:
  - Drinking water parameters
  - Aesthetics of the recovered water (taste and odor)

- Assess water quality compatibility with respect to:
  - Injection well clogging caused by particulates (turbidity), air, biological activity, and chemical reactions
  - Mineral dissolution reactions in the aquifer that could affect recovered water quality
  - ASR well redevelopment criteria
  - Recovery efficiencies

The components of the water quality monitoring for the pilot testing program are described in the following subsections. A discussion of the background native groundwater quality, source water quality, and predicted geochemistry resulting from mixing is presented in Section 2 of this application.

6.1 Water Quality Monitoring: Year 1 Pilot Testing

Water quality samples will be collected during the injection, storage and recovery periods of Cycle 1 testing. Water quality analyses and a tentative ASR operations schedule for the first year of pilot testing at the LHS irrigation well are presented in Table 2. The program has been designed to meet the objectives stated previously.

6.2 Water Quality Monitoring: Pilot Testing, Years 2 through 5

Table 2 presents the anticipated water quality monitoring program for Years 2 through 5. If this anticipated program changes based on Year 1 pilot testing results, an updated water quality monitoring program for Years 2 through 5 will be developed and submitted to OWRD.

7.0 Quality Assurance and Quality Control Plan

This quality assurance and quality control (QA/QC) plan describes water sampling QA/QC procedures that will be performed during the District's ASR pilot testing program at LHS. The purpose of the QA/QC plan is to obtain water quality data that are valid representations of the water quality at each sampling location. GSI and/or LHS will collect the water quality samples and submit them to a laboratory for analysis. GSI will review field and laboratory data for completeness and compliance with this plan.

7.1 Field QA/QC

QA/QC procedures that will be used in the field during the ASR pilot testing program include field equipment calibration, field record keeping, and chain-of custody documentation. No duplicate samples will be collected in the field. If lab testing results indicate that a parameter has an unexpectedly high concentration approaching the MCL or MML, injection or pumping will be stopped and the location will be resampled as soon as possible. Each element of the field QA/QC is described below.

7.2 Field Equipment Calibration

Field meters require calibration to ensure accurate and precise measurement of field parameters. The field meters will be calibrated before each sampling event and subsequently operated in a manner consistent with the manufacture's recommendations.

7.3 Field Record Keeping

The sampling technician will document field observations and measurements on a water sampling field form during sampling. The following information will be recorded on the form for each sampling point:

- Time of day and date
- Name of person performing the sampling
- Location of sampling point
- Field parameter values (pH, temperature, specific conductivity, dissolved oxygen, and oxygen reduction potential) collected during sampling
- Appearance of sample
- Thermal and chemical preservation (if any)

If groundwater samples are collected from wells, the following additional information will be recorded on the form:

- Depth to groundwater
- Field parameter values collected during purging intervals
- Purging time and volume of water purged

7.4 Sample Labels

A sample label will be secured to each water sample container. The following information will be included on the sample labels:

- Project location
- Sample number (e.g., well ID# and date)
- Name of person collecting the sample
- Date and time of sample collection
- Type of preservative (if any)
- Other pertinent information requested by the analytical laboratory that will be analyzing the water samples

7.5 Sample Names

Each sample will be named according to the following format: LHS- *AAA-BB-C*, where:

- "LHS" indicates the sample was collected at the Liberty High School irrigation well,
- "*AAA*" indicates whether the water represents native basalt groundwater (NBG), source water (SW), or recovered water (RW),
- "*BB*" indicates the cycle (C1 for Cycle 1, C2 for Cycle 2, etc.), and
- "*C*" indicates the sample number within a given cycle (1 indicates the first sample of "*AAA*" collected during a cycle, and 2 indicates the second sample of "*AAA*" collected during a cycle).

For example, LHS-SW-C1-2 would be the second source water sample collected during Cycle 1 at the Liberty High School irrigation well.

7.6 Chain-of-Custody

A chain-of-custody form will be used to track possession of each sample and document the requested analyses. The following procedure will be used regarding chain-of-custody records.

1. After collecting the samples, the sampling technician will complete the chain-of-custody form.

2. The chain-of-custody record will accompany the samples from the field to the laboratory.

3. Each individual having samples in his/her custody must ensure that the samples are not tampered with and that the chain-of-custody record is completed upon sample transfer.

4. A copy of the completed forms will be retained in the project files.

7.7 Laboratory Quality Assurance Program

Samples collected during the pilot testing program will be analyzed by an analytical laboratory certified by the Oregon Environmental Laboratory Accreditation Program (ORELAP).

The analytical laboratory will use trip blanks, method blanks, spikes, duplicates, surrogates, and control samples in each analytical batch containing the District samples

being analyzed, or at a frequency of at least one in every 20 samples, depending on the analysis being performed. The results from these procedures will accompany the sample test results. A copy of the analytical laboratory's quality assurance manual is available upon request.

8.0 Schedule

The anticipated pilot testing schedule for the Liberty High School irrigation well is presented in Table 2. The schedule may vary depending on when the ASR limited license is approved and could change in response to weather conditions that will influence the beginning of peak seasonal irrigation demand and well performance.

9.0 ASR Annual Water Year Report Form

Appendix J contains the report form and description of information that will be used to report the results from pilot testing to OWRD each year. GSI will complete this report form for the District following the first year or two of testing but anticipates that the form will be prepared by the District with help from GSI in subsequent years.

Works Cited

Driscoll, F. G., 1986. Groundwater and Wells. 2nd Ed. Johnson Filtration Systems, St. Paul, Minnesota, 1089 p.

Fetter, C. W., 1994. Applied Hydrogeology. 3rd Ed. Prentice Hall, Upper Saddle River, New Jersey, 691 p.

OAR, 2010. Water Resources Department Division 350 Aquifer Storage and Recovery (ASR) and Artificial Groundwater Recharge 690-350-020. Filed through September 15, 2009. Downloaded by GSI in February 2010.

Tolan, T. L., and M. H. Beeson, 1986. Geologic Log for Site WASH 5586. Available online at: http://or.water.usgs.gov/projs_dir/crbg/. Downloaded by GSI in March 2010.

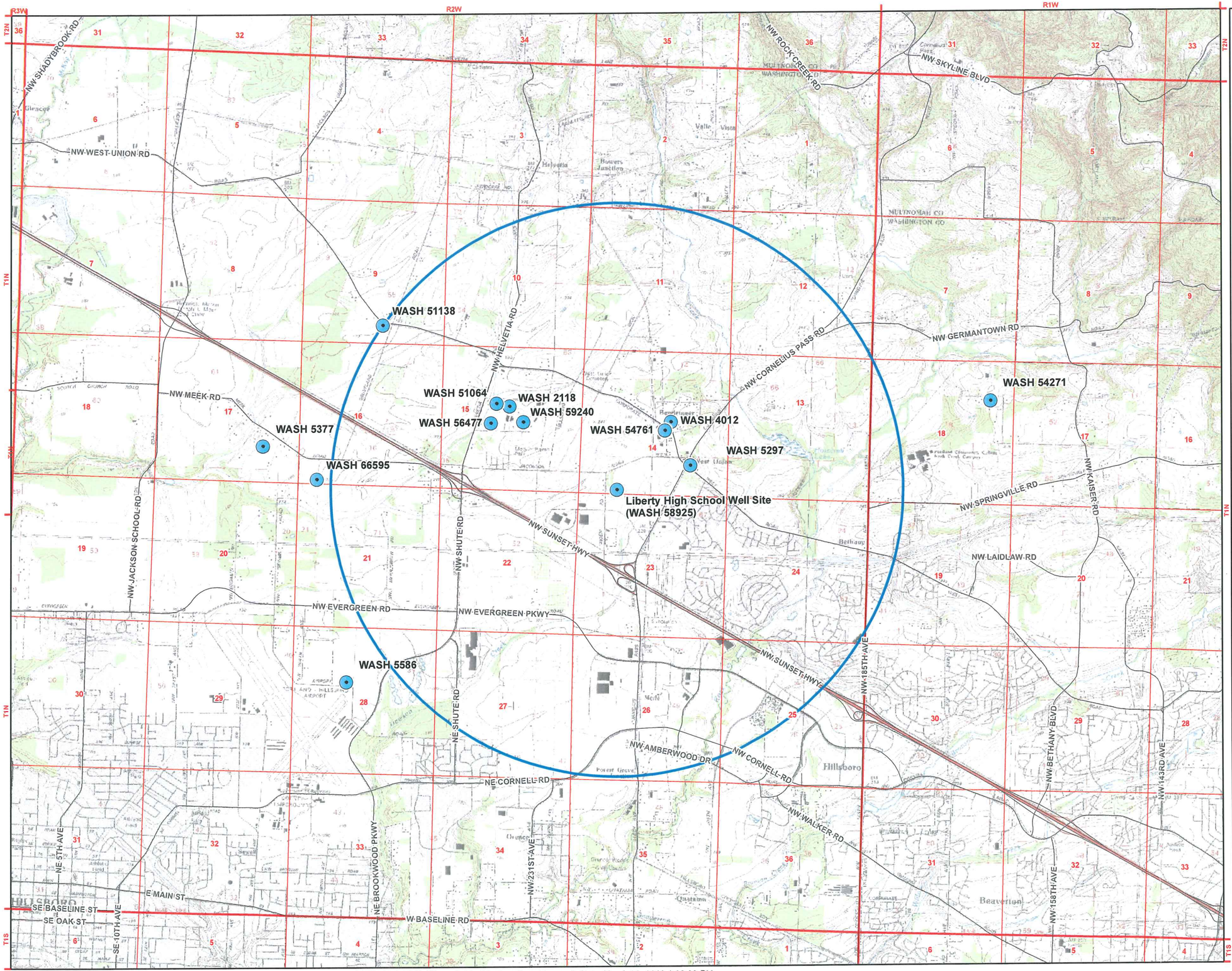
Tolan, T. L., 2000.

FIGURES

FIGURE 1

Site Location Map

Hillsboro School District
Liberty High School ASR Evaluation



LEGEND

- Wells
- 2 Mile Radius
- Major Roads

N

Scale
1:42,000

0 1750 3500 5250 7000

1 inch equals 3,500 feet

MAP NOTES:
Projection: Oregon State Plane North
Datum: North American Datum 1983
Date: March 22, 2010
Data Sources: OWRD, USGS

GSI Water Solutions, Inc.

File Path: P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Project_GIS\Project_MXDs\Figure1_LL_Site_Location_Map.mxd, Date: March 22, 2010 1:38:33 PM

FIGURE 2

Site Map with Vicinity Water Wells

Hillsboro School District
Liberty High School ASR Evaluation

LEGEND

- Wells
- Roads
- Watercourses

N

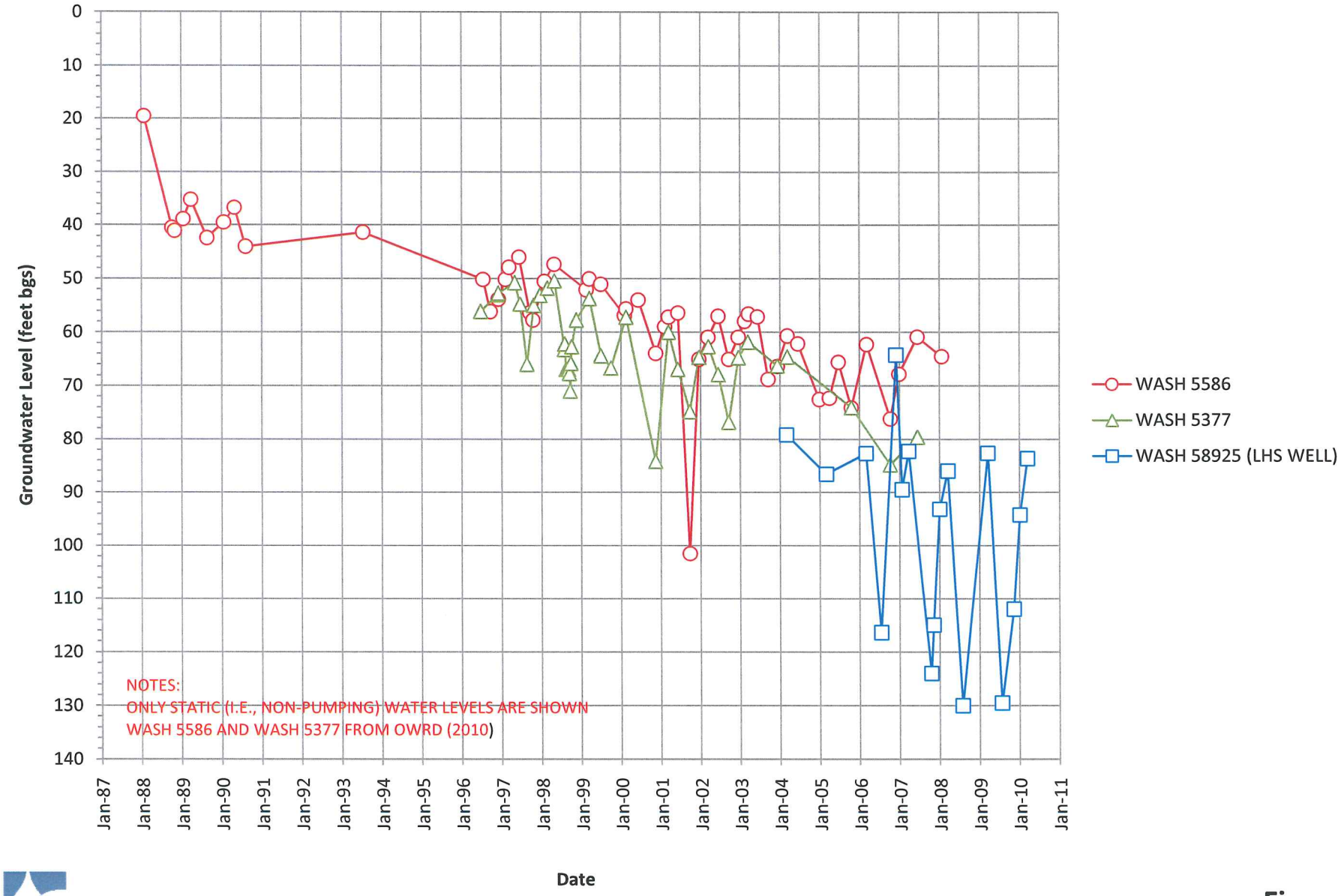
Scale
1:15,840

0 0.125 0.25 0.375 0.5
1 inch equals 0.25 miles

MAP NOTES:
Projection: Oregon State Plane North
Datum: North American Datum 1983
Date: April 6, 2010
Data Sources: OWRD, USGS

GSI Water Solutions, Inc.

File Path: P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Project_GIS\Project_MXDs\Figure2_LL_Site_Map.mxd, Date: March 22, 2010 1:39:56 PM



GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Data\Water Levels\Hydrographs

Figure 3

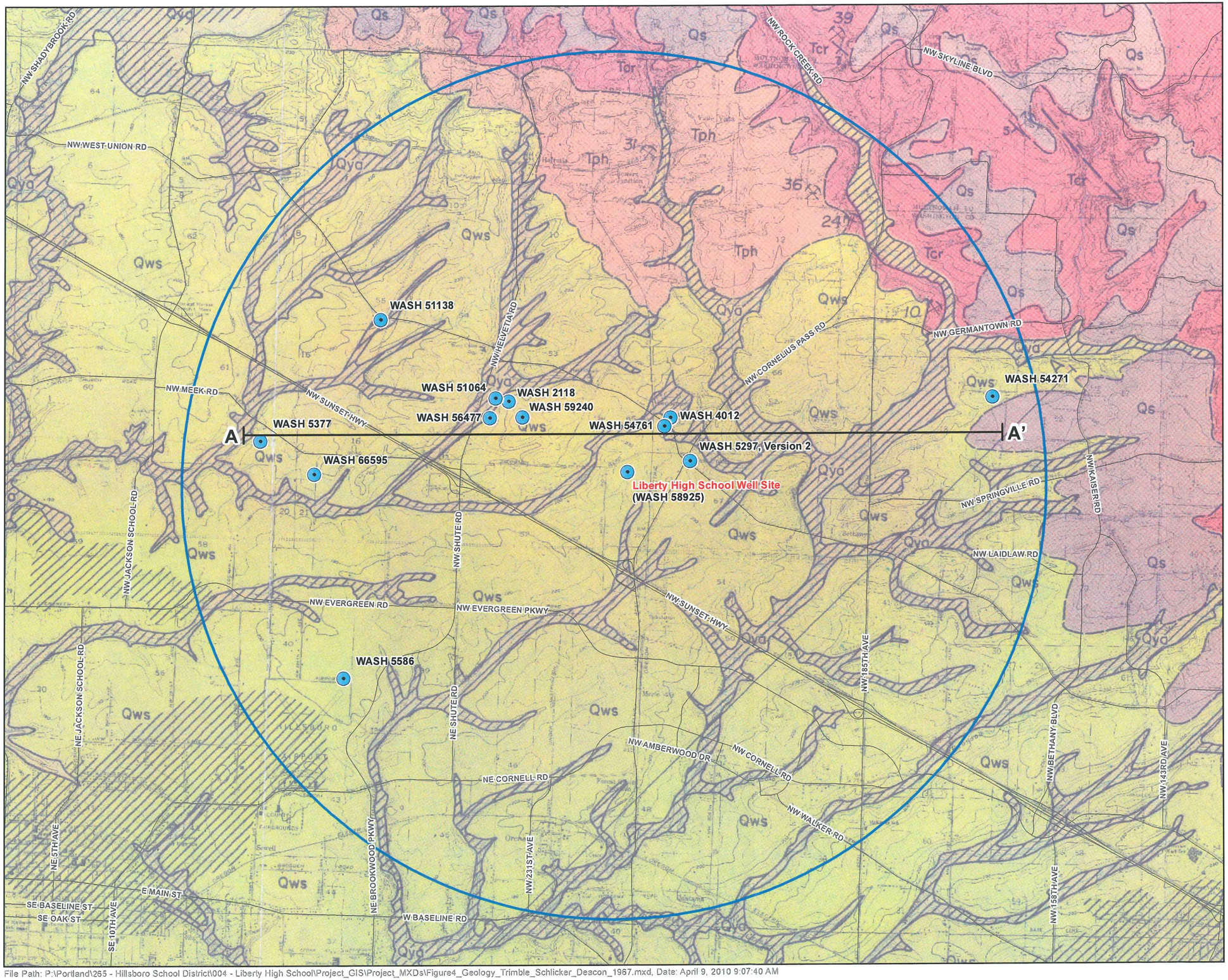
Basalt Well Hydrographs

LHS Limited License Application

FIGURE 4

Geologic Map

Hillsboro School District
Liberty High School ASR Evaluation



LEGEND

- Wells
- Cross Section A-A'
- 3 Mile Radius
- Major Roads

Geology (from Trimble, Schlicker, and Deacon 1967)

- Qya - Young Alluvium
- Qws - Willamette Silt
- Qs - Upland Silt
- Tph - Helvetia Formation (sand, silt, and clay)
- Tcr - Columbia River Basalt

N

Scale
1:42,000

0 1750 3500 5250 7000

1 inch equals 3,500 feet

MAP NOTES:
Projection: Oregon State Plane North
Datum: North American Datum 1983
Date: April 9, 2010
Data Sources: OWRD, USGS

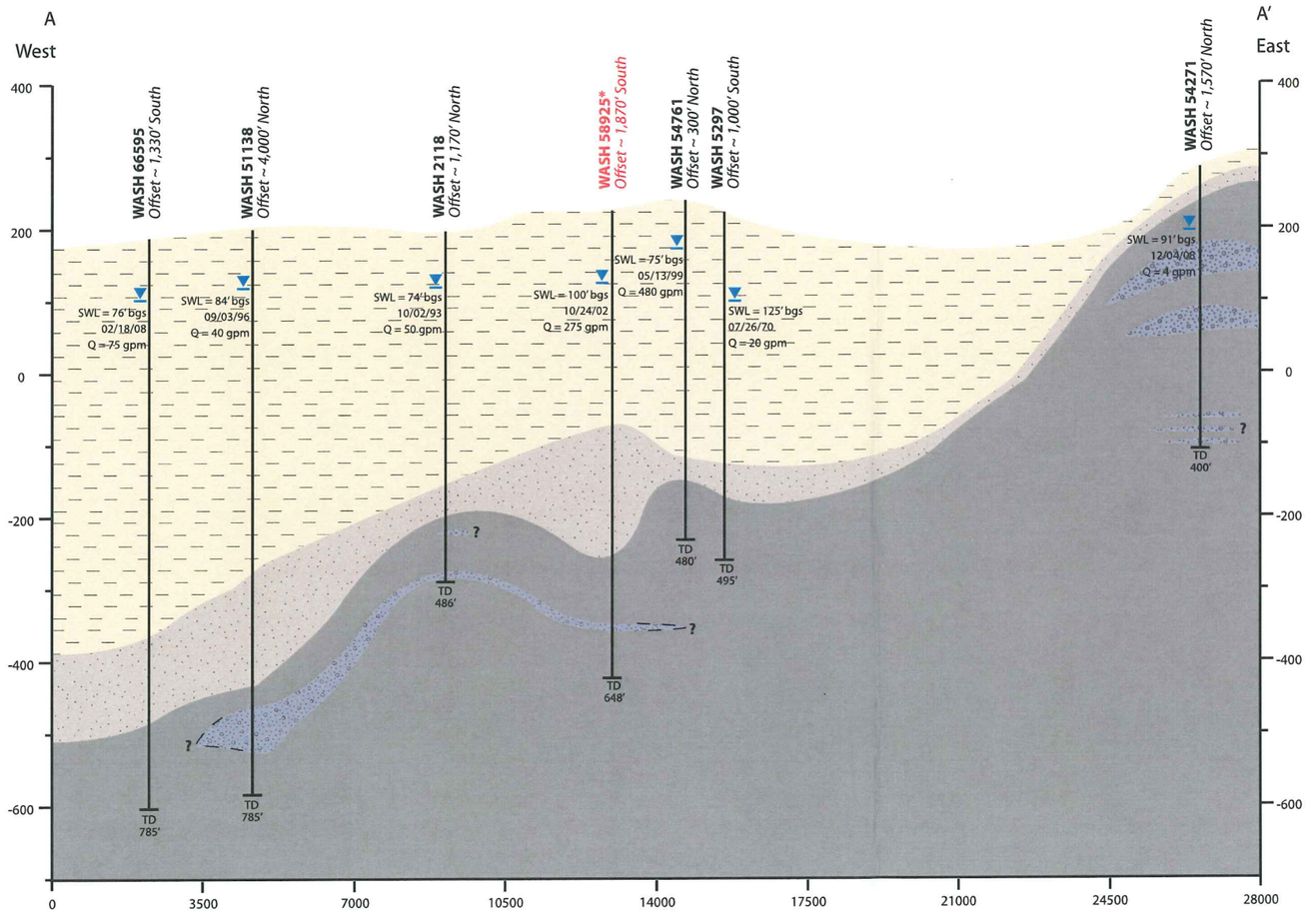
GSI Water Solutions, Inc.

File Path: P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Project_GIS\Project_MXDs\Figure4_Geology_Trimble_Schlicker_Deacon_1967.mxd, Date: April 9, 2010 9:07:40 AM

FIGURE 5

Cross Section A - A'

Hillsboro School District
Liberty High School ASR Evaluation



LEGEND

- Clay or Silt
- Decomposing or Soft Brown Basalt
- Firm or Hard Gray-Black Basalt
- Interflow Zone
- Static Water Level

NOTES

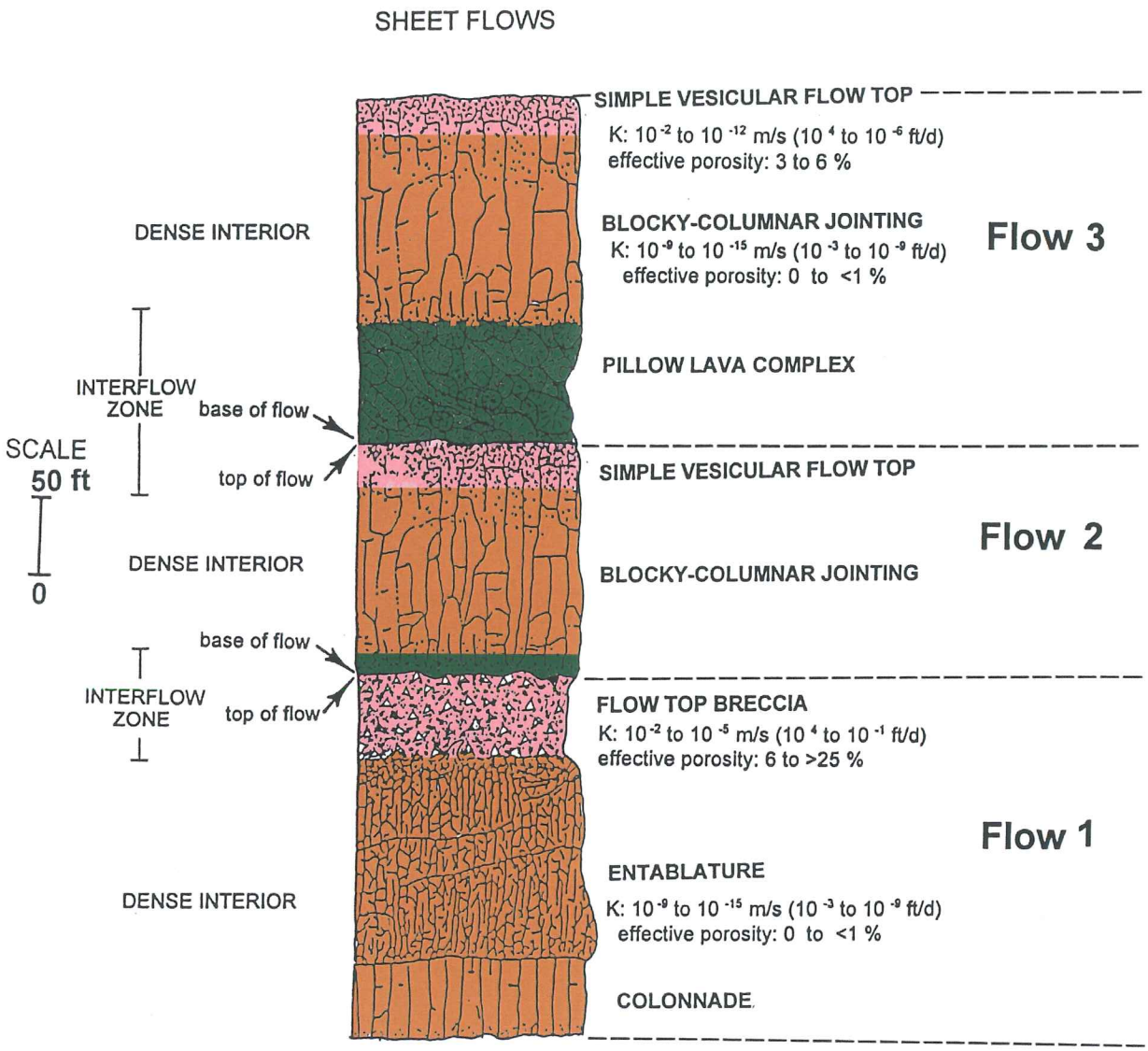
* Liberty High School Well
SWL - Static Water Level
BGS - Below Ground Surface
GPM - Gallons per Minute
TD - Total Depth

Scale

200 feet
17.5x Vertical Exaggeration
3,500 feet

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures



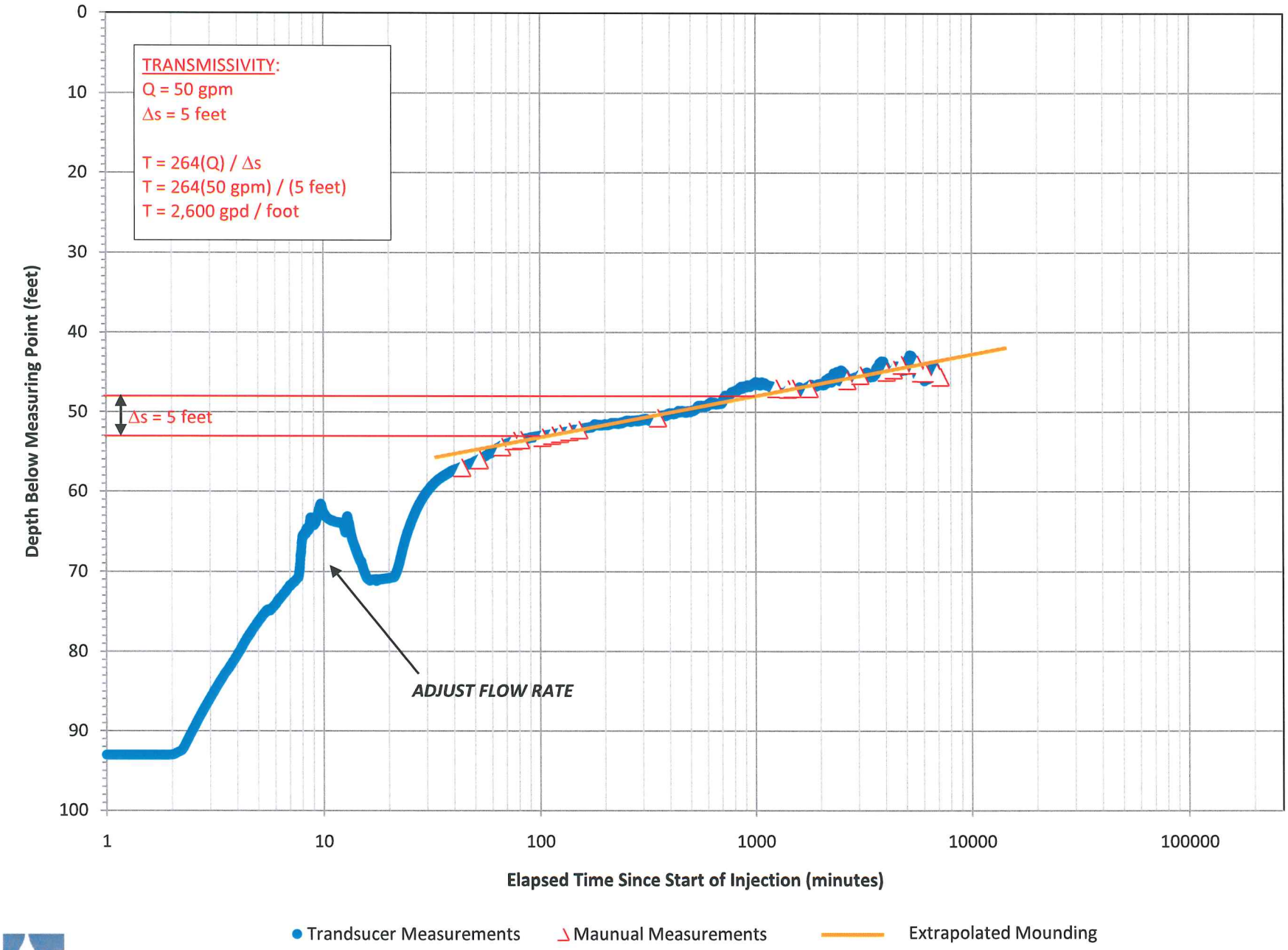
Diagrammatic representation of common Columbia River Basalt Group (CRBG) intraflow structure and terminology. Flow tops are highlighted in pink, dense interiors in orange, and flow bottoms in green. From Tolan et al. (2000)

K= represents a bulk hydraulic conductivity value

FIGURE 6

CRBG Geomorphology and Hydraulic Properties

GSI Water Solutions, Inc.



GSI Water Solutions, Inc.

FIGURE 7

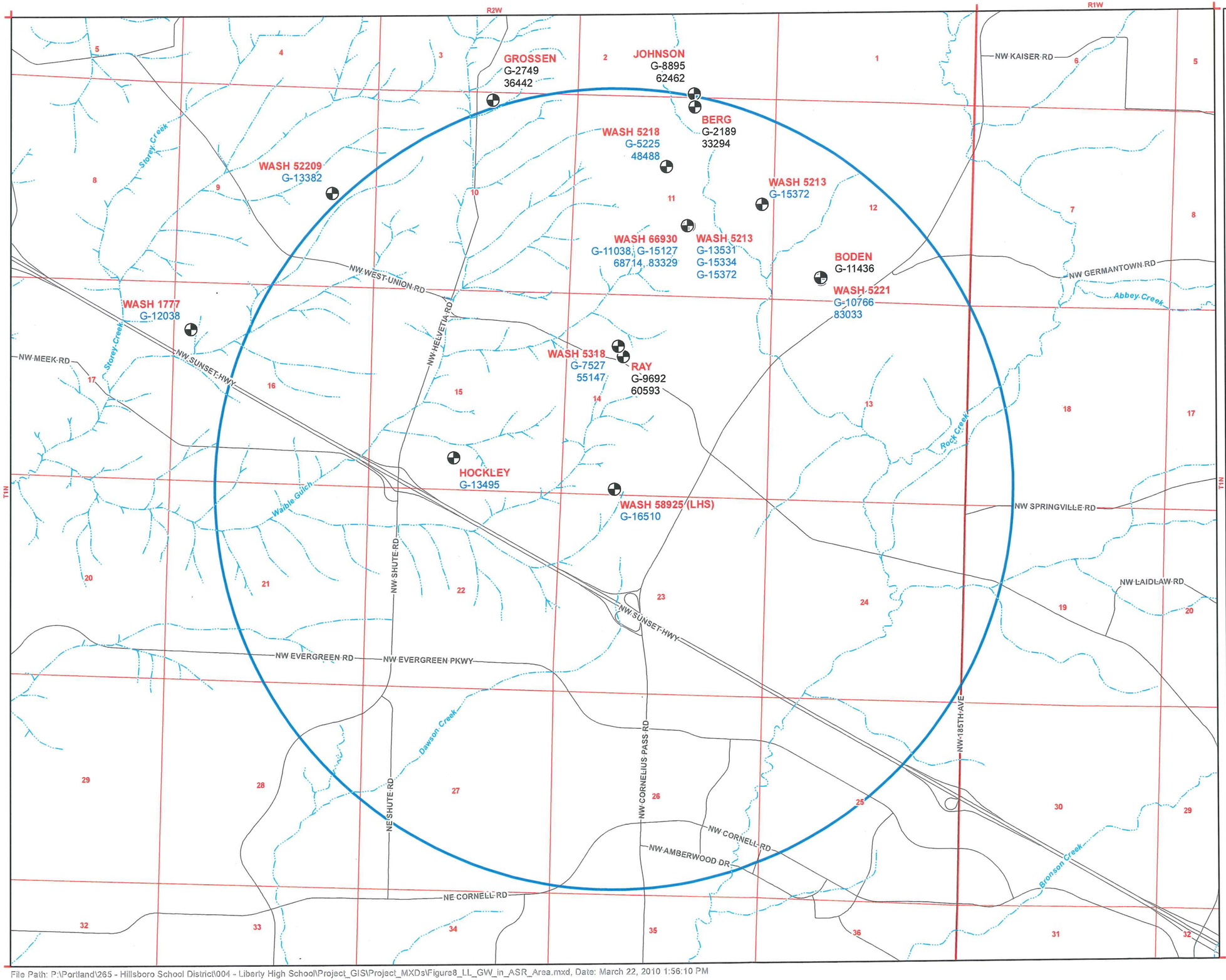
Time - Mounding Plot

Hillsboro School District LHS ASR Evaluation

FIGURE 8

Allocation of Groundwater in Area Affected by ASR

Hillsboro School District
Liberty High School ASR Evaluation



LEGEND

- Groundwater Point of Appropriation
- Area Affected by ASR (2 Mile Radius)
- Major Roads
- Watercourses

NOTES
Blue text indicates well aquifer is basalt.
Black text indicates well aquifer is unknown.

N

Scale
1:30,000

0 1250 2500 3750 5000
1 inch equals 2,500 feet

MAP NOTES:
Projection: Oregon State Plane North
Datum: North American Datum 1983
Date: March 22, 2010
Data Sources: OWRD, USGS

GSI Water Solutions, Inc.

File Path: P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Project_GIS\Project_MXDs\Figure8_LL_GW_in_ASR_Area.mxd, Date: March 22, 2010 1:56:10 PM

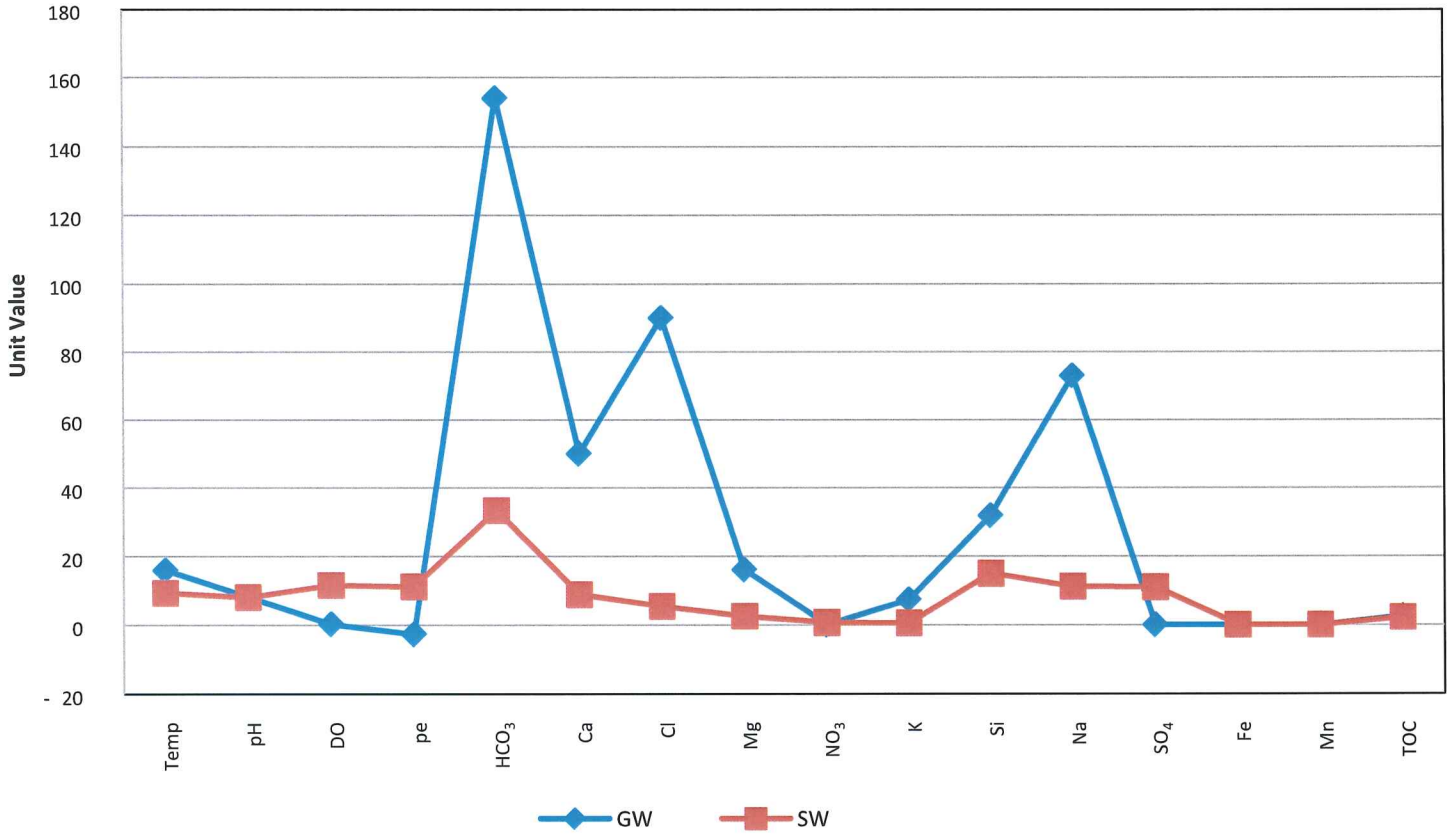


FIGURE 9

Chemical Parameters

Hillsboro School District
Liberty High School
ASR Evaluation

NOTES

Temperature is in degrees centigrade, concentrations are in mg/L (ppm).

GW = Native Basalt Groundwater
SW = TVWD Source Water
TVWD = Tualatin Valley Water District
DO = Dissolved Oxygen
Pe = 0.017 x ORP
ORP = Oxidation Reduction Potential
HCO_3 = Bicarbonate
Ca = Calcium
Cl = Chloride
Mg = Magnesium
NO_3 = Nitrate
K = Potassium
Si = Silica
Na = Sodium
SO_4 = Sulfate
Fe = Iron
Mn = Manganese
TOC = Total Organic Carbon

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures

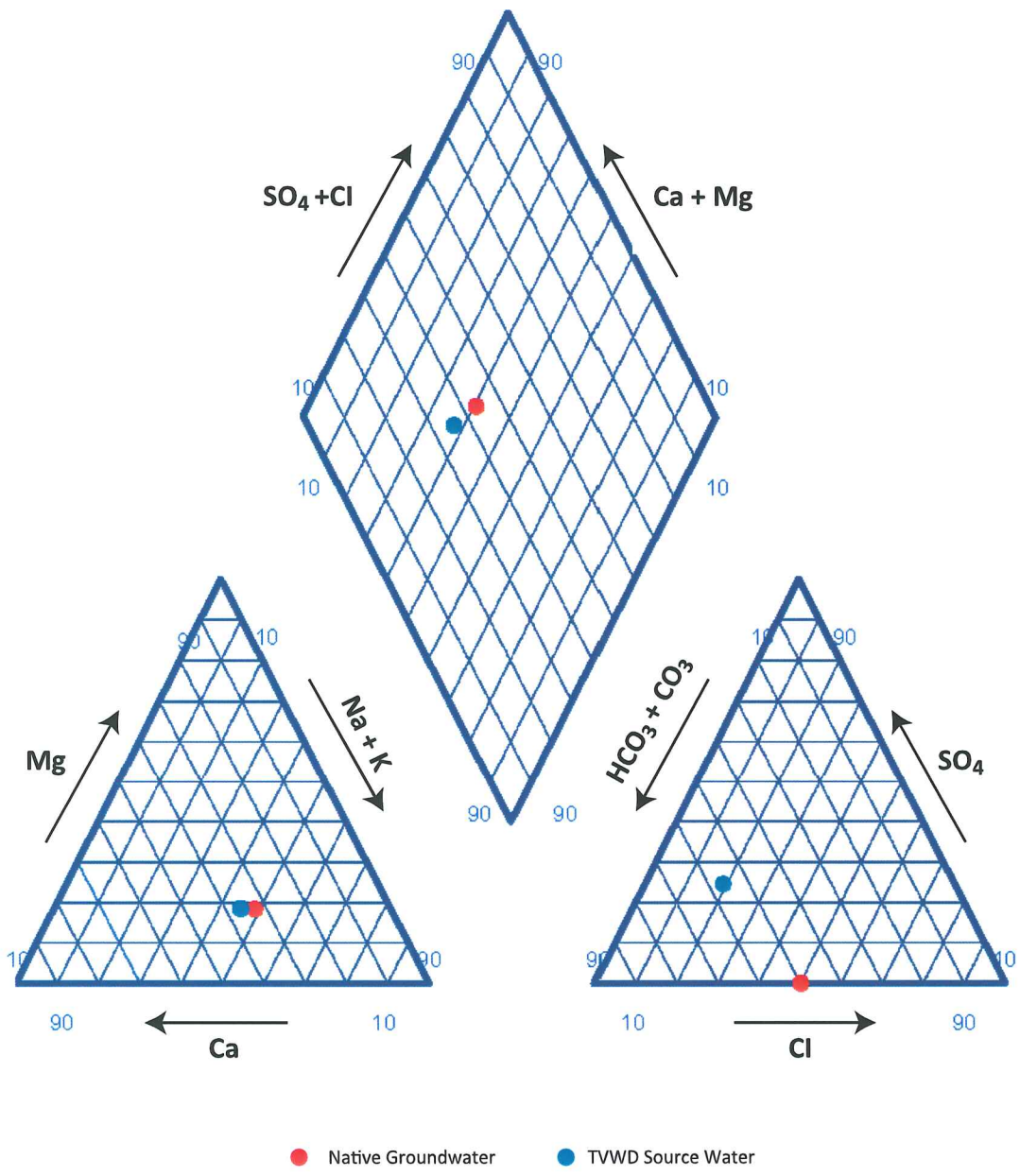


FIGURE 10

Piper Plot

Hillsboro School District
Liberty High School
ASR Evaluation

NOTES

Compositional character of the native groundwater (red) and the TVWD source water (blue).

TVWD = Tualatin Valley Water District
HCO_3 = Bicarbonate
Ca = Calcium
Cl = Chloride
Mg = Magnesium
K = Potassium
Na = Sodium
SO_4 = Sulfate
CO_3 = Carbonate

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures

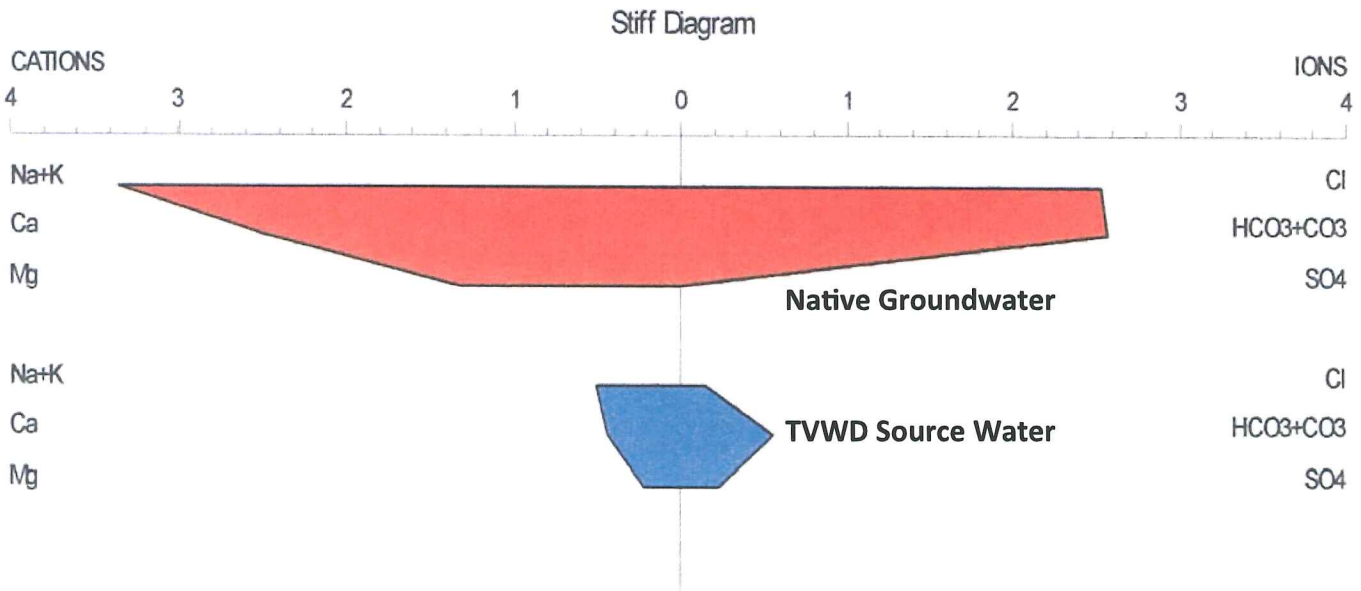


FIGURE 11

Stiff Diagram

Hillsboro School District
Liberty High School
ASR Evaluation

NOTES

Compositions are plotted as equivalents. An equivalent is the number of moles of an element that will contribute the same number of moles of charge (e.g., one mole of Na+ or K+ will contribute one mole of charge, whereas only 0.5 moles of Ca++ and Mg++ are necessary to contribute one mole of charge).

TVWD = Tualatin Valley Water District
HCO_3 = Bicarbonate
Ca = Calcium
Cl = Chloride
Mg = Magnesium
K = Potassium
Na = Sodium
SO_4 = Sulfate
CO_3 = Carbonate

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures

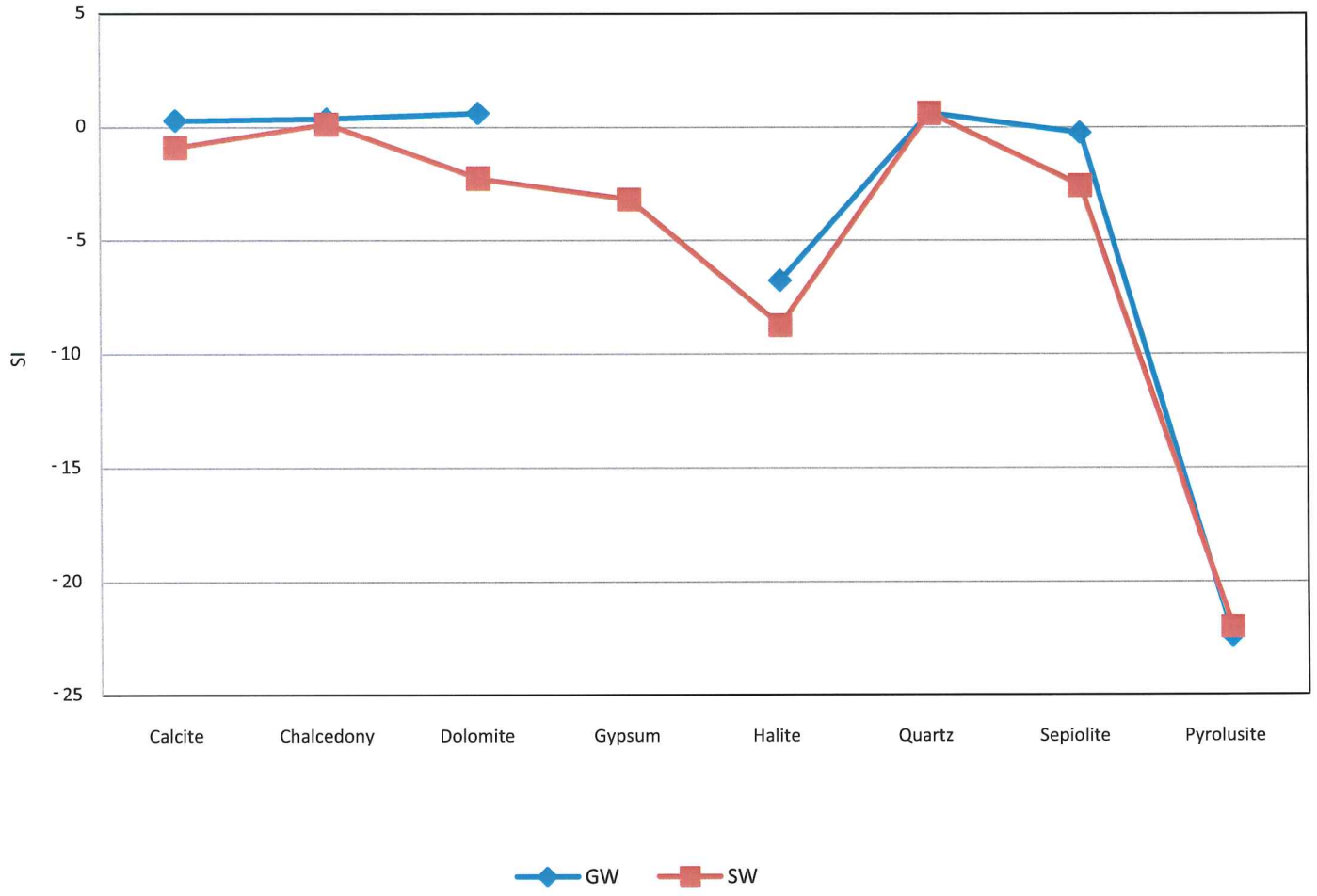


FIGURE 12

Saturation Indices for Native Groundwater and TVWD Source Water

Hillsboro School District
Liberty High School
ASR Evaluation

NOTES

Native groundwater (GW) and TVWD source water (SW). The saturation index is the log of the ratio of the observed concentration of mineral components within the water to the theoretical concentrations in the water when the solution is saturated with respect to the mineral. Note that SO4 was reported as non-detect in the native groundwater analysis and therefore no value is available for gypsum SI for this water.

TVWD = Tualatin Valley Water District

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures

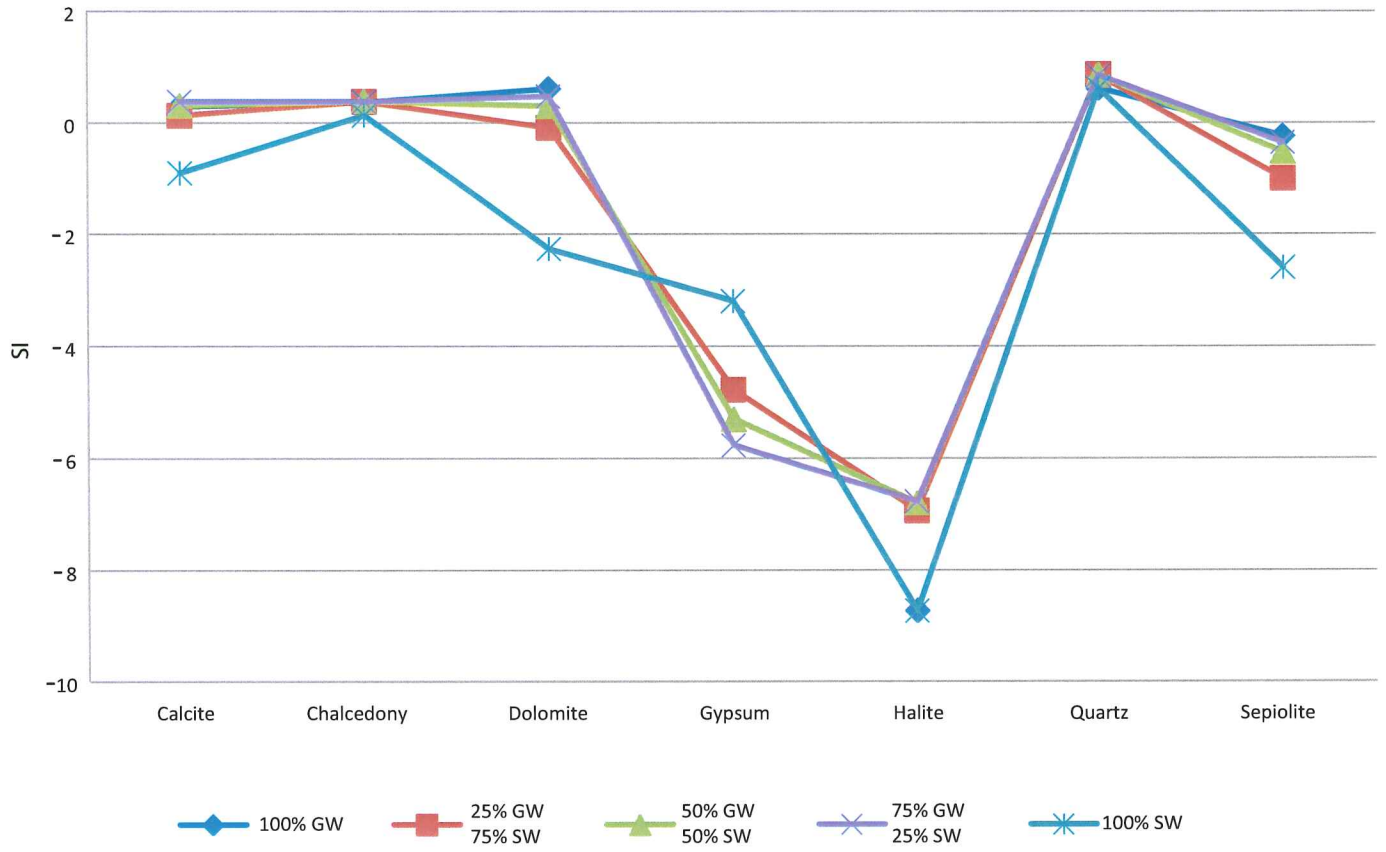


FIGURE 13

Saturation Indices for Mixed Waters

Hillsboro School District
Liberty High School
ASR Evaluation

NOTES

Saturation indices for common minerals in the native groundwater and the TVWD source water, and mixtures of the two waters, consisting of 25%, 50%, and 75% of groundwater in the mixture.

TVWD = Tualatin Valley Water District
SW = Source Water
GW = Groundwater

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures

TABLES

Table 1
Water Quality Results
Hillsboro School District - Liberty High School

Class	Analyte	Lowest Regulatory Standard	Units	Regulatory Criteria	WASH 58925 Liberty HS 1/11/2010		TVWD SW HNSN-C12SW-1 12/16/2008		TVWD SW HNSN-C12SW-3 4/13/2009	
Field Parameters	Temperature	None	Celsius	None	13.3		7.82		9.4	
	Conductivity	None	mS/cm	None			132		114	
	pH	6 - 8.5	Units	SMCL	8.09		8.3		8	
	DO		mg/L		0.22		12.37		10.88	
	ORP	None	mV	None	-159.4		676		658	
Bacteriological	Fecal Coliforms/E.Coli									
	Total Coliform	<1/100 ML	CFU/100 ml	MML						
Disinfection By-Products	Chloroform	None	mg/L	URC			0.022			
	Bromodichloromethane	None	mg/L	None			0.0037			
	Dibromochloromethane	None	mg/L	None			0.001	U		
	Bromoform	None	mg/L	URC			0.001	U		
	Total Trihalomethanes	0.08	mg/L	MCL			0.0257			
	Monochloroacetic Acid	None	mg/L	None			0.002	U		
	Dichloroacetic Acid	None	mg/L	None			0.0133			
	Trichloroacetic Acid	None	mg/L	None			0.0136			
	Monobromoacetic Acid	None	mg/L	None			0.001	U		
	Dibromoacetic Acid	None	mg/L	None			0.001	U		
	Total Haloacetic Acids	0.06	mg/L	MCL			0.0269			
Geochemical	Bicarbonate	None	mg/L	None	154		39		28	
	Calcium	None	mg/L	None	50		10		7.7	
	Carbonate	None	mg/L	None	2	U	2	U	2	U
	Chloride	250	mg/L	SMCL	90		7		4	
	Hardness (as CaCO3)	250	mg/L	SMCL	172		40		30	
	Magnesium	None	mg/L	None	16.1		2.93		2.26	
	Nitrate as N	10	mg/L	MML	0.5	U	0.7		0.8	
	Nitrite as N	1	mg/L	MCL	0.01	U	0.01	U	0.01	U
	Total Nitrate-Nitrite	10	mg/L	MML	0.01	U	0.7		0.8	
	Potassium	None	mg/L	None	7.4		0.6		0.5	
	Silica	None	mg/L	None	32		15		15	
	Sodium	20	mg/L	URC, SMCL	**73**		12.3		10.1	
	Sulfate	250	mg/L	URC, SMCL	1	U	13		9	
	Total Alkalinity	250	mg/L	SMCL	154		39		28	
	Total Dissolved Solid	500	mg/L	SMCL	396		97		72	
	Total Organic Carbon	None	mg/L	None	2.55		1.75		2.55	
	Total Suspended Solids	None	mg/L	None	2		2	U	2	U
Metals	Aluminum	0.05	mg/L	SMCL	**0.1**		0.05	U	**0.18**	
	Antimony	0.006	mg/L	MCL	0.001	U	0.001	U	0.001	U
	Arsenic	0.05	mg/L	MCL, MML	0.003	U	0.003	U	0.003	U
	Barium	1	mg/L	MCL, MML	0.06		0.05	U	0.05	U
	Beryllium	0.004	mg/L	MCL	0.002	U	0.001	U	0.001	U
	Cadmium	0.005	mg/L	MCL, MML	0.0005	U	0.0005	U	0.0005	U
	Chromium	0.05	mg/L	MCL, MML	0.01	U	0.01	U	0.01	U
	Copper	1.3	mg/L	MCL	0.05	U	0.05	U	0.05	U
	Iron (Total)	None	mg/L	None	0.1	U	0.05	U	0.05	U
	Iron (Dissolved)	0.3	mg/L	SMCL	0.1	U	0.05	U	0.05	U
	Lead	0.015	mg/L	MCL, MML	0.002	U	0.002	U	0.002	U
	Manganese (Total)	None	mg/L	None	0.02	U	0.02	U	0.02	U
	Manganese (Dissolved)	0.05	mg/L	SMCL	0.02	U	0.02	U	0.02	U
	Mercury	0.002	mg/L	MCL, MML	0.003	U	0.0003	U	0.0003	U
	Nickel	0.1	mg/L	MCL	0.02	U	0.02	U	0.02	U
	Selenium	0.01	mg/L	MCL, MML	0.005	U	0.005	U	0.005	U
	Silver	0.05	mg/L	MML, SMCL	0.02	U	0.02	U	0.02	U
	Thallium	0.002	mg/L	MCL	0.001	U	0.001	U	0.001	U
	Zinc	5	mg/L	SMCL	0.01	U	0.01	U	0.05	U
Miscellaneous	Odor	3	TON	SMCL	1		1		2	
	Color	15	ACU	SMCL	5	U	5		5	U
	Methylene Blue Active	0.5	mg/L	SMCL	0.05	U	0.05	U	0.05	U
	Corrosivity (Langelier Saturation Index)	Non-Corrosive	mg/L	SMCL	-0.36		-0.59		-2.05	
	Cyanide (as free cyanide)	0.2	mg/l	MCL	0.02	U	0.02	U	0.02	U
	Fluoride	2	mg/L	MCL, MML,	0.5	U	0.9		0.9	
Radionuclides	Combined Radium 226/228 [1]	5	pCi/L	MCL						
	Uranium [1]	0.03	mg/L	MCL			0.001	U		
	Gross Alpha	15	pCi/L	MCL			0.9			
	Beta/Photon emitters [2]	4	mrem/yr	MCL						
	Gross Beta	50	pCi/L	MML			1.5	U		
	I - 131 [3]	3	pCi/L	MML						
	Sr-90 [3]	8	pCi/L	MML						
	Tritium [3]	20	pCi/L	MML						
Regulated Synthetic Organic Compounds (SOCs)	2,4,5-TP (Silvex)	0.01	mg/L	MCL, MML			0.0004	U		
	2,4-D	0.07	mg/L	MCL, MML			0.0002	U		
	Alachlor (Lasso)	0.002	mg/L	MCL, MML			0.004	U		
	Atrazine	0.003	mg/L	MCL, MML			0.002	U		
	Benzo(a)Pyrene	0.0002	mg/L	MCL			0.00004	U		
	BHC-gamma (Lindane)	0.0002	mg/L	MCL, MML			0.0002	U		
	Carbofuran	0.04	mg/L	MCL			0.001	U		
	Chlordane	0.002	mg/L	MCL			0.00004	U		
	Dalapon	0.2	mg/L	MCL			0.002	U		
	Di(2-ethylhexyl)adipate	0.4	mg/L	MCL			0.001	U		
	Di(2-ethylhexyl)phthalate	0.006	mg/L	MCL, MML			0.001	U		
	Dibromochloropropane	0.0002	mg/L	MCL			0.00002	U		
	Dinoseb	0.007	mg/L	MCL			0.0004	U		
	Diquat	0.02	mg/L	MCL			0.0004	U		
	Ethylene Dibromide (EDB)	0.00005	mg/L	MCL, MML			0.00001	U		
	Endothall	0.1	mg/L	MCL			0.01	U		
	Endrin	0.0002	mg/L	MCL, MML			0.00002	U		
	Glyphosate	0.7	mg/L	MCL, MML			0.01	U		
	Heptachlor	0.0004	mg/L	MCL, MML			0.00004	U		
	Heptachlor Epoxide	0.0002	mg/L	MCL, MML			0.00002	U		
	Hexachlorobenzene (HCB)	0.001	mg/L	MCL, MML			0.0001	U		
	Hexachlorocyclopentadiene	0.05	mg/L	MCL, MML			0.0002	U		
	Methoxychlor	0.04	mg/L	MCL, MML			0.0002	U		
	Polychlorinated Biphenyls	0.0005	mg/L	MCL, MML			0.00002	U		
	Pentachlorophenol	0.001	mg/L	MCL, MML			0.00008	U		
	Picloram	0.5	mg/L	MCL, MML			0.0002	U		
	Simazine	0.004	mg/L	MCL, MML			0.0001	U		
	Toxaphene	0.003	mg/L	MCL, MML			0.0001	U		
	Vydate (Oxamyl)	0.2	mg/L	MCL			0.002	U		
Regulated Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	0.2	mg/L	MCL, MML			0.0005	U		
	1,1,2-Trichloroethane	0.005	mg/L	MCL, MML			0.0005	U		
	1,1-Dichloroethylene	0.007	mg/L	MCL, MML			0.0005	U		
	1,2,4-Trichlorobenzene	0.07	mg/L	MCL, MML			0.0005	U		
	1,2-Dichlorobenzene (o)	0.6	mg/L	MCL, MML			0.0005	U		
	1,2-Dichloroethane (EDC)	0.005	mg/L	MCL, MML			0.0005	U		
	1,2-Dichloropropane	0.005	mg/L	MCL, MML			0.0005	U		
	1,4-Dichlorobenzene (p)	0.075	mg/L	MCL, MML			0.0005	U		
	Benzene	0.005	mg/L	MCL, MML			0.0005	U		
	Carbon Tetrachloride	0.005	mg/L	MCL, MML			0.0005	U		
	Chlorobenzene	0.1	mg/L	MCL, MML			0.0005	U		
	cis-1,2-Dichloroethylene	0.07	mg/L	MCL, MML			0.0005	U		
	Ethylbenzene	0.7	mg/L	MCL, MML			0.0005	U		
	Dichloromethane	0.005	mg/L	MCL, MML			0.0005	U		
	Styrene	0.1	mg/L	MCL, MML			0.0005	U		
	Tetrachloroethylene	0.005	mg/L	MCL, MML			0.0005	U		
	Toluene	1	mg/L	MCL, MML			0.0005	U		
	trans-1,2-Dichloroethylene	0.1	mg/L	MCL, MML			0.0005	U		
	Trichloroethylene	0.005	mg/L	MCL, MML			0.0005	U		
	Vinyl Chloride	0.002	mg/L	MCL, MML			0.0005	U		
	Total Xylenes	10	mg/L	MCL, MML			0.0015	U		

NOTE

MDL = Method Detection Limit
NA = Not Applicable
U = Constituent not detected above the method detection limit
mS/cm = millisiemens per centimeter
mg/L = milligrams per liter
HS = High School
mV = millivolts
CFU/ml = colony forming units per milli
TON = Threshold Odor Number
ACU = Apparent Color Units
pCi/L = picoCuries per liter
NBG = Native Basalt Groundwater
mrem/year = millirem per year
MCL = Maximum Contaminant Limit
MML = Maximum Measureable Level
SMCL = Secondary Maximum Contaminant Level
SW = Source Water

Samples are unfiltered unless noted (i.e., dissolved)
1 = Combined Radium 226/228 and Uranium required after December 2003
2 = Only need to analyze if in a vunerable area per OAR 333-61-0036, 6(b)(A) (i.e., near man-made radioactive sources, such as nuclear facilities - currently only selected systems along Columbia River classified as vunerable
3 = These compounds would be analyzed if Gross Alpha or Beta exceed an MCL.
i = Major cation and anion charge balance not compliant with QC requirement of 5%
Bold = Concentration exceeds the lowest standard

Table 2

Water Quality Analyses and ASR Operations Schedule -- Year 1 Pilot Testing

Hillsboro School District - Liberty High School

Modified 3/22/2010 MK

				Estimated -- QA needed	
				Previous Year Carryover	
AVERAGE Injection Rate:		50	(gpm)	0	
AVERAGE Recovery Rate:		240	(gpm)		
Target Storage Volume		13,000,000	(gallons)		
Injection Start Date	(Cycle 1)	Monday 11/1/2010 12:00 AM			
Injection End Date	(Cycle 1)	Saturday 4/30/11 1:20 PM			
Elapsed Injection Days	(Cycle 1)		180.6	(days)	
Elapsed Injection Hours	(Cycle 1)		4333	(hours)	
		Target	13,000,000	gallons injected at injection rate	
Total Planned Injection Volume			13,000,000	gallons Total with Carryover	
Storage Start Date	(Cycle 1)	Saturday 4/30/11 1:20 PM			
Storage End Date	(Cycle 1)	Friday 7/1/11 1:20 PM			
Elapsed Storage Days	(Cycle 1)		62.0	(days)	
Elapsed Storage Hours	(Cycle 1)		1488	(hours)	
Total Planned Recovery Volume			13,000,000	(gallons)	
Recovery Start Date		Friday 7/1/11 1:20 PM		100%	Recovered
Days Required to Recover 100% of Injection Volume		Monday 8/8/11 4:06 AM			
Days Required to Recover Planned Volume		37.6	(days)		

Water Quality Monitoring Program (Cycle 1)

Water Type	Progress Point	Estimated Date	Elapsed Days	Analyte Group	Sample ID (s)	Date (s) Collected	Bottles Verified?	Bottle Order Code
Baseline								
GW	-	SUMMER 2010	-	A, B, **C**, **D**, **E**, F, G H	Liberty HS	1/11/2010 SUMMER 2010 (PLANNED)		
Source	-	COMPLETED	-	**A**, **B**, **C**, **D**, **E**, **F**, **G**, **H**	HNSN-C12SW-1 HNSN-C12SW-3	12/16/2008 4/13/2009		
Injection Period								
Source	0%	Monday 11/1/10 12:00 AM	0	B, C, D	LHS-SW-C1-1			
Source	50%	Sunday 1/30/11 6:40 AM	90	B, C, D	LHS-SW-C1-2			
Source	100%	Saturday 4/30/11 1:20 PM	181	B, C, D	LHS-SW-C1-3			
Storage Period								
Stored	100%	Friday 7/1/11 1:20 PM	62	A, B, C, D, E, F, G, H	LHS-RW-C1-1			
Recovery Period								
Recovered	50%	Wednesday 7/20/11 8:43 AM	19	B, C, D	LHS-RW-C1-2			
Recovered	75%	Friday 7/29/11 6:25 PM	28	B, C, D	LHS-RW-C1-3			
Recovered	95%	Saturday 8/6/11 6:58 AM	36	B, C, D	LHS-RW-C1-4			

Water Quality Monitoring Program (Subsequent Cycles)

Water Type	Progress Point	Estimated Date	Elapsed Days	Analyte Group	Sample ID (s)	Date (s) Collected	Bottles Verified?	Bottle Order Code
Injection Period								
Source	0%	Monday 11/1/10 12:00 AM	0	A, B, C, D, E, F, G, H	LHS-SW-C2-1			
Source	50%	Sunday 1/30/11 6:40 AM	90	A, B, C, D	LHS-SW-C2-2			
GW	0%	Monday 11/1/10 12:00 AM	0	A, B, C, D	LHS-NBG-C2-2			
Storage Period								
Stored	100%	Friday 7/1/11 1:20 PM	62	A, B, C, D, E, F, G, H	LHS-RW-C2-1			
Recovery Period								
Recovered	50%	Wednesday 7/20/11 8:43 AM	19	A, B, C, D	LHS-RW-C2-2			

Notes: If storage period is less than 30 days, then collect storage sample immediately prior to recovery
Spreadsheet is based on average injection rates, recovery rates, and storage volumes.
Analyte Group (refer to Table 7 for complete list) (**BOLD** indicates analysis has been completed)
A = Bacteriological
B = Field Parameters
C = Geochemical
D = Metals
E = Miscellaneous
F = Radionuclides
G = Synthetic Organic Compounds
H = Volatile Organic Compounds
* Includes carryover from previous year

Table 3

Required Analyses for Native Groundwater and Source Water

Hillsboro School District - Liberty High School

Group	Analyte	Unit	Criteria	ASR Standards*	Note
(A) Bacteriological	Coliform Bacteria	/100ml	MML	0.5	
	Total Coliforms (including fecal coliform and E. Coli)	%	MCL	2.5	1
(B) Field Parameters	Dissolved Oxygen	mg/L	None	--	
	ORP	mv	None	--	
	pH	--	SMCL	6.5-8.5	
	Specific Conductance	us/cm	None	--	
	Temperature	Celcius	None	--	
	Turbidity	NTU	MML	0.5	
(C) Geochemical	Bicarbonate	mg/L	None	--	
	Calcium	mg/L	None	--	
	Carbonate	mg/L	None	--	
	Chloride	mg/L	SMCL	250	
	Hardness as CaCO3	mg/L	None	--	
	Magnesium	mg/L	None	--	
	Nitrate (measured as Nitrogen)	mg/L	MCL	5	
	Nitrite (measured as Nitrogen)	mg/L	MCL	0.5	
	Potassium	mg/L	None	--	
	Silica	mg/L	None	--	
	Sodium	mg/L	None	--	
	Sulfate	mg/L	SMCL	250	
	Total Alkalinity as CaCO3	mg/L	None	--	
	Total Dissolved Solids	mg/L	SMCL	500	
	Total Organic Carbon	mg/L	None	--	
(D) Metals	Aluminum	mg/L	SMCL	0.05 - 0.2	
	Antimony	mg/L	MCL	0.003	
	Arsenic	mg/L	MCL	0.005	
	Barium	mg/L	MCL	1	
	Beryllium	mg/L	MCL	0.002	
	Cadmium	mg/L	MCL	0.0025	
	Chromium (total)	mg/L	MCL	0.05	
	Copper	mg/L	SMCL	1	3
	Iron	mg/L	SMCL	0.3	
	Lead	mg/L	MML	0.05	
	Manganese	mg/L	SMCL	0.05	
	Mercury (inorganic)	mg/L	MCL	0.001	
	Selenium	mg/L	MCL	0.025	
	Silver	mg/L	SMCL	0.1	
	Thallium	mg/L	MCL	0.001	
	Zinc	mg/L	SMCL	5	
(E) Miscellaneous	Color	Color units	SMCL	15	
	Corrosivity	--	SMCL	noncorrosive	
	Cyanide (as free cyanide)	mg/L	MCL	0.1	
	Fluoride	mg/L	MCL, SMCL	2	
	Foaming Agents (Surfacants)	mg/L	SMCL	0.5	
	Odor	Threshold odor number	SMCL	3	
(F) Radionuclides	Gross Alpha (Alpha particles)	pCi/L	MCL, MML	15	4
	Radium 228	pCi/L	None	--	
	Combined Radium 226 and 228 (calculate)	pCi/L	MCL, MML	5	5
	Radium 226	pCi/L	None	--	5
	Uranium	ug/L	MCL	30	6
(G) Synthetic Organic Compounds	1,2-Dibromo-3-chloropropane (DBCP)	mg/L	MCL	0.0001	
	2,4,5-TP (Silvex)	mg/L	MML	0.005	
	2,4-D	mg/L	MCL	0.035	
	Alachlor	mg/L	MCL	0.001	
	Atrazine	mg/L	MCL	0.0015	
	Benzo(a)pyrene (PAHs)	mg/L	MCL	0.0001	
	Carbofuran	mg/L	MCL	0.02	
	Chlordane	mg/L	MCL	0.001	
	Dalapon	mg/L	MCL	0.1	
	Di(2-ethylhexyl) adipate	mg/L	MCL	0.2	
	Di(2-ethylhexyl) phthalate	mg/L	MCL	0.003	
	Dinoseb	mg/L	MCL	0.0035	
	Dioxin (2,3,7,8-TCDD)	mg/L	MCL	0.000000015	
	Diquat	mg/L	MCL	0.01	
	Endothall	mg/L	MCL	0.05	
	Endrin	mg/L	MML	0.0001	
	Ethylene dibromide (EDB)	mg/L	MCL	0.000025	
	Glyphosate	mg/L	MCL	0.35	
	Heptachlor	mg/L	MCL	0.0002	
	Heptachlor epoxide	mg/L	MCL	0.0001	
	Hexachlorobenzene	mg/L	MCL	0.0005	
	Hexachlorocyclopentadiene	mg/L	MCL	0.025	
	Lindane (BHC-gamma)	mg/L	MCL	0.0001	
	Methoxychlor	mg/L	MCL	0.02	
	Oxamyl (Vydate)	mg/L	MCL	0.1	
	Pentachlorophenol	mg/L	MCL	0.0005	
	Picloram	mg/L	MCL	0.25	
	Polychlorinatedbiphenyls (PCBs)	mg/L	MCL	0.00025	
	Simazine	mg/L	MCL	0.002	
	Toxaphene	mg/L	MCL	0.0015	
(H) Volatile Organic Compounds	1,1,1-Trichloroethane	mg/L	MCL, MML	0.1	
	1,1,2-Trichloroethane	mg/L	MCL	0.0025	
	1,1-Dichloroethylene	mg/L	MCL, MML	0.0035	
	1,2,4-Trichlorobenzene	mg/L	MCL	0.035	
	1,2-Dichloroethane (ethylene chloride)	mg/L	MCL, MML	0.0025	
	1,2-Dichloropropane	mg/L	MCL	0.0025	
	Benzene	mg/L	MCL, MML	0.0025	
	Carbon tetrachloride	mg/L	MCL, MML	0.0025	
	Chlorobenzene	mg/L	MCL	0.05	
	cis-1,2-Dichloroethylene	mg/L	MCL	0.035	
	Ethylbenzene	mg/L	MCL	0.35	
	Methylene chloride (dichloromethane)	mg/L	MCL	0.0025	
	o-Dichlorobenzene	mg/L	MCL	0.3	
	p-Dichlorobenzene	mg/L	MCL, MML	0.0375	
	Styrene	mg/L	MCL	0.05	
	Tetrachloroethylene (perchloroethylene)	mg/L	MCL	0.0025	
	Toluene	mg/L	MCL	0.5	
	trans-1,2-Dichloroethylene	mg/L	MCL	0.05	
	Trichloroethylene	mg/L	MCL, MML	0.0025	
	Vinyl chloride	mg/L	MCL, MML	0.001	
	Xylenes (total)	mg/L	MCL	5	

NOTE

* - ASR Standards = Lowest value within MCL/2, MML/2 and SMCL except Disinfection Byproducts and Radionuclides.
- ASR Standards for Disinfection Byproducts and Radionuclides = Lowest value within MCL, MML and SMCL.

Definitions:

- Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
- Maximum Residual Disinfectant Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- Treatment Technique (TT) - A required process intended to reduce the level of a contaminant in drinking water.

1. More than 5.0% samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or E. coli if two consecutive TC-positive samples, and one is also positive for E.coli fecal coliforms, system has an acute MCL violation.

2. The MCL values are the same in the Stage 2 DBPR as they were in the Stage 1 DBPR, but compliance with the MCL is based on different calculations. Under Stage 1, compliance is based on a running annual average (RAA). Under Stage 2, compliance is based on a locational running annual average (LRAA), where the annual average at each sampling location in the distribution system is used to determine compliance with the MCLs. The LRAA requirement will become effective April 1, 2012 for systems on schedule 1, October 1, 2012 for systems on schedule 2, and October 1, 2013 for all remaining systems.

3. Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

4. Including Radium 225 but excluding Radon and Uranium.

5. If the gross alpha is less than or equal to 5 pCi/L, then that numerical value can be substituted for the radium 226 analysis, so combined radium 226 and 228 is equal to gross alpha plus radium 228. If gross alpha plus radium 228 over 5 pCi/L, and don't have radium 226, we will have to resample or reanalyze and resubmit complete results for gross alpha, radium 226 and radium 228.

6. If the gross alpha is less than or equal to 15 pCi/L then that numerical value can be substituted for the uranium analysis. But If gross alpha over 15 pCi/L and uraniums are not reported, we will have to resample or reanalyze and resubmit complete results for gross alpha, radium 226, radium 228 and uranium.

APPENDIX A

OWRD ASR LIMITED LICENSE APPLICATION FORM

AS CURRENTLY ANTICIPATED

11. **SOURCE OF INJECTION WATER for ASR:** Tualatin Valley Water District (TVWD)
a tributary of _____

12. **MAXIMUM DIVERSION RATE:** Up to 100 gpm

13. **MAXIMUM INJECTION RATE AT EACH WELL(S):** Up to 100 gpm

14. **MAXIMUM STORAGE VOLUME:** 30 MG at any one time

15. **MAXIMUM STORAGE DURATION:** 1 year, could be greater than 1 year depending on demand for stored water

16. **MAXIMUM WITHDRAWAL RATE AT EACH WELL(S):** 320 gpm

NOTE: The materials required by rule for an ASR limited license are extensive. The items on this sheet consist of those outlined in OAR 690-350-020(2) and (3)(a)(A-E). Please consult the rule and provide as attachments to this form the other requirements in OAR 690-350-020(3)(a).

Signature of Applicant C. Logan **Date** 4/23/10

Title Executive Director

APPENDIX B

LABORATORY ANALYTICAL RESULTS

ANALYSIS REPORT

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

CLIENT

GSI Water Solutions
Attn: Larry Eaton
55 SW Yamhill, Ste. 300
Portland, Oregon 97204

phone: 503-239-8799

Date Reported: 2/17/10
Date Sampled: 1/11/10 10:48a
Date Received: 1/11/10
Job Number: **10011/02**
Page: 1 of 3

Project #: 265:004
Project Name: Liberty High School ASR
Sampling Location: Liberty High School
Sampled By: R. Peavler
Sample Composition: Raw, Source

Final Report

Laboratory Sample #			**Results** 10011/02		Method Reporting Limit
Client Identification			**Liberty HS**	SMCL	
Contaminant	Code	Method	mg/L; (ppm)	mg/L; (ppm)	mg/L; (ppm)
Alkalinity	1067	EPA 310.1	**154**	-	2
Bicarbonate	-	SM4500-CO2 D	**154**	-	2
Carbonate	-	SM4500-CO2 D	**ND**	-	2
Chloride	1017	SM4500-Cl E	**90**	250	5
Corrosivity	1910	SM2330-B	**-0.36** Moderately Aggressive	Non Aggressive	
Fluoride	1025	SM4500-F C	**ND**	2	0.5
Hardness	1916	EPA 130.2	**172**	250	4
Nitrate	1040	SM4500-NO3 D	**ND**	10	0.5
Nitrate & Nitrite	-	calc.	**ND**	10	0.01
Nitrite	1041	SM4500-NO2 B	**ND**	1	0.01
Silica	1049	EPA 370.1	**32**	-	1
Sulfate	1055	EPA 300.0	**ND***	250	1.00
Total Dissolved Solids	1930	EPA 160.1	**396**	500	1
Total Organic Carbon	2920	SM5310-C	**2.55**	-	0.50
Total Suspended Solids	1063	EPA 160.2	**2**	2	2
Calcium	1919	SM3111D	**50**	-	1.0
Iron (total)	1028	SM 3111B	**ND**	0.3	0.1
Iron (dissolved)	1028	SM 3111B	**ND**	-	0.1
Magnesium	1031	EPA 200.7	**16.1**	-	2.5
Manganese (total)	1032	SM3111B	**0.05**	0.05	0.02
Manganese (dissolved)	1032	SM3111B	**0.05**	-	0.02
Potassium	1042	SM 3111B	**7.4**	-	0.5
Sodium	1052	SM 3111B	**73.0**	20	0.4

ND = None Detected

SMCL= Secondary Maximum Contaminant Level

This report reflects the results for this sample only.

*Analyzed at Umpqua Research Co.
626 Division St. Myrtle Creek, OR 97457
Contact Lisa Leming: (541) 863-5201

ANALYSIS REPORT

Analysis by: ORELAP ID# OR100013

Alexin Analytical LABORATORIES, INC. **Professional Laboratory Services**

CLIENT

GSI Water Solutions
Attn: Larry Eaton
55 SW Yamhill, Ste. 300
Portland, Oregon 97204

phone: 503-239-8799

Date Reported: 2/17/10
Date Sampled: 1/11/10 10:48a
Date Received: 1/11/10
Job Number: **10011/02**
Page: 2 of 3

Project #: 265:004
Project Name: Liberty High School ASR
Sampling Location: Liberty High School
Sampled By: R. Peavler
Sample Composition: Raw, Source

Final Report

Sample ID:		10011/02	Laboratory Reporting	Date
Client ID:		**Liberty HS**	Limit	Analyzed
	Method	mg/L;ppm	mg/L;ppm	
Aluminum	EPA 200.9	**0.10**	0.02	2/10/10
Antimony	EPA 200.9	**ND**	0.001	2/8/10
Arsenic	EPA 200.9	**ND**	0.003	1/13/10
Barium	EPA 200.7	**0.06**	0.05	1/20/10
Beryllium	EPA 200.7	**ND**	0.002	1/20/10
Cadmium	SM 3113B	**ND**	0.0005	1/26/10
Chromium	EPA 200.7	**ND**	0.01	1/20/10
Copper	SM3111B	**ND**	0.05	1/13/10
Lead	EPA 200.9	**ND**	0.002	1/14/10
Mercury	EPA 245.1	**ND**	0.0003	2/4/10
Nickel	EPA 200.7	**ND**	0.02	1/20/10
Selenium	EPA 200.9	**ND**	0.005	2/9/10
Silver	EPA 200.7	**ND**	0.02	1/20/10
Thallium	EPA 200.9	**ND**	0.001	1/14/10
Zinc	SM3111B	**ND**	0.01	2/3/10

ND=None Detected

ANALYSIS REPORT

Analysis by: ORELAP ID# OR100013

Alexin Analytical LABORATORIES, INC. Professional Laboratory Services

CLIENT

GSI Water Solutions
Attn: Larry Eaton
55 SW Yamhill, Ste. 300
Portland, Oregon 97204

phone: 503-239-8799

Date Reported: 2/17/10
Date Sampled: 1/11/10 10:48a
Date Received: 1/11/10
Job Number: **10011/02**

Project #: 265:004
Project Name: Liberty High School ASR
Sampling Location: Liberty High School
Sampled By: R. Peavler
Sample Composition: Raw, Source

Final Report

Sample ID:		10011/02	Laboratory Reporting	Date
Client ID:		**Liberty HS**	Limit	Analyzed
Analysis	Method	mg/L;ppm	mg/L;ppm	
Color	SM2120B	**ND**	5 cu	1/11/10
MBAS	EPA 425.1	**ND**	0.05	1/11/10
Odor	SM2150-B	**1 TON**	1 TON	1/11/10
Corrosivity	SM2330B	**-0.36**		1/12/10
		Moderately Aggressive		
Cyanide (free)	SM4500 CN-E	**ND**	0.02	1/20/10

ND=None Detected TON = Threshold Odor Number CU = Color Units

Approved By:

Scott Dickman
Inorganic Technical Director

ANALYSIS REPORT

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

CLIENT

City of Beaverton/Public Works
P.O. Box 4755
Beaverton, Oregon 97076

Date Reported: 1/26/09
Date Sampled: 12/16/08 9:15am
Date Received: 12/16/08
Job Number: **08351/01**
Page: 1 of 5

Project Name: ASR #4
Sampling Location: Beaverton, OR 97076
Sample Composition: Treated, Distribution, Single
Sampled By: Beth Dolbow

PWSID: 4100081

Geochemical

Lab Number:		08351/01	Laboratory Reporting	Date
Sample ID:		**HNSN-C12SW-1**	Limit	Analyzed
Analysis	Method	mg/L;ppm	mg/L;ppm	
Bicarbonate	SM4500-CO2D	**39**	2	12/30/08
Calcium	SM 3111D	**10.0**	2	1/9/09
Carbonate	SM4500-CO2D	**ND**	2	12/30/08
Chloride	SM4500-Cl E	**7**	1	12/18/08
Hardness	EPA 130.2	**40**	4	12/17/08
Magnesium	EPA 200.7	**2.93**	0.01	1/5/09
Nitrate	SM4500-NO3 D	**0.7**	0.5	12/16/08 4:50pm
Nitrate&Nitrite	-	**0.7**	0.01	-
Nitrite	SM4500-NO2 B	**ND**	0.01	12/17/08 2:30pm
Potassium	SM 3111B	**0.6**	0.5	12/31/08
Silica	EPA 370.1	**15**	1	12/30/08
Sodium	SM 3111B	**12.3**	0.1	1/7/09
Sulfate	EPA 375.4	**13**	5	12/18/08
Total Alkalinity	EPA 310.1	**39**	2	12/30/08
Total Dissolved Solids	EPA 160.1	**97**	1	12/17/08
Total Suspended Solids	EPA 160.2	**ND**	2	12/19/08
Total Organic Carbon	SM 5310 C	**1.75**	0.50	12/30/08

This report reflects the results for this sample only

ND=None Detected

ANALYSIS REPORT

Analysis by: ORELAP ID# OR100013

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

CLIENT

City of Beaverton
P.O. Box 4755
Beaverton, Oregon 97076

Date Reported: 1/26/09
Date Sampled: 12/16/08 9:15am
Date Received: 12/16/08
Job Number: **08351/01**

Project Name: ASR #4
Sampling Location: Beaverton, OR 97076
Sample Composition: Treated, Distribution, Single
Sampled By: Beth Dolbow

Metals

Sample ID:		08351/01	Laboratory	
Client ID:		**HNSN-C12SW-1**	Reporting	Date
Analysis	Method	Total Metals	Limit	Analyzed
		mg/L;ppm	mg/L;ppm	
Aluminum	EPA 200.7	**ND**	0.05	1/5/09
Antimony	EPA 200.9	**ND**	0.001	1/7/09
Arsenic	EPA 200.9	**ND**	0.003	12/26/08
Barium	EPA 200.7	**ND**	0.05	1/5/09
Beryllium	EPA 200.7	**ND**	0.001	1/5/09
Cadmium	SM 3113B	**ND**	0.0005	1/8/09
Chromium	EPA 200.7	**ND**	0.01	1/5/09
Copper	EPA 200.7	**ND**	0.05	1/5/09
		total **dissolved**		
Iron	SM3111B	**ND** **ND**	0.05	12/29/08
Lead	EPA 200.9	**ND**	0.002	12/23/08
		total **dissolved**		
Manganese	EPA200.7	**ND** **ND**	0.02	12/30/08
Mercury	EPA 245.1	**ND**	0.0003	1/12/09
Nickel	EPA 200.7	**ND**	0.02	1/5/09
Selenium	EPA 200.9	**ND**	0.005	12/30/08
Silver	EPA 200.7	**ND**	0.02	1/5/09
Thallium	EPA 200.9	**ND**	0.001	1/8/09
Zinc	EPA 200.7	**ND**	0.01	1/5/09

ND=None Detected

ANALYSIS REPORT

Alexin Analytical LABORATORIES, INC. Professional Laboratory Services

Analysis by: ORELAP ID#OR100013

CLIENT
City of Beaverton/Public Works
P.O. Box 4755
Beaverton, Oregon 97076

Date Reported: 1/27/09
Date Sampled: 12/16/08 9:15am
Date Received: 12/16/08
Job Number: **08351/01**
Page: 3 of 5

Project Name: ASR #4
Sampling Location: Beaverton, OR 97076
Sample Composition: Treated, Distribution, Single
Sampled By: Beth Dolbow

PWSID: 4100081

Misc.

Sample ID:		08351/01	Laboratory Reporting	Date
Client ID:		**HNSN-C12SW-1**	Limit	Analyzed
Analysis	Method	mg/L;ppm	mg/L;ppm	
Color	SM2120B	**ND**	5 cu	12/17/09
Corrosivity	SM2330B	**-0.59**		12/30/08
		Moderately Aggressive		
Fluoride	SM4500-F C	**0.9**	0.5	1/5/09
MBAS	EPA 425.1	**ND**	0.05	12/17/08
Odor	SM2150-B	**1 TON**	1 TON	12/17/08
Cyanide	SM4500 CN-C/E	**ND**	0.02	12/27/08

ND=None Detected
cu=color units
TON=threshhold odor number

Approved By:

Scott Dickman
Inorganic Technical Director

ANALYSIS REPORT

Alexin Analytical Laboratories, Inc. — Professional Laboratory Services

Analysis by: ORELAP #WY200001

CLIENT

City of Beaverton/Public Works
P.O. Box 4755
Beaverton, Oregon 97076

Date Reported: 3/2/10
Date Sampled: 12/16/08 9:15am
Date Received: 12/16/08
Job Number: **08351/01**
Page: 1 of 1

Project Name: ASR #4
PWSID #: 4100081
Sampling Location: Beaverton, OR 97076
Sample Composition: Treated, Distribution, Single
Sampled By: Beth Dolbow
Sample Identification: HNSN-C12SW-1

Analysis	EPA Code	Method	Results pCi/L	Laboratory Reporting Limit pCi/L	EPA Limit pCi/L
Gross Alpha	4000	E900.0	**0.9 +/- 0.8**	0.7	15
Radium226/228	4010	E903.0 & RA-05	**ND**	0.9	5
Gross Beta	4100	E900.0	**ND**	1.5	50

Analysis	EPA Code	Method	Results mg/L	Laboratory Reporting Limit mg/L	EPA Limit mg/L
Uranium	4006	E200.8	**ND**	0.001	0.03

ND = None Detected

Analysis by Energy Laboratories, Inc. 2393 Salt Creek Hwy. Casper, WY 82601
Contact: Roger Garling 888-235-0515

This report reflects the results for this sample only.

This report shall not be reproduced, except in full, without the written approval of the laboratory.

Reviewed By:

Scott Dickman
Inorganic Technical Director

ANALYSIS REPORT

CLIENT

City of Beaverton
P.O. Box 4755
Beaverton, Oregon 97076

phone: 503-526-2208
fax: 503-526-2535

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

Analysis by: ORELAP ID #OR100031

Project Name: ASR #4
Sampling Location: Beaverton, OR 97076
Sample Composition: Treated, Distribution, Single
Sampled By: Beth Dolbow
Sample identification: HNSN-C12SW-1

Date Reported: 1/27/09
Date Sampled: 12/16/08 9:15am
Date Received: 12/16/08
Job Number: **08351/01**

PWSID #: 4100081

Regulated Synthetic Organic Compounds

FRDS#	COMPOUND	RESULT mg/L	MCL mg/L	MRL mg/L	EPA Method	FRDS#	COMPOUND	RESULT mg/L	MCL mg/L	MRL mg/L	EPA Method
2946	EDB	ND	0.00005	0.00001	504.1	2383	Polychlorinatedbiphenyls-PC	ND	0.0005	0.00002	508.1
2931	DBCP	ND	0.0002	0.00002	504.1	2031	Dalapon	ND	0.2	0.002	515.3
2051	Alachlor (Lasso)	ND	0.002	0.0004	525.2	2041	Dinoseb	ND	0.007	0.00040	515.2
2050	Atrazine	ND	0.003	0.0002	525.2	2326	Pentachlorophenol	ND	0.001	0.00008	515.2
2037	Simazine	ND	0.004	0.0001	525.2	2040	Picloram	ND	0.5	0.00020	515.2
	Chlordane	ND	0.002	0.00004	508.1	2105	2,4-D	ND	0.07	0.00020	515.2
2005	Endrin	ND	0.002	0.00002	525.2	2110	2,4,5-TP (Silvex)	ND	0.05	0.00040	515.2
2065	Heptachlor	ND	0.0004	0.00004	525.2	2306	Benzo(a)pyrene	ND	0.0002	0.00004	525.2
2067	Heptachlor Epoxide	ND	0.0002	0.00002	525.2	2035	Bis(2-ethylhexyl)adipate	ND	0.4	0.001	525.2
2274	Hexachlorobenzene	ND	0.001	0.0001	525.2	2039	Bis(2-ethylhexyl)phthalate	ND	0.006	0.001	525.2
2042	Hexachlorocyclopentad	ND	0.05	0.0002	525.2	2046	Carbofuran	ND	0.04	0.001	531.1
2010	BHC-gamma (Lindan	ND	0.0002	0.00002	525.2	2036	Vydate (Oxamyl)	ND	0.2	0.002	531.1
2015	Methoxychlor	ND	0.04	0.0002	525.2	2034	Glyphosate	ND	0.7	0.010	547
2020	Toxaphene	ND	0.003	0.0001	508.1	2033	Endothall	ND	0.1	0.010	548.1
						2032	Diquat	ND	0.02	0.0004	549.2

Unregulated Synthetic Organic Compounds

FRDS#	COMPOUND	RESULT mg/L		MRL mg/L	EPA Method	FRDS#	COMPOUND	RESULT mg/L		MRL mg/L	EPA Method
2076	Butachlor	ND		0.0001	525.2	2047	Aldicarb	ND		0.002	531.1
2045	Metolachlor	ND		0.0002	525.2	2044	Aldicarb Sulfone	ND		0.001	531.1
2595	Metribuzin	ND		0.0001	525.2	2043	Aldicarb Sulfoxide	ND		0.003	531.1
2356	Aldrin	ND		0.0001	525.2	2021	Carbaryl	ND		0.004	531.1
2070	Dieldrin	ND		0.0001	525.2	2066	3-Hydroxycarbofuran	ND		0.004	531.1
2077	Propachlor	ND		0.0001	525.2	2022	Methomyl	ND		0.004	531.1
2440	Dicamba	ND		0.00050	515.2						

EPA Method	Analysis Date
504.1	12/18/08
508.1	1/7/09
515.2	1/5/09
515.3	12/21/08
525.2	1/5/09

EPA Method	Analysis Date
531.1	1/12/09
547	12/17/08
548.1	1/5/09
549.2	1/9/09

ND=None Detected
MCL=Maximum Contaminant Level
MRL=Method Reporting Limit

UMPQUA RESEARCH COMPANY*
Reported By

* 626 Division St., Myrtle Creek, OR 97457 Contact: Lisa Leming (541) 863-5201

Reviewed By:
Scott Dickman
Inorganic Technical Director

ORELAP # OR100013

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

Volatile Organic Compounds

Date Reported:	12/19/2008	Job Number:	08351/01	Page 1 of 2
System ID #:	4100081	Source ID:		
Water System	City of Beaverton/ Public Works	Attn:		
Address	P.O. Box 4755	Project Name:	Ase #4	
City, State, Zip	Beaverton, OR 97076	Sample Composition	Treated/Distribution/Single	
SAMPLE IDENTIFICATION:	HNSN – C12SW-1			
Sampled by:	Beth Dolbow	Date/Time Collected:	12/16/08	
Date Received in Lab:	12/16/2008	Date Analyzed:	12/17/2008	
Lab sample ID#:	08351/01	Analyst: AGG	Method: 524.2	

Regulated VOC

Contaminant	Code	MRL (mg/L)	Sample Results (mg/L)	MCL (mg/L)
Benzene	2990	0.0005	ND	0 0050
Carbon Tetrachloride	2982	0.0005	ND	0 0050
Chlorobenzene	2989	0.0005	ND	0 1000
1,2-Dichlorobenzene	2968	0 0005	ND	0 6000
1,4-Dichlorobenzene	2969	0 0005	ND	0 0750
1,2-Dichloroethane	2980	0 0005	ND	0 0050
1 1-Dichloroethylene	2977	0 0005	ND	0 0070
cis-1 2-Dichloroethylene	2380	0 0005	ND	0 0700
trans-1 2-Dichloroethylene	2979	0 0005	ND	0 1000
Dichloromethane	2964	0 0005	ND	0.0050
1,2-Dichloropropane	2983	0.0005	ND	0 0050
Ethylbenzene	2992	0.0005	ND	0.7000
Styrene	2996	0 0005	ND	0 1000
Tetrachloroethylene	2987	0.0005	ND	0 0050
Toluene	2991	0 0005	ND	1 0000
1,2,4-Trichlorobenzene	2378	0 0005	ND	0 0700
1 1,1-Trichloroethane	2981	0 0005	ND	0 2000
1,1,2-Trichloroethane	2985	0 0005	ND	0.0050
Trichloroethylene	2984	0 0005	ND	0 0050
Vinyl Chloride	2976	0.0005	ND	0 0020
Xylenes, total	2955	0.0015	ND	10 0000

ND = None Detected MRL = Minimum Reporting Level

Analyst Notes

Approved by _____
Adriana Gonzalez Gray
Organic Technical Director

Reviewed by _____
Scott Dickman
Lab Director

ORELAP # OR100013

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

Volatile Organic Compounds

Date Reported:	12/19/2008	**Job Number:**	08351/01	Page 2 of 2
System ID #:	4100081	**Source ID:**		
Water System	City of Beaverton/ Public Works	Attn		
Address	P O. Box 4755	Project Name. Ase #4		
City, State, Zip	Beaverton, OR 97076	Sample Composition. Treated/Distribution/Single		
SAMPLE IDENTIFICATION:	HNSN – C12SW-1			
Sampled by	Beth Dolbow	Date/Time Collected.	12/16/08	
Date Received in Lab.	12/16/2008	Date Analyzed.	12/17/2008	
Lab sample ID#.	08351/01	Analyst. AGG	Method: 524.2	

Unregulated VOC

Contaminant	MRL (mg/L)	Sample Results (mg/L)	Contaminant	MRL (mg/L)	Sample Results (mg/L)
Bromobenzene	0 0005	ND	1,1-Dichloroethane	0 0005	ND
Bromochloromethane	0 0005	ND	1,3-Dichloropropane	0 0005	ND
Bromodichloromethane	0 0005	0.0036	2,2-Dichloropropane	0 0005	ND
Bromoform	0 0005	ND	*cis*-1,3-Dichloropropene	0.0005	ND
Bromomethane	0 0005	ND	*trans*-1,3-Dichloropropene	0 0005	ND
n-Butylbenzene	0 0005	ND	Fluorotrichloromethane	0 0005	ND
sec-Butylbenzene	0 0005	ND	Hexachlorobutadiene	0 0005	ND
tert-Butylbenzene	0 0005	ND	Isopropylbenzene	0 0005	ND
tert-Butyl methyl ether (MTBE)	0 0005	ND	4-Isopropyltoluene	0 0005	ND
Chloroethane	0 0005	ND	Naphthalene	0 0005	ND
Chloroform	0 0005	0.0178	*n*-Propylbenzene	0 0005	ND
Chloromethane	0 0005	ND	1,1,1,2-Tetrachloroethane	0 0005	ND
2-Chlorotoluene	0 0005	ND	1,1,2,2-Tetrachloroethane	0 0005	ND
4-Chlorotoluene	0 0005	ND	1,2,3-Trichlorobenzene	0 0005	ND
Dibromochloromethane	0 0005	ND	1,2,3-Trichloropropane	0 0005	ND
Dibromomethane	0 0005	ND	1,2,4-Trimethylbenzene	0 0005	ND
1,3-Dichlorobenzene	0 0005	ND	1,3,5-Trimethylbenzene	0 0005	ND
Dichlorodifluoromethane	0 0005	ND			

ND = None Detected MRL = Minimum Reporting Level

Analyst Notes

Approved by. _____
Adriana Gonzalez-Gray
Organic Technical Director

Reviewed by. _____
Scott Dickman
Lab Director

All procedures for this report conform to NELAC standards

ORELAP # OR100013

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

Total Trihalomethanes and Haloacetic Acids

Date Reported:	**12/29/2008**	**Job Number:**	**08351/01 – 02** **Page 1 of 1**
System ID #:	**4100081**		
Water System	City of Beaverton/ Public Works	Attn:	
Address	P.O. Box 4755	Project Name:	ASR #4
City, State, Zip	Beaverton, OR 97076	Sample Composition:	

SAMPLE IDENTIFICATION: (Listed below sample results)

Sampled by:	Beth Bolbow	Date Collected:	12/16/2008
Date Received in Lab:	12/16/2008	Date Analyzed:	THM: 12/17/08 HAA: 12/19/08
Lab sample ID#:	**(Listed below)**	Analyst:	THM: AGG HAA: AGG

TRIHALOMETHANES	Method: EPA 524.2				
	MRL (mg/L)	Sample Results (mg/L) #1 – 08351/01	#2 – 08351/02		
$CHCl_3$ (Chloroform)	0.0010	**0.0220**	**0.0170**		
$CHBrCl_2$ (Bromodichloromethane)	0.0010	**0.0037**	**0.0012**		
$CHBr_2Cl$ (Dibromochloromethane)	0.0010	**ND**	**ND**		
$CHBr_3$ (Bromoform)	0.0010	**ND**	**ND**		
Total THM (2950)		**0.0257**	**0.0182**		
Max. Contaminant Level	0.0800 mg/L				

HALOACETIC ACIDS	Method SM 6251B				
	MRL (mg/L)	Sample Results (mg/L) #1 – 08351/01	#2 – 08351/02		
MCAA (Monochloroacetic acid)	0.0020	**ND**	**ND**		
DCAA (Dichloroacetic acid)	0.0010	**0.0133**	**ND**		
MBAA (Monobromoacetic Acid)	0.0010	**ND**	**ND**		
TCAA (Trichloroacetic acid)	0.0010	**0.0136**	**ND**		
DBAA (Dibromoacetic acid)	0.0010	**ND**	**ND**		
Total HAA5 (2456)		**0.0269**	**0.0000**		
Max. Contaminant Level	0.0600 mg/L				

Client ID:

#1: HNSN – C12SW – 1 (Treated/Distribution/Single)

#2: HNSN – C12GW (Raw/Source/Single)

ND = None Detected

MRL = Minimum Reporting Level

Analyst Notes

Approved by: _____
Adriana Gonzalez-Gray
Organic Technical Director

Reviewed by: _____
Scott Dickman
Lab Director

All procedures for this report conform to NELAC standards

ANALYSIS REPORT

Alexin Analytical LABORATORIES, INC.

Professional Laboratory Services

CLIENT

City of Beaverton/Public Works
P.O. Box 4755
Beaverton, Oregon 97076

Date Reported: 5/26/09
Date Sampled: 4/13/09 8:30
Date Received: 4/13/09
Job Number: **09103/03**

Project Name: HNSN-C12SW-3
Sampling Location: Beaverton, OR 97076
Sample Composition:Treated, Distribution, Single
Sampled By: Beth Dolbow

PWSID: 4100081

Geochemical

Lab Number:		09103/03	Laboratory Reporting	Date
Sample ID:		**HNSN-C12SW-3**	Limit	Analyzed
Analysis	Method	mg/L;ppm	mg/L;ppm	
Bicarbonate	SM4500-CO2D	**28**	2	4/21/09
Calcium	SM 3111D	**7.7**	0.2	5/6/09
Carbonate	SM4500-CO2D	**ND**	2	4/21/09
Chloride	SM4500-Cl E	**4**	1	4/17/09
Hardness	EPA 130.2	**30**	4	4/15/09
Magnesium	EPA 200.7	**2.26**	0.01	4/28/09
Nitrate	SM4500-NO3 D	**0.8**	0.5	4/14/09 4:20pm
Nitrate&Nitrite	-	**0.8**	0.01	-
Nitrite	SM4500-NO2 B	**ND**	0.01	4/14/09 3:20pm
Potassium	SM 3111B	**0.5**	0.5	4/30/09
Silica	EPA 370.1	**15**	1	4/14/09
Sodium	SM 3111B	**10.1**	0.1	4/14/09
Sulfate	EPA 375.4	**9**	5	4/30/09
Total Alkalinity	EPA 310.1	**28**	2	4/21/09
Total Dissolved Solids	EPA 160.1	**72**	1	4/13-14/09
Total Suspended Solids	EPA 160.2	**ND**	2	4/17/09
Total Organic Carbon	SM 5310 C	**2.55**	0.50	4/23/09

This report reflects the results for this sample only

ND=None Detected

ANALYSIS REPORT

Alexin Analytical LABORATORIES, INC. Professional Laboratory Services

Analysis by: ORELAP ID# OR100013

CLIENT

City of Beaverton/Public Works
P.O. Box 4755
Beaverton, Oregon 97076

Date Reported: 5/26/09
Date Sampled: 4/13/09 8:30
Date Received: 4/13/09
Job Number: **09103/03**

Project Name: HNSN-C12SW-3
Sampling Location: Beaverton, OR 97076
Sample Composition:Treated, Distribution, Single
Sampled By: Beth Dolbow

Metals

Sample ID:		09103/03	Laboratory	
Client ID:		**HNSN-C12SW-3**	Reporting	Date
Analysis	Method	Total Metals	Limit	Analyzed
		mg/L;ppm	mg/L;ppm	
Aluminum	EPA 200.7	**0.18**	0.05	5/21/09
Antimony*	EPA 200.9	**ND**	0.001	4/21/09
Arsenic	EPA 200.9	**ND**	0.003	4/14/09
Barium	EPA 200.7	**ND**	0.05	4/28/09
Beryllium	EPA 200.7	**ND**	0.001	4/28/09
Cadmium	SM 3113B	**ND**	0.0005	5/5/09
Chromium	EPA 200.7	**ND**	0.01	4/28/09
Copper	EPA 200.7	**ND**	0.05	4/28/09
		total dissolved		
Iron	EPA 200.7	**ND** **ND**	0.05	4/28/09
Lead	EPA 200.9	**ND**	0.002	4/20/09
		total dissolved		
Manganese	EPA200.7	**ND** **ND**	0.02	4/28/09
Mercury	EPA 245.1	**ND**	0.0003	4/22/09
Nickel	EPA 200.7	**ND**	0.02	4/28/09
Selenium	EPA 200.9	**ND**	0.005	5/3/09
Silver	EPA 200.7	**ND**	0.02	4/28/09
Thallium	EPA 200.9	**ND**	0.001	4/21/09
Zinc	EPA 200.7	**ND**	0.05	4/28/09

ND=None Detected

* Matrix spike failure for this analyte.

ANALYSIS REPORT

Alexin Analytical LABORATORIES, INC. Professional Laboratory Services

Analysis by: ORELAP ID#OR100013

CLIENT
City of Beaverton/Public Works
P.O. Box 4755
Beaverton, Oregon 97076

Date Reported: 5/26/09
Date Sampled: 4/13/09 8:30
Date Received: 4/13/09
Job Number: **09103/03**

Project Name: HNSN-C12SW-3
Sampling Location: Beaverton, OR 97076
Sample Composition:Treated, Distribution, Single
Sampled By: Beth Dolbow

PWSID: 4100081

Misc.

Sample ID: / Client ID:		09103/03 **HNSN-C12SW-3**	Laboratory Reporting Limit	Date Analyzed
Analysis	Method	mg/L;ppm	mg/L;ppm	
Color	SM2120B	**ND**	5 cu	4/13/09
Corrosivity	SM2330B	**-2.05** **Highly Aggressive**		4/21/09
Fluoride	SM4500-F C	**0.9**	0.5	4/21/09
MBAS	EPA 425.1	**ND**	0.05	4/13/09
Odor	SM2150-B	**2 TON**	1 TON	4/13/09
Cyanide	SM4500 CN-E	**ND**	0.02	4/23/09

ND=None Detected
cu=color units
TON=threshhold odor number

ND=None Detected

Approved By:

Scott Dickman
Inorganic Technical Director

APPENDIX C

WELL LOGS

WASH 58925

RECEIVED

NOV 0 1 2002

WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 61020
START CARD # 153464

(1) LAND OWNER Well Number
Name HILLSBORO SCHOOL DIST.1J (Robinson CONST)
Address 22775 N.W. DOGWOOD ST.
City HILLSBORO State OR Zip 97124

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

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

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 648 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
20	0	38	Bentonite	0	38	36 Sacks
15	38	499	Cement	0	85	42 Sacks
			Drillgel	85	400	---
			Cement	400	499	70 Sacks
10	499	648				

Method ☐ A ☐ B ☒ C ☒ D ☐ E
☒ Other Poured into annular
Backfill placed from 85 ft. to 400 ft. Material Drill Gel
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	16"	0	38	.250	☒	☐	☒	☐
	10"	+1	499	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☒ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
200		400	1 hr.
240		500	"
275		645	"

Temperature of water 56°F Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☒ Other High Iron
Depth of strata: 500-510 (Cemented off)

(9) LOCATION OF WELL by legal description:
County Washington Latitude Longitude
Township 1N N or S Range 2W E or W. WM.
Section 14 SW 1/4 SW 1/4
Tax Lot 102 Lot Block Subdivision
Street Address of Well (or nearest address)
21945 WAGON WAY, HILLSBORO, OR

(10) STATIC WATER LEVEL:
100 ft. below land surface. Date 10-24-02
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found 535

From	To	Estimated Flow Rate	SWL
535	648	275gpm	100'

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Brn clay	0	26	
Gry clay	26	32	
Sticky gry-brn clay	32	59	
Sticky brn clay	59	71	
Sticky gry clay	71	92	
Coarse brn sand	92	97	
Sticky gry clay	97	194	
Fine to coarse blk sand	194	217	
Sticky blue-gry clay	217	296	
Decomp brn basalt	296	334	
Sticky gry clay	334	434	
Firm brn clay	434	456	
Decomp brn basalt	456	485	
Firm Gry-blk basalt	485	537	W.B.
Hard gry basalt	537	574	100'
Soft blk basalt	574	582	
Firm blk basalt w/clay stone seams.	582	592	
Hard gry basalt occ Frac.	592	648	100'

Date started 10-02-02 Completed 10-24-02

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

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1266
Signed Date 10/25/02

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

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

WASH 2118

RECEIVED
OCT 14 1993
WATER RESOURCES DEPT.
SALEM, OREGON

1N/2W/15a

(START CARD) # 60202

(1) OWNER:
Well Number
Name RUSS & MARIE TURNEY
Address 10676 NW VALLEY VISTA RD
City HILLSBORO State OR Zip 97124

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

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

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 486 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
10	0	413	Cement	0	70	22 sks.
			Drill gel	70	360	
			Cement	360	413	22 sks.
6	413	486				

How was seal placed: Method ☐ A ☐ B ☒ C ☒ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6	+1	413	250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
50		475	1 hr.
18		200	"

Temperature of Water 57° F Depth Artesian Flow Found
Was a water analysis done? ☒ Yes By whom AMJ
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County WASHINGTON Latitude Longitude
Township 1N N or S. Range 2W E or W. WM.
Section 15 SW ¼ NE ¼
Tax Lot 212 Lot Block Subdivision
Street Address of Well (or nearest address) 23510 NW PUBLOS RD
HILLSBORO, OR 9712

(10) STATIC WATER LEVEL:
74 ft. below land surface. Date 10/02/93
Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:
Depth at which water was first found 467

From	To	Estimated Flow Rate	SWL
467	481	50 gpm	74

(12) WELL LOG:
Ground elevation

Material	From	To	SWL
Topsoil	0	1	
Brown clay	1	33	
Sticky gray clay	33	44	
Sticky gray-brown clay	44	85	
Sticky gray clay	85	118	
Sticky gray-brown clay	118	138	
Fine gray sand	138	147	
Sticky gray clay	147	170	
Soft sandy blue-gray clay	170	181	
Sticky blue-gray clay	181	239	
Sticky gray-brown clay	239	277	
Firm gray-brown clay	277	318	
Soft brown clay	318	349	
Firm decomp gray-brown basalt	349	367	
Firm gray-black basalt	367	374	
Decomp gray-brown basalt	374	396	
Firm gray-brown basalt	396	407	
Firm gray-black basalt	407	417	
Soft visic brown basalt	417	420	
Hard coarse grained gray-black	420	467	
Soft black basalt	467	481	74
Firm gray basalt	481	486	

Date started 09/27/93 Completed 10/02/93

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

WWC Number
Signed Date

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

WWC Number 1266
Signed Date 10/06/93

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER 9809C 10/91

10

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

WASH 4012

RECEIVED
AUG - 1 1994
WATER RESOURCES DEPT.
SALEM, OREGON

IN/Cw/146C

(START CARD) # 68050

(1) OWNER:
Well Number 203
Name Wes Eplen
Address 5478 NW Bunnningtree Cont.
City Portland State OR, Zip 97229

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

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

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 500 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
10	0	25	cement	0	25	8
8	25	440	cement	25	440	40
6	440	500				

How was seal placed: Method ☐ A ☒ B ☐ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6	+2	440	4	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
30	400	500	1 hr.

Temperature of Water 59 Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Wash. Latitude Longitude
Township 1 N or S. Range 2 E or W. WM.
Section 14 SW ¼ NW ¼
Tax Lot 3000 Lot Block Subdivision
Street Address of Well (or nearest address) 21393 West Union

(10) STATIC WATER LEVEL:
98 ft. below land surface. Date 7/19/94
Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:
Depth at which water was first found 455

From	To	Estimated Flow Rate	SWL
455	490	30	98

(12) WELL LOG:
Ground elevation

Material	From	To	SWL
top soil	0	1	
clay brown	1	10	
clay/sand brown	10	25	
clay gray	25	100	
clay/sand brown	100	410	
rock brown broken	410	425	
rock gray	425	455	
rock gray/brown/green	455	490	98
rock gray	490	500	

Date started 7/14/94 Completed 7/19/94

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

Signed WWC Number 1622
Date 7/26/94

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

Signed WWC Number 663
Date 7/26/94

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER 9809C 10/91

S1064

AUG 22 1996 WELL I.D.# L02830

STATE OF OREGON

WATER SUPPLY WELL REPORT

(as required by ORS 537.765) WATER RESOURCES DEPT. SALEM, OREGON

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

(START CARD) # 86756

(1) OWNER: Well Number

Name DON HAMBURG

Address 21425 NW NICHLOAS CT.

City HILLSBORO State OR Zip 97124

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:

[X] Rotary Air [X] Rotary Mud [ ] Cable [ ] Auger

[ ] Other

(4) PROPOSED USE:

[X] Domestic [ ] Community [ ] Industrial [ ] Irrigation

[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [X] No Depth of Completed Well 430 ft.

Explosives used [ ] Yes [X] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	387	Cement	0	50	18 SKS
			Drill Gel	50	327	------
			Cement	327	387	20 SKS
6"	387	430				

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

[ ] Other

Backfill placed from ft. to ft. Material

Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+1	387	250	[X]	[ ]	[X]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

[ ] Perforations Method

[ ] Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

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

[ ] Pump [ ] Bailer [X] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
45		250	1 hr.
17		150	"

Temperature of water 60°F Depth Artesian Flow Found

Was a water analysis done? [X] Yes By whom AMJ

Did any strata contain water not suitable for intended use? [ ] Too little

[ ] Salty [ ] Muddy [ ] Odor [ ] Colored [ ] Other

Depth of strata:

(9) LOCATION OF WELL by legal description:

County WASHINGTON Latitude Longitude

Township 1N N or S Range 2W E or W. WM.

Section 15 NE 1/4 SW 1/4

Tax Lot 216 Lot Block Subdivision

Street Address of Well (or nearest address) 23670 NW PUBLOS RD HILLSBORO, OR

(10) STATIC WATER LEVEL:

100 ft. below land surface. Date 08/16/96

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 426

From	To	Estimated Flow Rate	SWL
426	427	45 GPM	100

(12) WELL LOG:

Ground Elevation

Material	From	To	SWL
Topsoil	0	1	
Hard brown clay	1	4	
Soft silty brown clay	4	13	
Soft silty gray clay	13	42	
Sticky gray clay	42	86	
Sticky gray-brown clay	86	107	
Sticky blue-gray clay	107	244	
Sticky brown clay	244	339	
Firm gray-brown clay	339	374	
Hard gray-black basalt	374	419	
Soft black basalt	419	423	
Hard gray-black basalt	423	430	100

Date started 08/08/96 Completed 08/16/96

(unbonded) Water Well Constructor Certification:

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

WWC Number

Signed Date

(bonded) Water Well Constructor Certification:

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

WWC Number 1266

Signed Date 08/19/96

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

STATE OF OREGON SEP - 9 1996 WELL I.D.# L02831 WELLS

WATER SUPPLY WELL REPORT WATER RESOURCES DEPT.

(as required by ORS 537.765) SALEM, OREGON (START CARD) # 86760

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

(1) OWNER: Well Number

Name ARNOLD LEPPIN

Address 25360 NW WEST UNION RD

City HILLSBORO State OR Zip 97124

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:

[X] Rotary Air [X] Rotary Mud [ ] Cable [ ] Auger

[ ] Other

(4) PROPOSED USE:

[X] Domestic [ ] Community [ ] Industrial [ ] Irrigation

[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [X] No Depth of Completed Well 785 ft.

Explosives used [ ] Yes [XX] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	742	Cement	0	30	10 SKS
			Drill Gel	30	670	------
			Cement	670	742	25 SKS
6"	742	785				

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

[ ] Other

Backfill placed from ft. to ft. Material

Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+1	742	.250	[X]	[ ]	[X]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

[ ] Perforations Method

[ ] Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

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

[ ] Pump [ ] Bailer [X] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
40		750	1 hr.
30		500	"
20		300	"

Temperature of water 60°F Depth Artesian Flow Found

Was a water analysis done? [X] Yes By whom AMJ

Did any strata contain water not suitable for intended use? [ ] Too little

[ ] Salty [ ] Muddy [ ] Odor [ ] Colored [ ] Other

Depth of strata:

(9) LOCATION OF WELL by legal description:

County WASHINGTON Latitude Longitude

Township 1N N or S Range 2W E or W. WM.

Section 9 SW 1/4 SE 1/4

Tax Lot 1200 Lot Block Subdivision

Street Address of Well (or nearest address) 25360 NW WEST [redacted] UNI(RD., HILLSBORO, OR

(10) STATIC WATER LEVEL:

84 ft. below land surface. Date 09/03/96

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 742

From	To	Estimated Flow Rate	SWL
742	780	40 GPM	84

(12) WELL LOG:

Ground Elevation

Material	From	To	SWL
Topsoil	0	1	
Hard brown clay	1	6	
Soft brown silty clay	6	15	
Soft gray silty clay	15	31	
Sticky lite gray clay	31	44	
Sticky brown clay	44	74	
Sticky gray clay	74	153	
Soft blue-gray clay	153	179	
Sticky gray&gray-brown clay	179	353	
Soft dark brown clay	353	381	
Sticky dark gray clay	381	408	
Firm gray clay	408	482	
Soft brown basalt	482	489	
Decomp.gray-brown basalt	489	507	
Hard gray clay	507	644	
Firm gray-black basalt	644	648	
Decomp. gray basalt	648	659	
Firm gray-black basalt	659	666	
Decomp. brown basalt	666	683	
Soft brown basalt	683	728	
Firm gray-brown basalt	728	785	84

Date started 08/15/96 Completed 09/03/96

(unbonded) Water Well Constructor Certification:

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

WWC Number

Signed Date

(bonded) Water Well Constructor Certification:

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

WWC Number 1266

Signed [signature] Date 09/04/96

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
AUG 28 1970
STATE ENGINEER
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

WASH 5297

State Well No. 1N/2W-14

State Permit No.

(1) OWNER:
Name Alvin J. Herbert (West Union Garage)
Address Rte 1 Box 361 ~~Hillsboro~~, Hillsboro, Ore.

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

(3) TYPE OF WELL:
Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

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

(5) CASING INSTALLED:
Threaded ☐ Welded ☒
5" Diam. from 0 ft. to 414 ft. Gage ¼ wall
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ 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.
perforations from ft. to ft.
perforations from ft. to ft.

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

(8) WATER LEVEL: Completed well.
Static level 59'-6" ft. below land surface Date 8-9-70
Artesian pressure lbs. per square inch Date

(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.
" " " "
" " " "
Bailer test 20 gal./min. with 200 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:
Well seal—Material used
Depth of seal ft.
Diameter of well bore to bottom of seal in.
Were any loose strata cemented off? ☐ Yes ☐ No Depth
Was a drive shoe used? ☐ Yes ☒ No
Did any strata contain unusable water? ☒ Yes ☐ No
Type of water? red water depth of strata 340 feet
Method of sealing strata off 5 inch casing
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(11) LOCATION OF WELL:
County Washington Driller's well number
¼ ¼ Section 14 T. 1-N R. 2-W W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing 4-3/4
Depth drilled 498' 75 ft. Depth of completed well 495 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
Hard Blue rock	444	445	
Black lava	445	450	
Hard blue rock	450	492	
Black lava	492	495	

Work started 8-2-70 19 Completed 8-6-70 19
Date well drilling machine moved off of well 8-6-70 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Ralph Turner Date 8-26, 1970
(Drilling Machine Operator)
Drilling Machine Operator's License No. 254

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME Ralph Turner Drilling Co.
(Person, firm or corporation) (Type or print)
Address Rte 1 Box 141 Hillsboro, Oregon 9712
[Signed] Ralph Turner
(Water Well Contractor)
Contractor's License No. 247 Date 8-26, 1970

(USE ADDITIONAL SHEETS IF NECESSARY)

WASH 54271

DEC 1 1 1998

WATER RESOURCES DEPT.
SALEM, OREGON

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

WELL I.D. # L 27708

START CARD # 118199

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

(1) OWNER: Well Number

Name LARRY BOITANO

Address 10443 N.W.LOST PARK DR.

City PORTLAND State OR Zip 97229

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:

[X] Rotary Air [X] Rotary Mud [ ] Cable [ ] Auger

[ ] Other

(4) PROPOSED USE:

[X] Domestic [ ] Community [ ] Industrial [ ] Irrigation

[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [X] No Depth of Completed Well 400 ft.

Explosives used [ ] Yes [X] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10	0	170	Bent.	0	25	17SKS
			Drill gel	25	100	
			Cement	100	170	15SKS
6	170	420	Cement	400	420	3SKS

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

[X] Other Poured into annular

Backfill placed from ft. to ft. Material

Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6	+1	170	.250	[X]	[ ]	[X]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

[ ] Perforations Method

[ ] Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

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

[ ] Pump [ ] Bailer [X] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
4		350	1 hr.

Temperature of water 57° Depth Artesian Flow Found

Was a water analysis done? [ ] Yes By whom

Did any strata contain water not suitable for intended use? [ ] Too little

[X] Salty [ ] Muddy [ ] Odor [ ] Colored [ ] Other

Depth of strata: 418 - 420 (SEALED OFF)

(9) LOCATION OF WELL by legal description:

County WASH Latitude Longitude

Township 1N N or S Range 1W E or W. WM.

Section 18 SE 1/4 NE 1/4

Tax Lot 1202 Lot Block Subdivision

Street Address of Well (or nearest address) NW BRUGGER RD.

(10) STATIC WATER LEVEL:

91 ft. below land surface. Date 12/4/98

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 357

From	To	Estimated Flow Rate	SWL
357	365	4 GPM	91

(12) WELL LOG:

Ground Elevation

Material	From	To	SWL
Topsoil	0	1	
Brown Clay	1	5	
Sticky H.brown clay	5	27	
Sticky red-brown clay	27	33	
Decomp. red-brown basalt	33	43	
Firm gray basalt	43	84	
brown clay occ.rock fragment.	84	89	
Firm gray basalt	89	105	
Decomp. red-brown basalt	105	153	
Firm gray-brown basalt	153	159	
Hard gray basalt	159	201	
Soft black basalt	201	230	
Firm gray-black basalt	230	353	
Sticky gray-green clay	353	355	
Firm gray-black basalt occ.black interbed.	355	420	91
WELL COMPLETED @ 400 FT.			

Date started 11/11/98 Completed 12/1/98

(unbonded) Water Well Constructor Certification:

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

WWC Number

Signed Date

(bonded) Water Well Constructor Certification:

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

WWC Number 1266

Signed Date 12/10/98

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

STATE OF OREGON

WATER SUPPLY WELL REPORT

(as required by ORS 537.765)

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

Wash 54761

JUN 4 1999

WATER RESOURCES DEPT.
SALEM, OREGON

WELL ID # L28233

(START CARD) # 115096

(1) OWNER:

Well Number: 578

Name: Steve Chinick

Address: PO Box 245

City: Hillsboro State: OR Zip: 97123

(2) TYPE OF WORK:

[X] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:

[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger

[ ] Other

(4) PROPOSED USE:

[X] Domestic [ ] Community [ ] Industrial [ ] Irrigation

[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [X] No Depth of Completed Well 480 ft.

Explosives used [ ] Yes [X] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
10"	0	25	Bentonite	0	25	8 Sacks
8"	25	435	Cement	25	435	
6"	435	480				

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

[ ] Other

Backfill placed from ft. to ft. Material

Gravel placed from ft. to ft. Size of gravel

CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+2	435	1/4	[X]	[ ]	[X]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

[ ] Perforations Method

[ ] Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

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

[ ] Pump [ ] Bailer [X] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
30		480	1 hr.

Temperature of Water 56 Depth Artesian Flow found

Was a water analysis done? [ ] Yes By whom

Did any strata contain water not suitable for intended use? [ ] Too little

[ ] Salty [ ] Muddy [ ] Odor [ ] Colored [ ] Other

Depth of strata:

(9) LOCATION OF WELL by legal description:

County Washington Latitude Longitude

Township 1N N or S. Range 2W E or W. of WM.

Section 14 SW ¼ NE ¼

Tax Lot 700 Lot Block Subdivision

Street Address of Well (or nearest address)

21300 NW West Union Hills Rd., Hillsboro

(10) STATIC WATER LEVEL:

75 ft. below land surface. Date 5/13/99

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 130

From	To	Estimated Flow Rate	SWL
130	150	15	130
370	400	30	100
450	480	30	75

(12) WELL LOG:

Ground elevation

Material	From	To	SWL
Clay Brown	0	20	
Clay & Gravel Brown	20	25	
Clay Brown	25	60	
Clay Blue Gray	60	130	
Sand Cemented Brown	130	150	130
Clay & Gravel Brown	150	290	
Clay Red	290	370	
Basalt Soft Brown	370	400	100
Basalt Gray	400	450	
Basalt Broken Gray	450	480	75

Date started 5/10/99 Completed 5/13/99

(unbonded) Water Well Constructor Certification:

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

WWC Number

Signed Date

(bonded) Water Well Constructor Certification:

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

WWC Number 663

Signed Date 6/2/99

AMERICAN WELL DRILLING

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER

STATE OF OREGON

SEP 2 0 2000

WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

WATER RESOURCES DEPT.
SALEM, OREGON

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

WELL I.D. # L 43484
START CARD # 136070

(1) LAND OWNER Well Number ____
Name TARA FRANCIS
Address 1221 SW BROOKWOOD AVE
City HILLSBORO State OR Zip 97123

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

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

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 460 ft.
Explosives used ☐ Yes ☒ No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10	0	400	Bent.	0	23	13 sks
			Drill gel	23	340	----
			Cement	340	400	15 sks
6	400	460				

How was seal placed: Method ☐ A ☐ B ☒ C ☐ D ☐ E
☒ Other Poured into annular
Backfill placed from ____ ft. to ____ ft. Material ____
Gravel placed from ____ ft. to ____ ft. Size of gravel ____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+1	400	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☐ None
Final location of shoe(s) ____

(7) PERFORATIONS/SCREENS:
☐ Perforations Method ____
☐ Screens Type ____ Material ____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
70		450	1 hr.
22		200	" "

Temperature of water 56°F Depth Artesian Flow Found ____
Was a water analysis done? ☒ Yes By whom AMJ
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other ____
Depth of strata: ____

(9) LOCATION OF WELL by legal description:
County WASHINGTON Latitude ____ Longitude ____
Township 1N N or S Range 2W E or W. WM.
Section 15 NE 1/4 SW 1/4
Tax Lot 215 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) 23797 SW SHAAF RD.

(10) STATIC WATER LEVEL:
122 ft. below land surface. Date 09/16/00
Artesian pressure ____ lb. per square inch Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 450

From	To	Estimated Flow Rate	SWL
450	460	70 gpm	122

(12) WELL LOG:
Ground Elevation ____

Material	From	To	SWL
Topsoil	0	1	
Brown clay	1	4	
Soft brown silty clay	4	20	
Soft gray silty clay	20	32	
Sticky gray clay	32	53	
Sticky brown clay	53	64	
Sticky gray clay	64	183	
Soft gray clay w/sandy seams & wood	183	195	
Sticky blue-gray clay	195	233	
Soft brown sandy clay	233	241	
Sticky blue-gray clay	241	254	
Soft brown clay	254	281	
Sticky gray-brown clay	281	392	
Hard gray basalt	392	437	
Firm gray-black basalt	437	460	122

Date started 09/11/00 Completed 09/16/00

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

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in ~~compliance~~ with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1266
Signed ____ Date 09/18/00

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

RECEIVED
FEB 21 2003
WATER RESOURCES DEPT
SALEM, OREGON

WASH 59240
WASH
59240

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 61969
START CARD # 155356

(1) LAND OWNER Well Number
Name PEGGY DEMARINI (Page 1)
Address 6860 NW SCHAAF RD.
City HILLSBORO State OR Zip 97124

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

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

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 485 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	50'	Bentonite	0	50	26 sacks
9"	50	423	Cem.Grout	200	423	23 sacks
6"	423	485				

How was seal placed: Method ☐ A ☒ B ☒ C ☐ D ☐ E
☒ Other Poured into annular
Backfill placed from 50 ft. to 200 ft. Material Highvis.gel
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+2'	423.250		☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☒ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
60		485	1 hr.
50		400	"
30		250	"

Temperature of water 54°F Depth Artesian Flow Found
Was a water analysis done? ☒ Yes By whom A.M.J.
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Washington Latitude Longitude
Township 1N N or S Range 2W E or W. WM.
Section 15 NW 1/4 SE 1/4
Tax Lot 00211 Lot Block Subdivision
Street Address of Well (or nearest address) 6860 NW Schaaf Rd. Hillsboro, Or 97124

(10) STATIC WATER LEVEL:
115 ft. below land surface. Date 2-14-03
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found 427'

From	To	Estimated Flow Rate	SWL
427	440	20gpm	115
450	475	40gpm	115

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Topsoil	0	1	
Brn clay	1	5	
Soft brn clay	5	20	
Soft Gry clay	20	25	
Gry brn clay	25	58	
Brn sand	58	65	
Gry brn clay	65	89	
Brn sand w/wood	89	93	
Brn clay	93	99	
Silty gry brn clay	99	103	
Blue cly w/silty strks	103	116	
Brn & blk sand w/wood	116	126	
Soft gry brn clay	126	146	
Sticky gry brn clay	146	157	
Very silty blue clay	157	196	
Blue cly w/occ gry strks	196	214	
Soft silty blue gry clay w/wood streaks.	214	238	
Sticky gry clay	238	262	

Date started 1-21-03 Completed 2-14-03

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number 1805
Signed Dwayne Bigsby Date 2-19-03

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1266
Signed Date 02/19/03

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

WASH 59240

59240

FEB 2 1 2003

WATER RESOURCES DEPT
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 61969
START CARD # 155356

(1) LAND OWNER Well Number _____
Name PEGGY DEMARINI (Page2)
Address 6860 NW SCHAAF RD.
City HILLSBORO State OR Zip 97124

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

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

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 485 ft.
Explosives used ☐ Yes ☒ No Type _____ Amount _____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☐ Other _____
Backfill placed from _____ ft. to _____ ft. Material _____
Gravel placed from _____ ft. to _____ ft. Size of gravel _____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☐ None
Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:
☐ Perforations Method _____
☐ Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.

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

(9) LOCATION OF WELL by legal description:
County WASHINGTON Latitude _____ Longitude _____
Township 1N N or S Range 2W E or W. WM.
Section 15 NW 1/4 SE 1/4
Tax Lot 00211 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) 6860 NW SCHAAF RD.

(10) STATIC WATER LEVEL:
115 ft. below land surface. Date 02/14/03
Artesian pressure _____ lb. per square inch Date _____

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

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:
Ground Elevation _____

Material	From	To	SWL
Blue gry cly w/occ silt streaks.	262	294	
Red brn sand	294	306	
Gry brn clay	306	354	
Drk gry clay	354	403	
Soft blk basalt	403	409	
Hard gry blk basalt	409	427	
Blk basalt w/fractures	427	440	115
Hard gry blk basalt	440	450	≤
Gry brn basalt w/soft brn streaks.	450	475	115
Gry brn basalt	475	485	

Date started _____ Completed _____

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

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

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

WASH 66595

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

WELL LABEL # L 93918

START CARD # 197232

(1) LAND OWNER

Owner Well I.D.

First Name KEN Last Name BRYAN

Company

Address 26290 NW MEEK RD

City HILLSBORO State OR Zip 97124

(2) TYPE OF WORK

[X] New Well [ ] Deepening [ ] Conversion
[ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD

[X] Rotary Air [X] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other

(4) PROPOSED USE

[X] Domestic [ ] Irrigation [ ] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION

Special Standard [ ] Attach copy

Depth of Completed Well 785 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs
10	0	150	Cement	0	190	137	S
8.75	150	708	Cement	190	708		
6	708	785					

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

Backfill placed from ft. to ft. Material

Filter pack from ft. to ft. Material Size

Explosives used: [ ] Yes Type Amount

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
◉	○	6	X	1	708	.250	◉	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		
○	○						○	○		

Shoe [ ] Inside [ ] Outside [ ] Other Location of shoe(s)

Temp casing [ ] Yes Dia From To

(7) PERFORATIONS/SCREENS

Perforations Method

Screens Type Material

Perf/Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size

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

○ Pump ○ Bailer ◉ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
30		200	1 HR
50		400	
75		750	1 HR

Temperature 62 °F Lab analysis [ ] Yes By

Water quality concerns? [ ] Yes (describe below)

From	To	Description	Amount	Units

RECEIVED
FEB 22 2008
WATER RESOURCES DEPT
SALEM, OREGON

(9) LOCATION OF WELL (legal description)

County WASHING. Twp 1 N N/S Range 2 W E/W WM

Sec 16 SW 1/4 of the SW 1/4 Tax Lot 800

Tax Map Number Lot

Lat ° 0 ' " or DMS or DD

Long ° 0 ' " or DMS or DD

◉ Street address of well ○ Nearest address

26290 NW MEEK RD

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Predeepening				
Completed Well	02-18-2008			76

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 778

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
02-18-2008	778	785	75			76

(11) WELL LOG

Ground Elevation

Material	From	To
TOPSOIL	0	1
SOFT BROWN CLAY	1	24
SOFT GRAY CLAY	24	36
STICKY GRAY CLAY	36	43
STICKY BROWN CLAY	43	101
FINE TO MED. GRAY SAND	101	105
STICKY GRAY CLAY	105	120
FINE GRAY SAND	120	128
STICKY GRAY CLAY	128	136
SOFT GRAY SANDY CLAY	136	151
STICKY GRAY CLAY	151	210
SOFT GRAY SANDY CLAY	210	222
STICKY GRAY CLAY	222	232
FIRM BLUE-GRAY CLAY	232	260
STICKY GRAY CLAY	260	335
SOFT GRAY SANDY CLAY	335	392
STICKY GRAY CLAY	392	412
SOFT GRAY SANDY CLAY	412	535
STICKY RED-BROWN CLAY	535	550

Date Started 01-29-2008 Completed 02-18-2008

(unbonded) Water Well Constructor Certification

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

License Number Date

Password : (if filing electronically)

Signed

(bonded) Water Well Constructor Certification

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

License Number 1266 Date 2/21/08

Password : (if filing electronically)

Signed

Contact Info (optional)

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK

Form Version: 0.89

WASH 66595

WATER SUPPLY WELL REPORT - continuation page

WELL I.D. # L 93918

START CARD # 197232

(5) BORE HOLE CONSTRUCTION

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/ lbs

FILTER PACK

From	To	Material	Size

(6) CASING/LINER

Casing Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

(7) PERFORATIONS/SCREENS

Perf/Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size

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

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)

Water Quality Concerns

From	To	Description	Amount	Units

(10) STATIC WATER LEVEL

Water Bearing Zones

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)

(11) WELL LOG

Material	From	To
DECOMP RED-BROWN BASALT	550	579
STICKY RED-BROWN CLAY	579	646
FIRM DECOMP RED-BROWN BASALT	646	672
FIRM GRAY-BROWN BASALT	672	706
FIRM GRAY BASALT	706	711
FIRM GRAY-BLACK BASALT	711	785

RECEIVED
FEB 22 2008
WATER RESOURCES DEPT
SALEM, OREGON

Comments/Remarks

APPENDIX D

WATER RIGHTS FOR SOURCE WATER

STATE OF OREGON

COUNTY OF WASHINGTON

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

CITY OF HILLSBORO
205 SE 2ND AVENUE
HILLSBORO, OREGON 97123

confirms the right to use the waters of THE TUALATIN RIVER, a tributary of THE WILLAMETTE RIVER, for MUNICIPAL USE.

This right was perfected under PERMIT 10408. The date of priority is AUGUST 15, 1930. This right is limited to 9.0 CUBIC FEET PER SECOND or its equivalent in case of rotation, measured at the point of diversion from the source. The quantity of water diverted at the new point of diversion shall not exceed the quantity of water available at the old point of diversion, and shall not exceed 9.0 cubic feet per second.

The points of diversion are located as follows:

HAINES FALLS INTAKE - SE 1/4 SE 1/4, SECTION 20, T 1 S, R 5 W, W.M.; 1100 FEET NORTH AND 200 FEET WEST FROM THE SOUTHEAST CORNER OF SECTION 20. SPRING HILL INTAKE - SW 1/4 SW 1/4, SECTION 8, T 1 S, R 3 W, W.M.; 500 FEET NORTH AND 410 FEET EAST FROM THE SOUTHWEST CORNER OF SECTION 8.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use to which this right is appurtenant is as follows:

S 1/2
NW 1/4
SECTION 32
TOWNSHIP 1 NORTH, RANGE 2 WEST, W.M.

S 1/2
SECTION 33

S 1/2
SECTION 34

S 1/2
SECTION 35
TOWNSHIP 1 NORTH, RANGE 3 WEST, W.M.

ALL
SECTION 7

NE 1/4
SECTION 16

ALL
SECTION 17

ALL
SECTION 18

N 1/2
SECTION 19
TOWNSHIP 1 SOUTH, RANGE 1 WEST, W.M.

SEE NEXT PAGE

SE 1/4
SECTION 1

E 1/2
SECTION 4

ALL
SECTION 5

N 1/2
SE 1/4
SECTION 6

ALL
SECTION 9

N 1/2
SECTION 10

N 1/2
SECTION 11

ALL
SECTION 12

ALL
SECTION 13

W 1/2
SECTION 24
TOWNSHIP 1 SOUTH, RANGE 2 WEST, W.M.

N 1/2
SECTION 1

N 1/2
SECTION 2

N 1/2
SECTION 3

N 1/2
SECTION 4

N 1/2
SECTION 5

S 1/2
SECTION 6

NW 1/4
SECTION 7
TOWNSHIP 1 SOUTH, RANGE 3 WEST, W.M.

E 1/2
SECTION 12

N 1/2
SW 1/4
SECTION 13

SE 1/4
SECTION 14
TOWNSHIP 1 SOUTH, RANGE 4 WEST, W.M.

SEE NEXT PAGE

NE 1/4
SW 1/4
SECTION 23

W 1/2
SECTION 26

E 1/2
SECTION 27

N 1/2
SECTION 31

NW 1/4
SE 1/4
SECTION 32

NE 1/4
SW 1/4
SECTION 33

N 1/2
SECTION 34

ALL
SECTION 35
TOWNSHIP 1 SOUTH, RANGE 4 WEST, W.M.

S 1/2
SECTION 25

N 1/2
SECTION 36
TOWNSHIP 1 SOUTH, RANGE 5 WEST, W.M.

This certificate is issued to confirm an ADDITIONAL POINT OF DIVERSION approved by an order of the Water Resources Director entered MARCH 7, 1977, and supersedes Certificate 23540, State Record of Water Right Certificates.

The issuance of this superseding certificate does not confirm the status of the water right in regard to the provisions of ORS 540.610 pertaining to forfeiture or abandonment.

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described. The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

WITNESS the signature of the Water Resources Director, affixed OCTOBER 12, 1992.

/s/ MARTHA O. PAGEL

Martha O. Pagel

Recorded in State Record of Water Right Certificates numbered 67891.

T-3130.JSR

STATE OF OREGON

COUNTIES OF WASHINGTON AND YAMHILL

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

CITY OF HILLSBORO
150 MAIN STREET, THIRD FLOOR
HILLSBORO OR 97123

confirms the right to use the waters of TUALATIN RIVER, a tributary of the Willamette River, for MUNICIPAL USE.

This right was perfected under Permit 46423. The date of priority is FEBRUARY 6, 1974. The amount of water to which this right is entitled is limited to an amount actually used beneficially, and shall not exceed 43.0 CUBIC FEET PER SECOND or its equivalent in case of rotation, measured at the point of diversion.

The point of diversion is located as follows:

Twp	Rng	Mer	Sec	Q-Q	Measured Distances
1 S	3 W	WM	8	SW SW	500 FEET NORTH & 410 FEET EAST FROM SW CORNER, SECTION 8

The right to the use of the water for the above purpose is restricted to beneficial use on the lands or place of use described.

A description of the place of use to which this right is appurtenant is as follows:

Twp	Rng	Mer	Sec	Q-Q
1 N	2 W	WM	19	S 1/2 S 1/2
1 N	2 W	WM	20	S 1/2 S 1/2
1 N	2 W	WM	21	S 1/2 S 1/2
1 N	2 W	WM	22	S 1/2 S 1/2
1 N	2 W	WM	23	S 1/2 SW 1/4
1 N	2 W	WM	26	W 1/2
1 N	2 W	WM	27	ALL
1 N	2 W	WM	28	ALL
1 N	2 W	WM	29	ALL
1 N	2 W	WM	30	ALL
1 N	2 W	WM	31	ALL
1 N	2 W	WM	32	ALL

NOTICE OF RIGHT TO PETITION FOR RECONSIDERATION OR JUDICIAL REVIEW

This is an order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080, you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied. In addition, under ORS 537.260 any person with an application, permit or water right certificate subsequent in priority may jointly or severally contest the issuance of the certificate at any time before it has issued, and after the time has expired for the completion of the appropriation under the permit, or within three months after issuance of the certificate.

Twp	Rng	Mer	Sec	Q-Q
1 N	2 W	WM	33	ALL
1 N	2 W	WM	34	ALL
1 N	2 W	WM	35	W 1/2
1 N	3 W	WM	24	S 1/2 SE 1/4
1 N	3 W	WM	25	E 1/2
1 N	3 W	WM	25	N 1/2 NW 1/4
1 N	3 W	WM	25	SE 1/4 NW 1/4
1 N	3 W	WM	25	E 1/2 SW 1/4
1 N	3 W	WM	30	SW 1/4
1 N	3 W	WM	31	ALL
1 N	3 W	WM	32	S 1/2 NE 1/4
1 N	3 W	WM	32	S 1/2 NW 1/4
1 N	3 W	WM	32	S 1/2
1 N	3 W	WM	33	S 1/2 N 1/2
1 N	3 W	WM	33	S 1/2
1 N	3 W	WM	34	S 1/2 N 1/2
1 N	3 W	WM	34	S 1/2
1 N	3 W	WM	35	SW 1/4 NW 1/4
1 N	3 W	WM	35	S 1/2
1 N	3 W	WM	36	E 1/2
1 N	3 W	WM	36	E 1/2 NW 1/4
1 N	3 W	WM	36	SW 1/4
1 N	4 W	WM	25	NW 1/4 NW 1/4
1 N	4 W	WM	25	S 1/2 NW 1/4
1 N	4 W	WM	25	S 1/2
1 N	4 W	WM	26	NE 1/4 NE 1/4
1 N	4 W	WM	26	S 1/2 NE 1/4
1 N	4 W	WM	26	SE 1/4 NW 1/4
1 N	4 W	WM	26	S 1/2
1 N	4 W	WM	35	NE 1/4
1 N	4 W	WM	35	N 1/2 NW 1/4
1 N	4 W	WM	35	SE 1/4 NW 1/4
1 N	4 W	WM	35	N 1/2 SE 1/4
1 N	4 W	WM	35	SE 1/4 SE 1/4
1 N	4 W	WM	36	ALL
1 S	1 W	WM	5	S 1/2 S 1/2
1 S	1 W	WM	7	E 1/2 SW 1/4
1 S	1 W	WM	7	SW 1/4 SW1/4
1 S	1 W	WM	8	ALL
1 S	1 W	WM	9	E 1/2 NE 1/4
1 S	1W	WM	9	SW 1/4 NE 1/4
1 S	1 W	WM	9	W 1/2 SW 1/4
1 S	1 W	WM	9	SE 1/4 SW 1/4
1 S	1W	WM	9	SE 1/4
1 S	1 W	WM	10	N 1/2
1 S	1 W	WM	10	SW 1/4
1 S	1 W	WM	10	N 1/2 SE 1/4
1 S	1 W	WM	14	SW 1/4 NE 1/4
1 S	1 W	WM	14	NE 1/4 NW 1/4

Twp	Rng	Mer	Sec	Q-Q
1 S	1 W	WM	14	S 1/2 NW 1/4
1 S	1 W	WM	14	SW 1/4
1 S	1 W	WM	14	W 1/2 SE 1/4
1 S	1 W	WM	15	W 1/2 NE 1/4
1 S	1 W	WM	15	SE 1/4 NE 1/4
1 S	1 W	WM	15	W 1/2
1 S	1 W	WM	15	SE 1/4
1 S	1 W	WM	16	ALL
1 S	1 W	WM	17	ALL
1 S	1 W	WM	20	ALL
1 S	1 W	WM	21	ALL
1 S	1 W	WM	22	ALL
1 S	1 W	WM	23	W 1/2
1 S	1 W	WM	23	W 1/2 NE 1/4
1 S	1 W	WM	23	SE 1/4 NE 1/4
1 S	1 W	WM	26	W 1/2 NW 1/4
1 S	1 W	WM	26	W 1/2 SW 1/4
1 S	1 W	WM	27	ALL
1 S	1 W	WM	28	ALL
1 S	1 W	WM	29	ALL
1 S	1 W	WM	32	ALL
1 S	1 W	WM	33	NE 1/4
1 S	1 W	WM	33	NW 1/4
1 S	1 W	WM	33	N 1/2 SW 1/4
1 S	1 W	WM	33	SW 1/4 SW 1/4
1 S	2 W	WM	2	W 1/2
1 S	2 W	WM	3	ALL
1 S	2 W	WM	4	ALL
1 S	2 W	WM	5	ALL
1 S	2 W	WM	6	ALL
1 S	2 W	WM	7	E 1/2 NE 1/4
1 S	2 W	WM	7	NW 1/4
1 S	2 W	WM	7	N 1/2 SW 1/4
1 S	2 W	WM	7	NE 1/4 SE 1/4
1 S	2 W	WM	8	ALL
1 S	2 W	WM	9	N 1/2
1 S	2 W	WM	9	N 1/2 SW 1/4
1 S	2 W	WM	9	S 1/2 SW 1/4
1 S	2 W	WM	9	SE 1/4
1 S	2 W	WM	10	ALL
1 S	2 W	WM	11	NW 1/4
1 S	2 W	WM	11	N 1/2 SW 1/4
1 S	2 W	WM	11	N 1/2 SE 1/4
1 S	2 W	WM	11	SE 1/4 SE 1/4
1 S	2 W	WM	12	S 1/2
1 S	2 W	WM	14	E 1/2 NE 1/4
1 S	2 W	WM	14	SW 1/4 NE 1/4
1 S	2 W	WM	16	NW 1/4 NW 1/4
1 S	2 W	WM	17	N 1/2 NE 1/4

Twp	Rng	Mer	Sec	Q-Q
1 S	2 W	WM	17	NE 1/4 NW 1/4
1 S	3 W	WM	1	N 1/2
1 S	3 W	WM	1	NE 1/4 SW 1/4
1 S	3 W	WM	1	N 1/2 SE 1/4
1 S	3 W	WM	2	N 1/2 N 1/2
1 S	3 W	WM	3	NE 1/4 NE 1/4
1 S	3 W	WM	3	W 1/2 NE 1/4
1 S	3 W	WM	3	NW 1/4
1 S	3 W	WM	4	N 1/2
1 S	3 W	WM	4	N 1/2 SW 1/4
1 S	3 W	WM	4	SE 1/4 SW 1/4
1 S	3 W	WM	4	N 1/2 SE 1/4
1 S	3 W	WM	4	SW 1/4 SE 1/4
1 S	3 W	WM	5	N 1/2
1 S	3 W	WM	5	SW 1/4
1 S	3 W	WM	5	N 1/2 SE 1/4
1 S	3 W	WM	5	SW 1/4 SE 1/4
1 S	3 W	WM	6	N 1/2
1 S	3 W	WM	6	N 1/2 SW 1/4
1 S	3 W	WM	6	SE 1/4 SW 1/4
1 S	3 W	WM	6	SE 1/4
1 S	3 W	WM	7	NW 1/4 NE 1/4
1 S	3 W	WM	7	NE 1/4 NW 1/4
1 S	3 W	WM	8	N 1/2 NW 1/4
1 S	3 W	WM	31	NW 1/4
1 S	3 W	WM	31	S 1/2
1 S	3 W	WM	32	SW 1/4
1 S	4 W	WM	1	NE 1/4
1 S	4 W	WM	1	E 1/2 NW 1/4
1 S	4 W	WM	1	S 1/2 SW 1/4
1 S	4 W	WM	1	NE 1/4 SE 1/4
1 S	4 W	WM	1	S 1/2 SE 1/4
1 S	4 W	WM	2	SE 1/4 SE 1/4
1 S	4 W	WM	11	NE 1/4 NE 1/4
1 S	**4 W**	**WM**	**12**	**ALL**
1 S	**4 W**	**WM**	**13**	**N 1/2 NE 1/4**
1 S	**4 W**	**WM**	**13**	**SW 1/4 NE 1/4**
1 S	4 W	WM	13	NW 1/4
1 S	4 W	WM	13	N 1/2 SW
1 S	4 W	WM	13	S 1/2 SW 1/4
1 S	4 W	WM	13	NW 1/4 SE 1/4
1 S	4 W	WM	14	S 1/2 NE 1/4
1 S	4 W	WM	14	SE 1/4 NW 1/4
1 S	4 W	WM	14	E 1/2 SW 1/4
1 S	4 W	WM	14	SE 1/4
1 S	4 W	WM	20	E 1/2 NE 1/4
1 S	4 W	WM	20	NE 1/4 SE 1/4
1 S	4 W	WM	21	S 1/2 NE 1/4
1 S	4 W	WM	21	W 1/2 NW 1/4

Twp	Rng	Mer	Sec	Q-Q
1 S	4 W	WM	21	SE 1/4 SW 1/4
1 S	4 W	WM	21	N 1/2 SW 1/4
1 S	4 W	WM	21	SE 1/4 SW 1/4
1 S	4 W	WM	21	SE 1/4
1 S	4 W	WM	22	S 1/2 SE 1/4
1 S	4 W	WM	23	N 1/2
1 S	4 W	WM	23	SW 1/4
1 S	4 W	WM	23	W 1/2 SE 1/4
1 S	4 W	WM	23	SE 1/4 SE 1/4
1 S	4 W	WM	25	NW 1/4 NW 1/4
1 S	4 W	WM	26	N 1/2 NE 1/4
1 S	4 W	WM	26	W 1/2
1 S	4 W	WM	27	N 1/2
1 S	4 W	WM	27	S 1/2 SW 1/4
1 S	4 W	WM	27	NE 1/4 SE 1/4
1 S	4 W	WM	27	S 1/2 SE 1/4
1 S	4 W	WM	28	N 1/2 NE 1/4
1 S	4 W	WM	28	SE 1/4 NE 1/4
1 S	4 W	WM	28	S 1/2 SE 1/4
1 S	4 W	WM	30	S 1/2 SW 1/4
1 S	4 W	WM	30	S 1/2 SE 1/4
1 S	4 W	WM	31	NE 1/4
1 S	4 W	WM	31	N 1/2 NW 1/4
1 S	4 W	WM	32	S 1/2 NE 1/4
1 S	4 W	WM	32	NW 1/4
1 S	4 W	WM	32	N 1/2 SW 1/4
1 S	4 W	WM	32	SE 1/4
1 S	4 W	WM	33	NE 1/4
1 S	4 W	WM	33	NE 1/4 NW 1/4
1 S	4 W	WM	33	S 1/2 NW 1/4
1 S	4 W	WM	33	N 1/2 SW 1/4
1 S	4 W	WM	33	SW 1/4 SW 1/4
1 S	4 W	WM	34	NE 1/4
1 S	4 W	WM	34	N 1/2 NW 1/4
1 S	4 W	WM	34	SW 1/4 NW 1/4
1 S	4 W	WM	35	N 1/2 NW 1/4
1 S	4 W	WM	35	SW 1/4 NW 1/4
1 S	4 W	WM	35	NE 1/4 SW 1/4
1 S	4 W	WM	35	S 1/2 SW 1/4
1 S	4 W	WM	35	SE 1/4
1 S	4 W	WM	36	E 1/2 NE 1/4
1 S	4 W	WM	36	SE 1/4 NW 1/4
1 S	4 W	WM	36	E 1/2 SW 1/4
1 S	4 W	WM	36	SE 1/4
1 S	5 W	WM	25	NW 1/4 SW 1/4
1 S	5 W	WM	25	S 1/2 S 1/2
1 S	5 W	WM	36	N 1/2 N 1/2
2 S	1 W	WM	5	N 1/2
2 S	3 W	WM	2	E 1/2 SW 1/4

Twp	Rng	Mer	Sec	Q-Q
2 S	3 W	WM	2	SE 1/4
2 S	3 W	WM	3	S 1/2
2 S	3 W	WM	4	ALL
2 S	3 W	WM	5	ALL
2 S	3 W	WM	6	ALL
2 S	3 W	WM	7	E 1/2
2 S	3 W	WM	8	ALL
2 S	3 W	WM	9	ALL
2 S	3 W	WM	10	N 1/2 NE 1/4
2 S	3 W	WM	10	SE 1/4 NE 1/4
2 S	3 W	WM	10	NW 1/4
2 S	3 W	WM	10	SW 1/4
2 S	3 W	WM	11	NE 1/4
2 S	3 W	WM	11	E 1/2 NW 1/4
2 S	3 W	WM	15	S 1/2 NE 1/4
2 S	3 W	WM	15	NW 1/4
2 S	3 W	WM	15	S 1/2
2 S	3 W	WM	16	ALL
2 S	3 W	WM	17	ALL
2 S	3 W	WM	18	ALL
2 S	3 W	WM	19	ALL
2 S	3 W	WM	20	N 1/2
2 S	3 W	WM	20	SW 1/4
2 S	3 W	WM	20	N 1/2 SE 1/4
2 S	3 W	WM	20	SW 1/4 SE 1/4
2 S	3 W	WM	21	ALL
2 S	3 W	WM	22	N 1/2 NE 1/4
2 S	3 W	WM	22	SW 1/4 NE 1/4
2 S	3 W	WM	22	W 1/2
2 S	3 W	WM	22	W 1/2 SE 1/4
2 S	4 W	WM	1	E 1/2
2 S	4 W	WM	1	NE 1/4 NW 1/4
2 S	4 W	WM	2	NE 1/4 NE 1/4
2 S	4 W	WM	2	S 1/2 NE 1/4
2 S	4 W	WM	2	NW 1/4
2 S	4 W	WM	2	S 1/2
2 S	4 W	WM	3	ALL
2 S	4 W	WM	4	E 1/2
2 S	4 W	WM	9	NE 1/4
2 S	4 W	WM	9	E 1/2 SE 1/4
2 S	4 W	WM	10	N 1/2
2 S	4 W	WM	10	SW 1/4
2 S	4 W	WM	10	N 1/2 SE 1/4
2 S	4 W	WM	11	N 1/2
2 S	4 W	WM	11	N 1/2 SW 1/4
2 S	4 W	WM	11	SE 1/4 SW 1/4
2 S	4 W	WM	11	SE 1/4
2 S	4 W	WM	12	ALL
2 S	4 W	WM	13	ALL

Twp	Rng	Mer	Sec	Q-Q
2 S	4 W	WM	14	NE 1/4
2 S	4 W	WM	14	E 1/2 NW 1/4
2 S	4 W	WM	14	E 1/2 SE 1/4
2 S	4 W	WM	24	S 1/2 SE 1/4

Water may be applied to lands which are not specifically described above, provided the holder of this right complies with ORS 540.510(3).

The use of water allowed herein may be made only at times when sufficient water is available to satisfy all prior rights, including prior rights for maintaining instream flows.

Issued NOV 17 2009.

Phillip C. Ward, Director
Water Resources Department

BEFORE THE WATER RESOURCES DIRECTOR OF OREGON

Washington County

IN THE MATTER OF THE APPLICATION OF THE CITY OF HILLSBORO FOR THE APPROVAL OF A CHANGE IN POINT OF DIVERSION OF WATER FROM TUALATIN RIVER

ORDER APPROVING TRANSFER NO. 3130

On September 16, 1974, the City of Hillsboro, Oregon, filed an application in the office of the Water Resources Director for the approval of an additional point of diversion from Tualatin River pursuant to the provisions of ORS 540.510 to 540.530.

Certificate of water right recorded at Page 23540, Volume 17, State Record of Water Right Certificates, in the name of City of Hillsboro, describes an existing right of record for the use of not to exceed 9.0 cubic feet per second from Tualatin River with a date of priority of August 15, 1930, for municipal use within the City of Hillsboro's municipal water supply service area, as follows:

Township 1 North, Range 2 West, W.M.
Section 32
S½
NW¼
Section 33
S½
Section 34
S½
Section 35
S¼
Township 1 North, Range 3 West, W.M.
Section 7
ALL
Section 16
NE¼
Section 17
ALL
Section 18
ALL
Section 19
N½
Township 1 South, Range 1 West, W.M.
Section 1
SE¼
Section 4
E½
Section 5
ALL
Section 6
N½ & SE¼
Section 9
ALL
Section 10
N½
Section 11
N½
Section 12
ALL
Section 13
ALL
Section 24
W½
Township 1 South, Range 2 West, W.M.

$N\frac{1}{2}$
Section 1
$N\frac{1}{2}$
Section 2
$N\frac{1}{2}$
Section 3
$N\frac{1}{2}$
Section 4
$N\frac{1}{2}$
Section 5
$S\frac{1}{2}$
Section 6
$NW\frac{1}{4}$
Section 7
Township 1 South, Range 3 West, W.M.
$E\frac{1}{2}$
Section 12
$N\frac{1}{2}$
$SW\frac{1}{4}$
Section 13
$SE\frac{1}{4}$
Section 14
$NE\frac{1}{4}$
$SW\frac{1}{4}$
Section 23
$W\frac{1}{2}$
Section 26
$E\frac{1}{2}$
Section 27
$N\frac{1}{2}$
Section 31
$NW\frac{1}{4}$
$SE\frac{1}{4}$
Section 32
$NE\frac{1}{4}$
$SW\frac{1}{4}$
Section 33
$N\frac{1}{2}$
Section 34
ALL
Section 35
Township 1 South, Range 4 West, W.M.
$S\frac{1}{2}$
Section 25
$N\frac{1}{2}$
Section 36
Township 1 South, Range 5 West, W.M.

Water for the said right is diverted from the Tualatin River at the Haines Falls Intake at a point located 1100 feet North and 200 feet West from the Southeast corner of Section 20, being within the $SE\frac{1}{4}$ $SE\frac{1}{4}$ of Section 20, Township 1 South, Range 5 West, W.M.

The applicant herein proposes to establish, without loss of priority, an additional point of diversion from the Tualatin River at a point located 500 feet North and 450 feet East from the Southwest corner of Section 8, being within the $SW\frac{1}{4}$ $SW\frac{1}{4}$ of Section 8, Township 1 South, Range 3 West, W.M. (U.S. Bureau of Reclamation, Spring Hill Pumping Plant).

Notice of the application, pursuant to ORS 540.510, was published in the Hillsboro Argus, a newspaper printed and having general circulation in Washington County, Oregon, for a period of three weeks in the issues of January 6, 13 and 20, 1977.

Mr. Clayton J. Gardner, Watermaster of District No. 1, has filed a statement to the effect that the proposed change in point of diversion may be made without injury to existing rights.

No objection having been filed and it appearing that the proposed change in point of diversion may be made without injury to existing rights, the application should be approved.

NOW, THEREFORE, it hereby is ORDERED that the requested change in point of diversion to establish an additional point of diversion from the Tualatin River described herein, without loss of priority, is approved.

It is FURTHER ORDERED that the quantity of water diverted at the new point of diversion shall not exceed the quantity of water available at the old point of diversion, and shall not exceed 9.0 cubic feet per second.

It is FURTHER ORDERED that the following provisions shall be carried out prior to the diverting of water at the new point of diversion as herein confirmed:

> That the diversion works shall include an in line flow meter, a weir, or other suitable device for measuring the water to which the applicant is entitled;
>
> That the type and plans of the measuring device be approved by the watermaster before the beginning of construction work and that the weir or measuring device be installed under the general supervision of said watermaster.

It is FURTHER ORDERED that the construction work shall be completed and the change in point of diversion of water made on or before October 1, 1978.

It is FURTHER ORDERED that upon proof satisfactory to the Water Resources Director of completion of works and beneficial use of water to the extent intended under the provisions of this order, the certificate of water right heretofore issued to City of Hillsboro and recorded at Page 23540, Volume 17, State Record of Water Right Certificates, is canceled, and in lieu thereof a new confirming certificate of water right shall be issued to the City of Hillsboro.

Dated at Salem, Oregon, this 7th day of March, 1977.

James E. Sexson

JAMES E. SEXSON

STATE OF OREGON

COUNTY OF WASHINGTON

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

CITY OF HILLSBORO
123 WEST MAIN
HILLSBORO, OREGON 97123

confirms the right to use the waters of SAIN CREEK, a tributary of SCOGGINS CREEK, for MUNICIPAL SUPPLY.

This right was perfected under Permit 1136. The date of priority is JANUARY 22, 1912. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 3.0 CUBIC FEET PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source. The quantity of water diverted at the new point of diversion, shall not exceed the quantity of water available at the original point of diversion.

The points of diversion is located as follows:

SAIN CREEK (ORIGINAL POINT OF DIVERSION) - SW 1/4 SW 1/4, SECTION 14, TOWNSHIP 1 SOUTH, RANGE 5 WEST, W.M.; 1130 FEET NORTH FROM THE SW CORNER OF SECTION 14;

SCOGGINS CREEK (NEW POINT OF DIVERSION) - NE 1/4 NE 1/4, AS PROJECTED WITHIN MARTIN DLC 52, SECTION 20, TOWNSHIP 1 SOUTH, RANGE 4 WEST, W.M.; 707 FEET SOUTH AND 441 FEET WEST FROM THE NE CORNER OF SECTION 20;

TUALATIN RIVER REDIVERSION - SW 1/4 SW 1/4, SECTION 8, TOWNSHIP 1 SOUTH, RANGE 3 WEST, W.M.; 500 FEET NORTH AND 450 FEET EAST FROM THE SW CORNER OF SECTION 8.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use to which this right is appurtenant is as follows:

THE CITY OF HILLSBORO
WASHINGTON COUNTY
OREGON

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 days of the date of service.

T-6308A.SB

Certificate Number 81026

Water may be applied to lands which are not specifically described above, provided the holder of this right complies with ORS 540.510(3).

If loss of water is determined by the Watermaster, for example seepage or evaporation, the rate of diversion at the new point of diversion shall be reduced by an amount equal to the losses between the old and new points of diversion, or appropriated under another water right.

The City of Hillsboro shall install and maintain a staff gage, an in-line flow meter, weir, or other suitable device for measuring and/or recording the quantity of water diverted at both the old and new points of diversion. The type and plans of the staff gage, headgate, and /or measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

This certificate is issued to confirm a change in POINT OF DIVERSION approved by an order of the Water Resources Director entered MARCH 28, 1991, and supersedes Certificate 1882, State Record of Water Right Certificates.

The issuance of this superseding certificate does not confirm the status of the water right in regard to the provisions of ORS 540.610 pertaining to forfeiture or abandonment.

The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued December 16, 2004.

Phillip C. Ward, Director
Water Resources Department

Recorded in State Record of Water Right Certificates Number 81026.

T-6308A.SB

STATE OF OREGON

COUNTY OF WASHINGTON

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

CITY OF HILLSBORO
123 WEST MAIN
HILLSBORO, OREGON 97123

confirms the right to use the waters of SAIN CREEK, a tributary of SCOGGINS CREEK, for MUNICIPAL SUPPLY.

This right was perfected under Permit 2443. The date of priority is May 1, 1915. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 2.0 CUBIC FEET PER SECOND, or its equivalent in case of rotation, measured at the point of diversion from the source. The quantity of water diverted at the new point of diversion, shall not exceed the quantity of water available at the original point of diversion.

The points of diversion is located as follows:

SAIN CREEK (ORIGINAL POINT OF DIVERSION) - SW 1/4 SW 1/4, SECTION 14, TOWNSHIP 1 SOUTH, RANGE 5 WEST, W.M.; 1130 FEET NORTH FROM THE SW CORNER OF SECTION 14;

SCOGGINS CREEK (NEW POINT OF DIVERSION) - NE 1/4 NE 1/4, AS PROJECTED WITHIN MARTIN DLC 52, SECTION 20, TOWNSHIP 1 SOUTH, RANGE 4 WEST, W.M.; 707 FEET SOUTH AND 441 FEET WEST FROM THE NE CORNER OF SECTION 20; AND

TUALATIN RIVER REDIVERSION - SW 1/4 SW 1/4, SECTION 8, TOWNSHIP 1 SOUTH, RANGE 3 WEST, W.M.; 500 FEET NORTH AND 450 FEET EAST FROM THE SW CORNER OF SECTION 8.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use to which this right is appurtenant is as follows:

THE TOWNS OF GASTON, DILLEY, SOUTH FOREST GROVE, CORNELIUS, HILLSBORO, BEAVERTON, AS WELL AS THE TERRITORY BETWEEN SAID TOWNS AND VILLAGES, IN WASHINGTON COUNTY, OREGON

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 days of the date of service.

T-6308B.SB

Certificate Number 81027

Water may be applied to lands which are not specifically described above, provided the holder of this right complies with ORS 540.510(3).

If loss of water is determined by the Watermaster, for example seepage or evaporation, the rate of diversion at the new point of diversion shall be reduced by an amount equal to the losses between the old and new points of diversion, or appropriated under another water right.

The City of Hillsboro shall install and maintain a staff gage, an in-line flow meter, weir, or other suitable device for measuring and/or recording the quantity of water diverted at both the old and new point of diversion. The type and plans of the staff gage, headgate, and/or measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

This certificate is issued to confirm a change in POINT OF DIVERSION approved by an order of the Water Resources Director entered MARCH 28, 1991, and supersedes Certificate 3930, State Record of Water Right Certificates.

The issuance of this superseding certificate does not confirm the status of the water right in regard to the provisions of ORS 540.610 pertaining to forfeiture or abandonment.

The use confirmed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

Issued December 16, 2004.

Phillip C. Ward, Director
Water Resources Department

Recorded in State Record of Water Right Certificates Number 81027.

T-6308B.SB

STATE OF OREGON

COUNTY OF WASHINGTON

ORDER APPROVING A CHANGE IN POINT OF DIVERSION

Pursuant to ORS 540.510 TO 540.530, after notice was given and no objections were filed, and finding that no injury to existing water rights would result, this order approves TRANSFER 6308 submitted by

THE CITY OF HILLSBORO
123 WEST MAIN
HILLSBORO, OREGON 97123

to use the waters of SAIN CREEK, a tributary of SCOGGINS CREEK, for the purpose of MUNICIPAL USE.

The right to be transferred, as evidenced by certificate 1882, was perfected under Permit 1136 with a date of priority of JANUARY 22, 1912. This right is limited to 3.00 cubic feet per second, or its equivalent in case of rotation, measured at the point of diversion from the source.

The right to be transferred, as evidenced by certificate 3930, was perfected under Permit 2443 with a date of priority of MAY 1, 1915. This right is limited to 2.00 cubic feet per second, or its equivalent in case of rotation, measured at the point of diversion from the source.

The original point of diversion for both rights is located as follows:

SW 1/4 SW 1/4, SECTION 14, T 1 S, R 5 W, W.M.; 1130 FEET NORTH FROM THE SW CORNER OF SECTION 14.

The new point of diversion is located as follows:

NE 1/4 NE 1/4, SECTION 20, T 1 S, R 4 W, W.M.; 707 FEET SOUTH AND 441 FEET WEST FROM THE NE CORNER OF SECTION 20.

This right shall conform to any reasonable rotation system ordered by the proper state officer.

A description of the place of use is as follows:

The towns of Gaston, Dilley, South Forest Grove, Cornelius, Hillsboro, Beaverton, as well as the territory between said towns and villages, in Washington County.

The right to use water for the above purpose is restricted to beneficial use on the lands or place of use described.

THIS CHANGE TO AN EXISTING WATER RIGHT MAY BE MADE PROVIDED THE FOLLOWING CONDITIONS ARE MET BY THE WATER USER:

1. The proposed change shall be completed on or before October 1, 1992.

2. The quantity of water diverted at the new point of diversion, shall not exceed the quantity of water available at the original point of diversion.

3. If loss of water is determined by the watermaster, for example seepage or evaporation, the rate of diversion at the new point of diversion shall be reduced by an amount equal to the losses between the old and new points of diversion, or appropriated under another water right.

4. The City of Hillsboro shall install and maintain a staff gage, an in-line flow meter, weir, or other suitable device for measuring and/or recording the quantity of water diverted at both the old and new points of diversion. The type and plans of the staff gage, headgate, and/or measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

Certificates 1882 and 3930 are hereby canceled. When satisfactory proof of the completed change is received, new certificates confirming these water rights will be issued.

WITNESS the signature of the Water Resources Director, affixed March 28, 1991.

William H. Young

Recorded in Special Order Records at Volume 45, page 171.

T-6308.VRG

APPENDIX E

WATER RIGHT HOLDER STATEMENT

CITY OF HILLSBORO

Water Department

March 17, 2010

Donn Miller
Groundwater Section
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Subject: Hillsboro School District's limited license application for ASR testing

Dear Mr. Miller:

The Hillsboro School District is proposing to develop an aquifer storage and recovery (ASR) project at Liberty High School, and is applying for a limited license to do ASR testing. The School District plans to inject into its well water purchased from Tualatin Valley Water District (TVWD) and provided by the Joint Water Commission (JWC). Injection would occur between November and June, provided that live flow is available. The water will be recovered during the irrigation season for purposes of irrigating the school's playing fields.

The City of Hillsboro (City) is one of the JWC's member agencies and serves as the managing agency. The City is the holder of Certificates 67891, 81026, 81027 and 85913, which are used to provide water to TVWD during the subject November to June period. As the holder of these water rights, the City gives the School District permission to use water under its water rights for ASR testing.

Sincerely,

Niki Iverson
Water Resources Manager

Cc: Loren Rogers, Hillsboro School District
Kimberly Grigsby, GSI Water Solutions, Inc.

150 E. Main Street, Hillsboro Oregon 97123

Office: 503-615-6702
Fax: 503-615-6595

APPENDIX F

LAND USE INFORMATION FORMS

Land Use Information Form

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

NOTE TO APPLICANTS

In order for your application to be processed by the Water Resources Department (WRD), this Land Use Information Form must be completed by a local government planning official in the jurisdiction(s) where your water right will be used and developed. The planning official may choose to complete the form while you wait, or return the receipt stub to you. Applications received by WRD without the Land Use Form or the receipt stub will be returned to you. Please be aware that your application will not be approved without land use approval.

This form is NOT required if:

1) Water is to be diverted, conveyed, and/or used only on federal lands; **OR**
2) The application is for a water right transfer, allocation of conserved water, exchange, permit amendment, or ground water registration modification, and **all** of the following apply:
   a) The existing and proposed water use is located entirely within lands zoned for exclusive farm-use or within an irrigation district;
   b) The application involves a change in place of use only;
   c) The change does not involve the placement or modification of structures, including but not limited to water diversion, impoundment, distribution facilities, water wells and well houses; and
   d) The application involves irrigation water uses only.

NOTE TO LOCAL GOVERNMENTS

The person presenting the attached Land Use Information Form is applying for or modifying a water right. The Water Resources Department (WRD) requires its applicants to obtain land-use information to be sure the water rights do not result in land uses that are incompatible with your comprehensive plan. Please complete the form or detach the receipt stub and return it to the applicant for inclusion in their water right application. You will receive notice once the applicant formally submits his or her request to the WRD. The notice will give more information about WRD's water rights process and provide additional comment opportunities. You will have 30 days from the date of the notice to complete the land-use form and return it to the WRD. If no land-use information is received from you within that 30-day period, the WRD may presume the land use associated with the proposed water right is compatible with your comprehensive plan. Your attention to this request for information is greatly appreciated by the Water Resources Department. If you have any questions concerning this form, please contact the WRD's Customer Service Group at 503-986-0801.

Land Use Information Form

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Applicant: LOREN (First) ROGERS (Last)

Mailing Address: 3083 NE 49TH PLACE

HILLSBORO (City) OR (State) 97124 (Zip) Daytime Phone: (503) 844 1320

A. Land and Location

Please include the following information for all tax lots where water will be diverted (taken from its source), conveyed (transported), and/or used or developed. Applicants for municipal use, or irrigation uses within irrigation districts may substitute existing and proposed service-area boundaries for the tax-lot information requested below.

Township	Range	Section	¼ ¼	Tax Lot #	Plan Designation (e.g., Rural Residential/RR-5)	Water to be:			Proposed Land Use:
1N	2W	14	SE-SW	102	M-2	☒ Diverted	☐ Conveyed	☐ Used	PUB
1N	2W	14	SE-SW	102	M-2	☐ Diverted	☒ Conveyed	☒ Used	PUB
1N	2W	14	SW-SW	102	M-2	☐ Diverted	☒ Conveyed	☒ Used	PUB
1N	2W	23	NE-NW	102	M-2	☐ Diverted	☒ Conveyed	☒ Used	PUB
1N	2W	23	NW-NW		M-2	☐ Diverted	☒ Conveyed	☒ Used	PUB
1N	2W	23	SE-NW	102	M-2	☐ Diverted	☒ Conveyed	☒ Used	PUB

List all counties and cities where water is proposed to be diverted, conveyed, and/or used or developed:

CITY OF HILLSBORO, WASHINGTON COUNTY

B. Description of Proposed Use

Type of application to be filed with the Water Resources Department:

☒ Permit to Use or Store Water ☐ Water Right Transfer ☐ Permit Amendment or Ground Water Registration Modification
☐ Limited Water Use License ☐ Allocation of Conserved Water ☐ Exchange of Water

Source of water: ☐ Reservoir/Pond ☐ Ground Water ☒ Surface Water (name) TUALATIN VALLEY WATER DISTRICT (TVWD)

Estimated quantity of water needed: 100 ☐ cubic feet per second ☒ gallons per minute ☐ acre-feet

Intended use of water: ☒ Irrigation ☐ Commercial ☐ Industrial ☐ Domestic for _____ household(s)
☐ Municipal ☐ Quasi-Municipal ☐ Instream ☐ Other _____

Briefly describe:

THE HILLSBORO SCHOOL DISTRICT IS PROPOSING TO DEVELOP AN AQUIFER STORAGE AND RECOVERY PROJECT AT LIBERTY HIGH SCHOOL, TO SUPPLY WATER TO IRRIGATE THE ATHLETIC FIELDS DURING SUMMER MONTHS. WATER WILL BE PROVIDED BY TVWD, WHICH TVWD OBTAINS FROM THE JOINT WATER COMMISSION (JWC). INJECTION WOULD OCCUR FROM NOVEMBER TO JUNE.

Note to applicant: If the Land Use Information Form cannot be completed while you wait, please have a local government representative sign the receipt at the bottom of the next page and include it with the application filed with the Water Resources Department.

See bottom of Page 3. →

For Local Government Use Only

The following section must be completed by a planning official from each county and city listed unless the project will be located entirely within the city limits. In that case, only the city planning agency must complete this form. This deals only with the local land-use plan. Do not include approval for activities such as building or grading permits.

Please check the appropriate box below and provide the requested information

☑ Land uses to be served by the proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): _____.

☐ Land uses to be served by the proposed water uses (including proposed construction) involve discretionary land-use approvals as listed in the table below. (Please attach documentation of applicable land-use approvals which have already been obtained. Record of Action/land-use decision and accompanying findings are sufficient.) **If approvals have been obtained but all appeal periods have not ended, check "Being pursued."**

Type of Land-Use Approval Needed (e.g., plan amendments, rezones, conditional-use permits, etc.)	Cite Most Significant, Applicable Plan Policies & Ordinance Section References	Land-Use Approval:	
		☐ Obtained ☐ Denied	☐ Being Pursued ☐ Not Being Pursued
		☐ Obtained ☐ Denied	☐ Being Pursued ☐ Not Being Pursued
		☐ Obtained ☐ Denied	☐ Being Pursued ☐ Not Being Pursued
		☐ Obtained ☐ Denied	☐ Being Pursued ☐ Not Being Pursued
		☐ Obtained ☐ Denied	☐ Being Pursued ☐ Not Being Pursued

Local governments are invited to express special land-use concerns or make recommendations to the Water Resources Department regarding this proposed use of water below, or on a separate sheet.

Name: COLIN COOPER Title: CURRENT PLANNING MANAGER

Signature: _____ Phone: 503.681.6230 Date: 4.15.2010

Government Entity: CITY OF HILLSBORO

Note to local government representative: Please complete this form or sign the receipt below and return it to the applicant. If you sign the receipt, you will have 30 days from the Water Resources Department's notice date to return the completed Land Use Information Form or WRD may presume the land use associated with the proposed use of water is compatible with local comprehensive plans.

Receipt for Request for Land Use Information

Applicant name: _____

City or County: _____ Staff contact: _____

Signature: _____ Phone: _____ Date: _____

APPENDIX G

UIC REGISTRATION FOR ASR

DEQ USE ONLY
Received:
Amount Received: $

UNDERGROUND INJECTION CONTROL REGISTRATION
Aquifer Storage & Recover (ASR)

(Submit two copies. See pages 3-4 for detailed instructions.)

Return form with your payment to:
Oregon Department of Environmental Quality
Attn: Business Office
811 SW Sixth Avenue
Portland OR 97204

DEQ DATE STAMP
Registration #:

A. AUTHORIZATION FEE

1. **Number of injection systems 1 x $125.00 = $125.00 (Amount enclosed)**

B. FACILITY NAME, LOCATION & CONTACT

1. Facility's Legal Name: Liberty High School	2. Common Name: Liberty High School
3. Facility Physical Address: 21945 Wagon Way City, State, Zip Code: Hillsboro, OR 97124	4. Facility Mailing Address: 21945 Wagon Way City, State, Zip Code: Hillsboro, OR 97124
5. Consultant Contact Name: GSI Water Solutions, Inc., Larry Eaton Contact Telephone #: (503) 239-8799 ext. 103 Fax #: (503) 239-8940	6. Responsible Official/Owner Name: Hillsboro School District, Loren Rogers Address: 3083 NE 49th Place City, State, Zip Code: Hillsboro, OR 97124

7. Latitude (decimal): **45.564911** Longitude (decimal): **122.902908**

C. FACILITY DESCRIPTION (ATTACH DOCUMENTS AS NEEDED)

1. Oregon Water Resources Dept. Water Site Permit #: NA Discharge rate: NA Discharge volume: NA SIC Code: 611110

   Note: Using City of Hillsboro water (TVWD potable water) for injection

2. Briefly describe the nature of business at this site and list the SIC/NAICS codes: Public high school, 611110

3. Briefly describe the types of materials, products, and wastes handled at the facility, if any. Attach a copy of the Fire Marshall's survey. If available, note if your site qualifies as a small- or large-quantity generator. Attach & sign the UIC no-exposure certification form: ☒ Attached

   No materials, products, and wastes handled at this facility.

4. Name of nearest cleanup site within one-half mile, if any (ESCI, LUST, Superfund, CERCLA): Baker Site - Hillsboro
   Distance to site: 0.25 ☒ Attach map from DEQ Profiler, http://deq12.deq.state.or.us/fp20/.

   No further action required. Phase II Assessment performed in fall of 2008 did not show soil concentrations of metals or pesticides and herbicides that presented a health risk to human or ecological receptors. Therefore, DEQ has made a no further action decision for the site.

5. Land use zoning of facility: ☐ Industrial ☐ Commercial ☐ Residential ☒ Other: Urban

6. Drinking water source: Surface Water: City of Hillsboro water source, TVWD (River name) or Aquifer: _____

7. Is the site located in a groundwater management area (GWMA), steep slope, known hazard area, or flood plain (circle)? ☐ Yes ☒ No

8. Attach nearest drinking water well log (with soil profile) and site maps: ☒ Attached

9. Is this aquifer confined? ☒ Yes ☐ No ☐ Do Not Know Has Department of Human Services (DHS) delineated this area? ☒ Yes ☐ No

   If "YES," attach relevant documentation, such as a vulnerability report and maps from the Oregon Health Division.

10. List any other DEQ or public agency permits applied for or issued to this facility: NA

11. DEQ Reviewer/Contact at regional office: _____

D. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

I hereby certify that the information contained in this registration is true and correct to the best of my knowledge and belief.

Name of Legally Authorized Representative (Type or Print)	**Title**
Signature of Legally Authorized Representative	**Date**

UIC REGISTRATION FOR AQUIFER STORAGE & RECOVERY (ASR) SYSTEMS

Oregon Department of Environmental Quality

(See pages 3 & 4 for detailed instructions)

E. UNDERGROUND INJECTION CONTROL INFORMATION

EPA Well Types

5A19- Cooling Water Return	5R21 -Aquifer Recharge	5W12 Water Treatment Plant Effluent	5X26 Aquifer Remediation
5D2 - Stormwater	5W9 -Untreated Sewage	5W20 Industrial Process Water	5X27 Other Wells
5D4 - Industrial Storm Runoff	5W10 Cesspool	5W31 Septic System (well disposal)	5X28 Motor Vehicle Waste
5G30 Special Drainage Water	5W11 Septic System (gen)	5W32 Septic System (drainfield)	5X29 Abandoned Drinking Well
5A5 - Electric Power Generator	5A6 --Geothermal Heat	5A7 ---Closed Loop Heat Pump Return	5D3 --Drill Hole

Complete the information requested below for each UIC system that is at the facility. Attach additional copies of this sheet if necessary. Also attach a facility map that clearly identifies the location of each UIC by name or number.

UIC SYSTEM # or NAME: Liberty High School Irrigation Well, WASH 58925 **INSTALLATION YEAR: 2002**

1. Latitude (decimal): **45.564911**
   Longitude (decimal): **122.902908**
2. Distance to nearest: Domestic/public water well: about 2,000 feet
   Wetland: 5,800 feet Other surface water(s): 4,800 feet
3. Type: ☒ 5R21 ☐ Other: ____
4. Status: (see instructions for status definition)
   ☒ Planning stage ☐ Under construction ☐ Active
   ☐ Not in use ☐ Temporarily Abandoned
   ☒ Note any monitoring:
   Aquifer test – response of aquifer will be monitored with a pressure transducer in injection well and possibly in a nearby observation well
5. Characteristics:
   Depth: 648 ft Diameter: 0.83 ft
   Design injection rate: 100 gpm (for a 5-day period)
   Location of nearest cleanup site (miles): 0.25
   Impervious Area Drained by UIC: NA
   Pretreatment: Injection water is treated to drinking water standards

UIC SYSTEM # or NAME: _____ **INSTALLATION YEAR:** _____

1. Latitude (decimal): _____
   Longitude (decimal): _____
2. Distance to nearest: Domestic/public water well: _____
   Wetland: _____ Other surface water(s): _____
3. Type: ☐ 5R21 ☐ Other: ____
4. Status: (see instructions for status definition)
   ☐ Planning stage ☐ Under construction ☐ Active
   ☐ Not in use ☐ Temporarily Abandoned
   ☐ Note any monitoring:
   _____
   _____
5. Characteristics:
   Depth: _____ ft Diameter: _____ ft
   Design injection rate: _____
   Location of nearest cleanup site (miles): _____

UIC SYSTEM # or NAME: _____ **INSTALLATION YEAR:** _____

1. Latitude (decimal): _____
   Longitude (decimal): _____
2. Distance to nearest: Domestic/public water well: _____
   Wetland: _____ Other surface water(s): _____
3. Type: ☐ 5R21 ☐ Other: ____
4. Status: (see instructions for status definition)
   ☐ Planning stage ☐ Under construction ☐ Active
   ☐ Not in use ☐ Temporarily Abandoned
   ☐ Note any monitoring:
   _____
5. Characteristics:
   Depth: _____ ft Diameter: _____ ft
   Design injection rate: _____
   Location of nearest cleanup site (miles): _____

To expedite the registration of your facility, please fill out this form in its entirety.

Use this form to register underground injection control (UIC) systems
Common UIC systems include dry wells, sumps, drain holes, infiltration trenches, or infiltration basins.

A. AUTHORIZATION FEE

1. This form will be returned to sender if the fee is not attached or if the form is incomplete.

B. FACILITY NAME, LOCATION & CONTACT

1. Enter the **legal** Oregon corporate name (i.e., Acme Products, Inc.) or the name of the **legal** representative of the company if the company operates under an assumed business name (i.e., John Smith, dba Acme Products). The name must be a legal, active name registered with the Oregon Department of Commerce, Corporation Division (503) 378-4752, unless otherwise exempted by the Department of Commerce regulations.
2. Enter the common name of this facility if different than the legal name.
3. Enter the physical location of the facility (not mailing address), including city, state, and zip code.
4. Enter the mailing address of the facility if different from the physical location.
5. Enter the name, telephone and fax number of the consultant contact; this would be the person to call in case there are any questions about this registration
6. Enter the name and mailing address of the responsible official/owner or organization for this facility.
7. Enter the latitude and longitude of the approximate center of the ASR site in decimal degrees if possible. Latitude and longitude can be obtained by accessing DEQ's web site at http://deq12.deq.state.or.us/fp20/. If a GPS unit is used to determine lat/long, set the datum to the state standard, NAD83; otherwise, location data will not be accurate.

C. FACILITY DESCRIPTION

1. Note the Water Resources Dept. (WRD) reference file number, application number, and license number.
2. Enter the Standard Industrial Classification (SIC) four-digit code **or** North American Industry Classification System five or six-digit code (NAICS) for the facility. These codes are used to describe the primary activity at the facility that generates the most money and may be found on fire marshal reports, insurance papers, or tax forms. The NAICS codes replaced the SIC system in 1997, however, it is usually easy to convert between the two systems so either code is acceptable. SIC or NAICS information is also available from the U.S. Census Bureau at 1-888-756-2427 or at http://www.naics.com/search.htm. Include a secondary code if applicable. Briefly describe the nature of business at the facility. For example, "retail clothing store," "gasoline service station with repair shop," "retail and wholesale cabinet store with cabinet manufacturing," or "rental service store for home, yard, and contractor equipment with in-house maintenance shop."
3. Briefly describe the types of materials, products, and wastes handled at the facility. For example, from a service station one might expect "new and used gasoline, diesel, transmission oil, brake fluid, antifreeze, solvents and tires; general cleaners (409, Simple Green, etc.); office wastes; and general garbage." Submit a list of the water-soluble compounds from the MSDS sheets or a copy of the Oregon State Fire Marshal survey and note if hazardous waste generator. The non-exposure form can be found at http://www.deq.state.or.us/wq/uic/forms.htm.
4. Note if the site has had past contamination problems or if a cleanup site exists within one-half mile. See the DEQ Profiler utility at http://deq12.deq.state.or.us/fp20/.
5. Indicate if the facility is located on property that is zoned for industrial, commercial, residential, or some other use.
6. Indicate the source of drinking water for the site.
7. Indicate whether the site is located in a DEQ groundwater management area, is located on steep slopes, in a floodplain (e.g., flooded in 1996), a groundwater management area, or in a known hazard area (mapped by Oregon Department of Geology, USGS and others). The hazard data should be available at your local planning agency or the Oregon Department of Geology, (503) 731-4100.
8. If you do not have your well log, you may be able to access it through the Oregon Water Resources Department (WRD) web site at http://www.wrd.state.or.us/groundwater/index.shtml, or by calling (503) 986-0900. The Natural Resource Conservation Service in your area may also have this information.
9. Indicate if your local aquifer is confined locally. You may wish to contact a registered geologist, cite US Geological Service report, Water Resources Department study, or the Department of Human Services (DHS) Vulnerability Studies, (541) 726-2587. Note if DHS has delineated the two-year time-of-travel zone through their source water program.
10. In order for DEQ to coordinate with other DEQ offices and public agencies, list all permits applied for or issued to this facility.
11. Please note the regional DEQ office contact (hydrogeologist).

D. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

The signature of a legally authorized representative must be provided in order to process this registration.

Definition of Legally Authorized Representative:
Please also provide the information requested in brackets /]

- **Corporation** — president, secretary, treasurer, vice-president, or any person who performs principal business functions; or a manager of one or more facilities that is authorized in accordance to corporate procedure to sign such documents
- **Partnership** — General partner *[list of general partners, their addresses and telephone numbers]*
- **Sole Proprietorship** — Owner(s) *[each owner must sign the application]*
- **City, County, State, Federal, or other Public Facility** — Principal executive officer or ranking elected official

- **Limited Liability Company** — Member *[articles of organization]*
- **Trusts** — Acting trustee *[list of trustees, their addresses and telephone numbers]*

E.. UNDERGROUND INJECTION CONTROL (UIC) INFORMATION

Please submit a facility map that clearly identifies the location of each UIC system (specific point of discharge or injection, e.g. dry well, sump, drain hole, infiltration trench, etc.) by number or name.

For each UIC system, provide the number or name and its installation date. The installation date will be on your well log or permit. Your city or county building department may also have this information for your site. If the installation date is not known, provide the Oregon Resources Department (WRD) card number and/or the well identification number, or estimate when the UIC system was installed. Also, for **each** UIC system provide the following:

1. Enter the latitude and longitude of the approximate center of each ASR in decimal degrees if possible. Latitude and longitude can be obtained by accessing DEQ's web site at http://deq12.deq.state.or.us/fp20/. If a GPS unit is used to determine lat/long, set the datum to the state standard, NAD83; otherwise, location data will not be accurate..
2. Type of UIC system (listed on top of page 2).
3. Estimated distance in feet of the ASR system to the nearest domestic or public water supply well, wetland, and other surface water.
4. Indicate whether the UIC system is being planned, under construction, active, inactive, temporarily abandoned, or permanently abandoned (closed or decommissioned). A UIC system is considered "temporarily abandoned" when it is taken out of service but still exists. Owners of temporarily abandoned UICs intend to bring them back into service at a future date. A watertight cap or seal that prevents any materials from entering the UIC must cover temporarily abandoned UICs. A UIC is considered "permanently abandoned" when it is completely filled so that movement of water within the UIC is permanently stopped. With the exception of hand-dug UIC systems, a licensed water well constructor, or the landowner under a Landowner's Water Well Permit, must perform a permanent abandonment. Please see Oregon Administrative Rule (OAR) 690-220-0005 or visit WRD's web page for the rule at http://arcweb.sos.state.or.us/rules/OARS_600/OAR_690/690_220.html. WRD has also developed a well guide that may be of use: *A Consumer's Guide to Water Well Construction, Maintenance and Abandonment* available at http://www.wrd.state.or.us/publication/wellcon99/index.shtml#abandoning. You may also contact WRD at (503) 986-0900. If the UIC system has been permanently abandoned/decommissioned, provide the date and method of closure. If you are planning to decommission the system, submit a *DEQ Pre-Closure Notification Form* 30 days before proposed closure.
5. The following design characteristics:
   - Depth and diameter in feet
   - Design injection rate
   - Nearest cleanup site. To find the nearest cleanup site, use DEQ's Profiler utility at http://deq12.deq.state.or.us/fp20/.
   - Size of the impervious area in square feet drained by the UIC system. An impervious area is an area that does not allow rain to soak into the ground. It includes paved areas, concrete pads, buildings, and compacted areas such as graveled or dirt roads. For example, if the UIC system is used for roof drainage, estimate the square footage of the building the roof drain serves.
   - Type of treatment prior to subsurface discharge or BMPs to protect groundwater. For storm drainage systems, this could be a grassy swale, "stormceptor"-type pretreatment devices, catch basin inserts, or other pre-treatment design. It does not include the rocks inside a dry well. If there is no treatment prior to the UIC system, write "no treatment." Please visit DEQ's UIC webpage for more information about pretreatment systems under Storm Water Guidelines.

REGISTRATION SUBMITTAL AND QUESTIONS

Please return this form with your payment to:	For more information, contact:
Department of Environmental Quality Attn: Business Office 811 SW 6th Avenue Portland OR 97204	Barbara Priest, DEQ WQ Division 811 SW 6th Avenue, Portland, OR 97204 Phone (503) 229-5945 Fax: (503) 229-6037

DEQ's UIC web page: http://www.deq.state.or.us/wq/uic/uic.htm

State of Oregon Department of Environmental Quality

Oregon Department of Environmental Quality
811 SW 6th Avenue
Portland, Oregon 97204

NO-EXPOSURE CERTIFICATION For Underground Injection Control

Submission of this No-Exposure Certification constitutes notice that the facility or municipality owning or operating storm water injection systems certifies that the areas with hazardous substances use are not in contact with storm water which is being injected. This certification is required as part of inventory registration to qualify as rule authorized for storm water disposal to an injection system.

A condition of no exposure exists at a site, facility or municipality when all industrial materials and activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, stored or generated toxic or hazardous materials, petroleum products, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. A storm resistant shelter is not required for the following industrial materials and activities:

- drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed" means banded or otherwise secured and without operational taps or valves;
- adequately maintained vehicles used in material handling; and
- final products, other than products that would be mobilized in storm water discharges (e.g., rock salt).

A No-Exposure Certification must be provided for each site or facility as part of the qualifications for rule authorization. If any industrial activities or materials are or will be exposed to precipitation, the facility or site is not eligible for the no-exposure exclusion.

By signing and submitting this No-Exposure Certification form, the entity is certifying that a condition of no exposure exists at its facility or site, and is obligated to comply with the terms and conditions of 40 CFR 122.26(g) and OAR 340-44.

ALL INFORMATION MUST BE PROVIDED ON THIS FORM.

Detailed instructions for completing this form and obtaining the No-Exposure exclusion are provided on page 3 and 4.

A. Facility Operator Information

1. Name: **Loren Rogers- Hillsboro School District** 2. Phone: **503-844-1320**
3. Mailing Address: a. Street/P.O. Box: **3083 NE 49th Place**
   b. City: **Hillsboro** c. State: **OR** d. Zip Code: **97124**

B. Facility/Site Location Information

1. Facility Name: **Liberty High School- Hillsboro School District**
2. a. Street Address: **21945 Wagon Way**
   b. City: **Hilsboro** c. County: **Washington**
   d. State: OR e. Zip Code: **97124**
3. Is the facility located on Indian Lands? Yes ☐ No ☒
4. Is this a Federal facility? Yes ☐ No ☒
5. a. Latitude (decimal): **45.564911** b. Longitude (decimal): **122.902908**
6. a. Was or is the facility or site previously covered under a WPCF permit? Yes ☐ No ☒
   b. If yes, enter WPCF permit number: _____ c. If under an NPDES permit, enter permit number: _____
7. SIC/Activity Codes: **61111** Primary: **0** Secondary (if applicable): _____
8. Total size of site associated with industrial activity: **NA** acres
9. a. Have you paved or roofed over a formerly exposed, pervious area in order to qualify for the No-Exposure exclusion? Yes ☐ No ☒
   b. If yes, please indicate approximately how much area was paved or roofed over. Completing this question does not disqualify you for the No-Exposure exclusion. However, DEQ may use this information in considering whether storm water discharges from your site are likely to have an adverse impact on water quality, in which case you could be required to obtain permit coverage.
   Less than one acre ☐ One to five acres ☐ More than five acres ☐

C. Exposure Checklist

Are any of the following materials or activities exposed to precipitation in the area served by your injection systems, now or in the foreseeable future? (Please check either "Yes" or "No" in the appropriate box.) **If you answer "Yes" to any of these questions, you do not qualify for the No-Exposure certification or rule authorization.**

	Yes	No
1. Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning Industrial machinery or equipment remain and are exposed to storm water	☐	☒
2. Materials or residuals on the ground, in trenches, running into injection systems or in storm water inlets resulting from spills/leaks (e.g. petroleum products)	☐	☒
3. Materials or products from past industrial activity	☐	☒
4. Material handling equipment (except adequately maintained vehicles)	☐	☒
5. Materials or products handling during loading/unloading or transporting activities [e.g. drywell at loading dock]	☐	☒
6. Materials or products stored outdoors (except final products intended for outside use [e.g., new cars] where exposure to storm water does not result in the discharge of pollutants)	☐	☒
7. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers	☐	☒
8. Materials or products handled/stored on roads or railways owned or maintained by the discharger ...	☐	☒
9. Waste material (except waste in covered, non-leaking containers [e.g., dumpsters])	☐	☒
10. Application or disposal of process wastewater (unless otherwise permitted, such as vehicle washing)	☐	☒
11. Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the storm water outflow	☐	☒

D. Certification Statement

I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of "no exposure" to be considered as qualifying for Rule Authorization for storm water injection. I certify under penalty of law that there are no discharges of storm water contaminated by exposure to industrial activities or materials from the industrial facility or site identified in this document (except as allowed under 40 CFR 122.26(g)(2)) and/or OAR 340-44 UIC rules.

I understand that I am obligated to submit a No-Exposure certification form once every five years to DEQ. I understand that I must allow the DEQ permitting authority, where the discharge is to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request.

Additionally, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____

Print Title: _____

Signature: _____

Date:

Who May File a No-Exposure Certification

State law prohibits discharges of storm water associated with industrial activity into waters of the U.S., including groundwater, without qualifying as Rule Authorized or under a permit. However, WPCF permit coverage is not required for discharges of storm water associated with industrial activities if the discharger can certify that a condition of "no exposure" exists at the facility or site.

Obtaining and Maintaining the No-Exposure Exclusion

This form is used to certify that a condition of no exposure exists at the facility or site described herein. This certification is only applicable where DEQ is the UIC permitting authority and must be re-submitted at least once every five years.

The facility operator must maintain a condition of no exposure at its facility or site in order for the No-Exposure exclusion to remain applicable. If conditions change resulting in the exposure of materials and activities to storm water, the facility operator must obtain coverage under a WPCF storm water permit immediately.

Where to File the No-Exposure Certification Form

Mail the completed No-Exposure Certification Form to:
DEQ UIC Coordinator
811 SW 6th Avenue, WQ Division
Portland, Oregon 97204

Completing the Form

You must type or print, using uppercase letters, in appropriate areas only. One form must be completed for each facility or site for which you are seeking to certify a condition of no exposure. Please make sure you have addressed all applicable questions and have made a photocopy for your records before sending the completed form to the above address.

Section A. Facility Operator Information

1. Provide the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this certification. The name of the operator may or may not be the same as the name of the facility. The operator is the legal entity that controls the facility's operation, rather than the plant or site manager.

2. Provide the telephone number of the facility operator.

3. Provide the mailing address of the operator (P.O. Box numbers may be used). Include the city, state, and zip code. All correspondence will be sent to this address.

Section B. Facility/Site Location Information

1. Enter the official or legal name of the facility or site.

2. Enter the complete street address (if no street address exists, provide a geographic description [e.g., Intersection of Routes 9 and 55]), city, county; state, and zip code.

3. Indicate whether the facility is located on Indian Lands.

4. Indicate whether the facility is operated by a municipality, state agency, or a department of the Federal Government.

5. Enter the latitude and longitude* of the approximate center of the facility or site in decimal degrees if possible. Latitude and longitude can be obtained by accessing DEQ's web site at http://deq12.deq.state.or.us/fp20/. If a GPS unit is used to determine lat/long, set the datum to the state standard, NAD83; otherwise, location data will not be accurate.

   *Latitude and longitude for a facility is preferred in decimal form rather than degrees (°), minutes ('), and seconds (") for proper entry on the certification form. To convert decimal latitude or longitude degrees/ minutes/seconds, access the mapping web site listed above.

6. Indicate whether the facility was previously covered under an NPDES or WPCF storm water permit. If so, include the permit number.

7. Enter the 4-digit SIC code which identifies the facility's primary activity, and second 4-digit SIC code identifying the facility's secondary activity, if applicable. SIC codes can be obtained from the Standard Industrial Classification Manual, 1987 or from Federal OSHA's web site at http://www.osha.gov/oshstats/sicer.hmtl.

8. Enter the total size of the site associated with industrial activity in acres. Acreage may be determined by dividing square footage by 43,560, as demonstrated in the following example.

   Example: Convert 54,450 ft^2 to acres

   Divide 54,450 ft^2 by 43,560 square feet per acre:

   $$54{,}450\ ft^2 \div 43{,}560\ ft^2/acre = 1.25\ acres.$$

9. Check "Yes" or "No" as appropriate to indicate whether you have paved or roofed over a formerly exposed, pervious area (i.e., lawn, meadow, dirt or gravel parking lot) in order to qualify for no exposure. If yes, also indicate approximately how much area was paved or roofed over and is now impervious area.

Section C. Exposure Checklist

Check "Yes" or "No" as appropriate to describe the exposure conditions at your facility. If you answer "Yes" to **ANY** of the questions (1) through (11) in this section, a potential for exposure exists at your site and you cannot certify to a condition of no exposure. You must obtain (or already have) coverage under a WPCF storm water permit. After obtaining permit coverage, you can institute modifications to eliminate the potential for a discharge of storm water exposed to industrial activity, and then certify to a condition of no exposure.

Section D. Certification Statement

State statutes provide for penalties for submitting false information on this application form. State regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means:

(i) president, secretary treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or

(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipal, State, Federal, or other public facility: by either a principal executive or ranking elected official.

Where to File This Form

Send Signed Original Document to:
Oregon Department of Environmental Quality (DEQ)
Water Quality Division - LAL
UIC Coordinator
811 SW 6th Avenue
Portland, OR 97204-1390

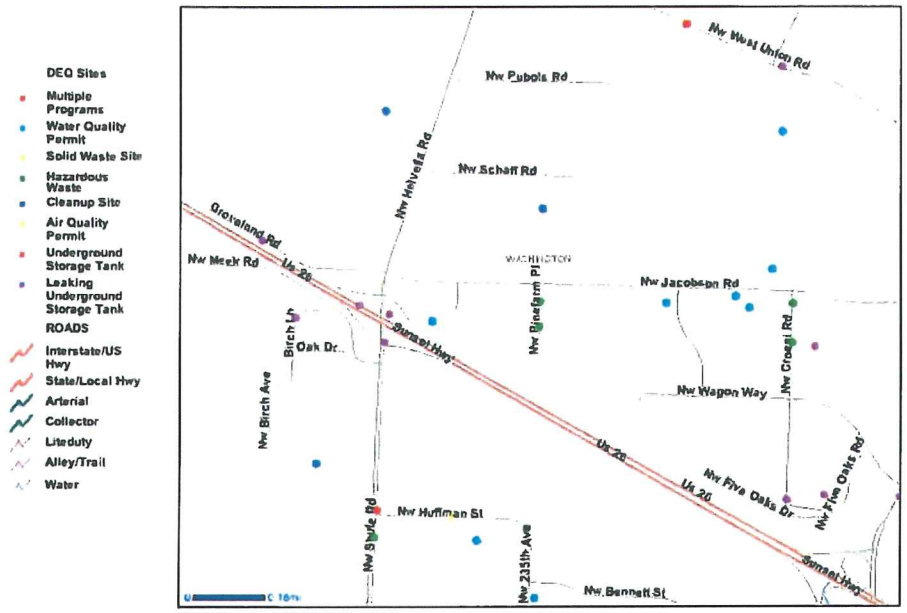
Or Fax to: (503) 229-6037

For office use only – UIC Verification of No-Exposure Certification	
Agency: DEQ Water Quality –UIC Coordinator	UIC #:
Inspection Date: / /	Date Approved: / /
Inspector (Signature):	Inspector (print):

Oregon DEQ Facility Profiler 2.0

[Help] [Close Window]

Image Dimensions (in Pixels). width 600 height 500 Update



[DEQ's Privacy Notice] [Contact DEQ] [Application Feedback]

Disclaimer: *This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user*

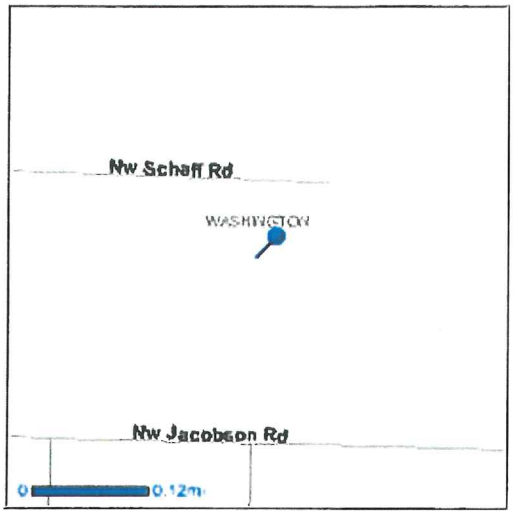
Oregon DEQ Facility Profiler 2.0

[Help] [Close Window]

Facility Summary Report

Return to Site Listing Print Report

Maps



Facility / Site Information for Location 109109

Facility/Site Name:	BAKER SITE - HILLSBORO	**Latitude:**	45° 34' 5.2"
Address:	EAST OF HELVETIA, SOUTH OF SCHAFF RD	**Longitude:**	-122° 55' 5.9"
City State Zip:	HILLSBORO OR 97124	**Location Accuracy:**	HIGH
		Last Updated:	9/22/2008 11:32:06 AM

Aliases

Baker Site - Hillsboro	ECSI

Geographic Features

Township:	T1N-R2W-S0	**Congress Dist:**	1	**Forest Type:**	N/A
County:	WASHINGTON	**OR Senate Dist:**	15	**Vegetation:**	Urban and industrial
Watershed:	TUALATIN	**OR House Dist:**	30	**Agricultural Land:**	PREDOM IRR
Drinking Water Source:		N/A			

Oregon DEQ Program Information

Environmental Cleanup (ECSI)

Operation ID	Start Date	NFA Date	Permit Type	Permit SubType	Status	Detail Information[1]	EPA Number
5082	09/02/2008	02/10/2009	Contaminated Site		No further action required	ECSI Site Report	

[1] Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.
[2] DEQ does not maintain air discharge permit information for Lane County.

More Information on this location

Oregon DEQ Neighborhood Info (by region/county)
See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application
See county's scanned assessor maps through ORMAP

[DEQ's Privacy Notice] [Contact DEQ] [Application Feedback]

Oregon Department of Environmental Quality

Oregon DEQ: Site Details Environmental Cleanup Site Information (ECSI) Database

This report shows data entered as of November 12, 2009 at 5:02:05 PM

This report contains site details, organized into the following sections: 1) Site Photos (appears only if the site has photos); 2) General Site Information; 3) Site Characteristics; 4) Substance Contamination Information; 5) Investigative, Remedial and Administrative Actions; and 6) Site Environmental Controls (i.e., institutional or engineering controls; appears only if DEQ has applied one or more such controls to the site). A key to certain acronyms and terms used in the report appears at the bottom of the page.

Go to DEQ's Facility Profiler to see a site map as well is information on what other DEQ programs may be active at this site.

General Site Information

Site ID: 5082	Site Name: Baker Site - Hillsboro		CERCLIS No:
Address:	Helvetia Road Hillsboro 97124		
	County: Washington		Region: Northwest
Other location information:			
Investigation Status:	No further action required		
	Brownfield Site: Yes	NPL Site: No	Orphan Site: No / Study Area: No
Property:	Twnshp/Range/Sect: 1N , 2E , 15		Tax Lots: 1N21500 00600
	Latitude: 45.5681 deg.	Longitude: -122.9183 deg.	Site Size: 51.2 acres
Other Site Names:			

Site Characteristics

General Site Description:	(CWH/CU&ER 9/22/08) The site is located approximately 1.5 miles south of the Tualatin Mountains. The topography south of the Tualatin Mountains generally slopes down to the south and southwest in shallow valleys. McKay Creek, Holcomb Cree, and Rock Creek are significant drainages from the mountains that flow to the south. A tributary to McKay Creek passes near the subject site before its confluence with McKay Creek about 3.2 miles to the west. The topography in the immediate vicinity of the site slopes down to the west, southwest, and south. The site elevation ranges from an approximate high of 230 feet above mean sea level (msl) in the northeastern corner, to a low of 185 feet msl in the southwestern corner. The inferred direction of regional groundwater flow is to the southwest, based on the topography (USGS Hillsboro, OR, 7.5' Quadrangle). It should be noted that site-specific groundwater flow may fluctuate based on local geology, local well use, and seasonal variations.
Site History:	(CWH/CU&ER 9/22/08) Historical data and interviews indicated that the site has historically been cultivated for agricultural crops. A farm house and barn had been present on-site until 2001 when the dilapidated buildings were

	demolished by a tenant farmer. Agricultural chemicals have been applied to the site's crops historically. However, there is no data documenting past hazardous material storage associated with the former house and barn, though it is likely that household chemicals would have been present. The site has been owned by a few families since 1969 until it was sold to BakerAffordable Homes in 1998. The current owner, Baker Bindewald, purchased the site in October 2006. There were no records of hazardous material releases or storage at the site.
Contamination Information:	
Manner and Time of Release:	
Hazardous Substances/Waste Types:	
Pathways:	
Environmental/Health Threats:	
Status of Investigative or Remedial Action:	(CWH/CU&ER 9/22/08) DEQ reviewed a Phase I Environmental Site Assessment (ESA) in September 2008 as the site was proposed as a possible Certified Industrial Land site. Based on our review of the Phase I ESA, DEQ determined that a Phase II level investigation was warranted to evaluate possible residual levels of pesticides and/or herbicides that might pose a threat to human health and the environment. DEQ recommends this additional work due to the site's historic use for agricultural production and since specific records regarding crops grown and chemicals used was not sufficient to rule out use of persistent pesticides and herbicides that could create exposure risks to future construction workers, site occupants or possible downgradient ecological species. (2/10/09 CWH/SAS) Phase II Assessment performed in fall of 2008 did not show soil concentrations of metals or pesticides and herbicides that presented a health risk to human or ecological receptors. Therefore, DEQ has made a no further action decision for the site.
Data Sources:	

Substance Contamination Information

Substance	Media Contaminated	Concentration Level	Date Recorded
No information is available			

Investigative, Remedial and Administrative Actions

Action	Start Date	Compl. Date	Resp. Staff	Lead Pgm
NO FURTHER STATE ACTION REQUIRED (Primary Action)	02/10/2009	02/10/2009	Charles Harman	SAS

View Full Report Showing Action History

Key to Certain Acronyms and Terms in this Report:

CERCLIS No.: The U.S. EPA's Hazardous Waste Site identification number, shown only if EPA has been involved at the site.
Region: DEQ divides the state into three regions, Eastern, Northwest, and Western; the regional office shown is responsible for site investigation/cleanup.
NPL Site: Is this site on EPA's National Priority List (i.e., a federal Superfund site)? (Y/N).

Orphan Site: Has DEQ's Orphan Program been active at this site? (Y/N). The Orphan Program uses state funds to clean up high-priority sites where owners and operators responsible for the contamination are absent, or are unable or unwilling to use their own resources for cleanup.
Study Area: Is this site a Study Area? (Y/N). Study Areas are groupings of individual ECSI sites that may be contributing to a larger, area-wide problem. ECSI assigns unique Site ID numbers to both individual sites and to Study Areas.
Pathways: A description of human or environmental resources that site contamination could affect.
Lead Pgm: This column refers to the Cleanup Program affiliation of the DEQ employee responsible for the action shown. SAS or SAP = Site Assessment; VCS or VCP = Voluntary Cleanup; ICP = Independent Cleanup; SRS or SRP = Site Response (enforcement cleanup); ORP = Orphan Program.

You may be able to obtain more information about this site by contacting Charles Harman at the Northwest regional office or via email at harman.charles@deq.state.or.us. If this does not work, you may contact Gil Wistar at (503) 229-5512, or via email at wistar.gil@deq.state.or.us or contact the Northwest regional office.

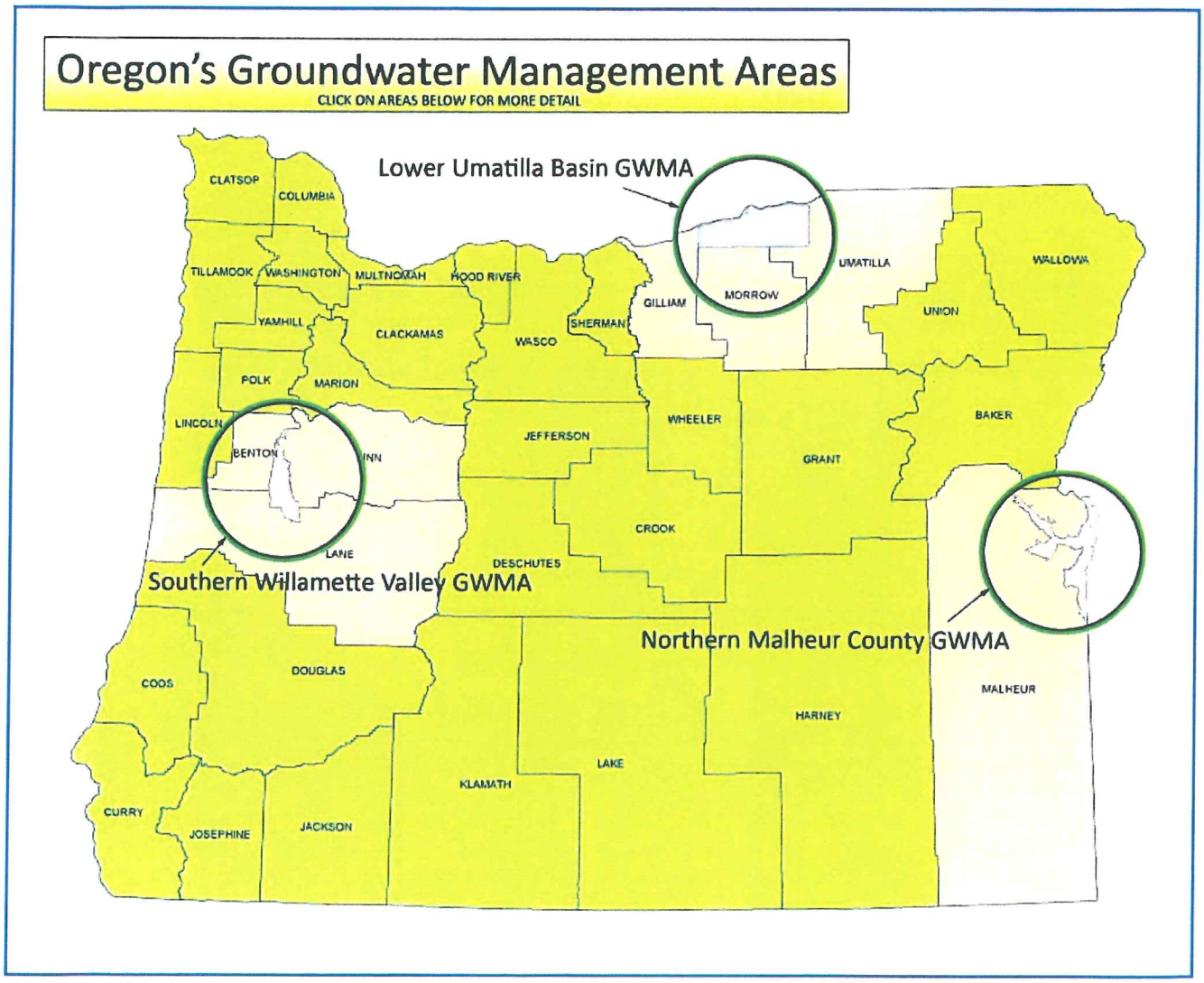
<H1><!-- #BeginEditable "pageTitle" -->Groundwater Management Areas (GWMAs) <!-...

Oregon Department of Environmental Quality

Groundwater Management Areas (GWMAs)

GWMAs are designated by DEQ when groundwater in an area has elevated contaminant concentrations resulting, at least in part, from non-point sources. Once the GWMA is declared, a local Groundwater Management Committee comprised of affected and interested parties is formed. The Committee then works with and advises the state agencies that are required to develop an action plan that will reduce groundwater contamination in the area.

Oregon has designated three GWMAs because of elevated nitrate concentrations in groundwater. These include the Lower Umatilla Basin GWMA, the Northern Malheur County GWMA, and the Southern Willamette Valley GWMA. Each one has developed a voluntary action plan to reduce nitrate concentrations in groundwater.




Wash 54761
Liberty School Well Site
NW Evergreen Rd
NW Evergreen Parkway
NW Brookwood Parkway
NW 185th Ave
Google
Imagery Dates: Jun 23, 2006 - Jul 12, 2007
45 33 42.14" N 122 53 26.16" W elev 232 ft
Eye alt 21212 ft

WASH 58925

RECEIVED
NOV 0 1 2002
WATER RESOURCES DEPT.
SALEM, OREGON

Liberty High School Well

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the reverse side of this form.

WELL I.D. # L 61020
START CARD # 153464

(1) LAND OWNER Well Number ____
Name HILLSBORO SCHOOL DIST.1J (Robinson CONST)
Address 22775 N.W. DOGWOOD ST.
City HILLSBORO State OR Zip 97124

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

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

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

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 648 ft.
Explosives used ☐ Yes ☒ No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
20	0	38	Bentonite	0	38	36 Sacks
15	38	499	Cement	0	85	42 Sacks
			Drillgel	85	400	---
			Cement	400	499	70 Sacks

10 ~~499~~ 648 Method ☐ A ☐ B ☒ C ☒ D ☐ E
☒ Other Poured into annular
Backfill placed from 85 ft. to 400 ft. Material Drill Gel
Gravel placed from ____ ft. to ____ ft. Size of gravel ____

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	16"	0	38	.250	☒	☐	☒	☐
	10"	+1	499	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☒ None
Final location of shoe(s) ____

(7) PERFORATIONS/SCREENS:
☐ Perforations Method ____
☐ Screens Type ____ Material ____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
200		400	1 hr.
240		500	"
275		645	"

Temperature of water 56°F Depth Artesian Flow Found ____
Was a water analysis done? ☐ Yes By whom ____
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☒ Other High Iron
Depth of strata: 500-510 (Cemented off)

(9) LOCATION OF WELL by legal description:
County Washington Latitude ____ Longitude ____
Township 1N N or S Range 2W E or W. WM.
Section 14 SW 1/4 SW 1/4
Tax Lot 102 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) 21945 WAGON WAY, HILLSBORO, OR

(10) STATIC WATER LEVEL:
100 ft. below land surface. Date 10-24-02
Artesian pressure ____ lb. per square inch Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 535

From	To	Estimated Flow Rate	SWL
535	648	275gpm	100'

(12) WELL LOG:
Ground Elevation ____

Material	From	To	SWL
Brn clay	0	26	
Gry clay	26	32	
Sticky gry-brn clay	32	59	
Sticky brn clay	59	71	
Sticky gry clay	71	92	
Coarse brn sand	92	97	
Sticky gry clay	97	194	
Fine to coarse blk sand	194	217	
Sticky blue-gry clay	217	296	
Decomp brn basalt	296	334	
Sticky gry clay	334	434	
Firm brn clay	434	456	
Decomp brn basalt	456	485	
Firm Gry-blk basalt	485	537	W.B.
Hard gry basalt	537	574	100'
Soft blk basalt	574	582	
Firm blk basalt w/clay stone seams.	582	592	
Hard gry basalt occ Frac.	592	648	100'

Date started 10-02-02 Completed 10-24-02

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

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1266
Signed ____ Date 10/25/02

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

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

Wash 54761

JUN 4 1999

WATER RESOURCES DEPT.
SALEM, OREGON

WELL ID # L28233

(START CARD) # 115096

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

(1) OWNER:

Well Number: 578

Name: Steve Chinick

Address: PO Box 245

City: Hillsboro State: OR Zip: 97123

(2) TYPE OF WORK:

[X] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:

[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger
[ ] Other

(4) PROPOSED USE:

[X] Domestic [ ] Community [ ] Industrial [ ] Irrigation
[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval [ ] Yes [X] No Depth of Completed Well 480 ft.

Explosives used [ ] Yes [X] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
10"	0	25	Bentonite	0	25	8 Sacks
8"	25	435	Cement	25	435	
6"	435	480				

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

Backfill placed from ft. to ft. Material

placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+2	435	1/4	[X]	[ ]	[X]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

[ ] Perforations Method
[ ] Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

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

[ ] Pump [ ] Bailer [X] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
30		480	1 hr.

erature of Water 56 Depth Artesian Flow found

Was a water analysis done? [ ] Yes By whom

Did any strata contain water not suitable for intended use? [ ] Too little
[ ] Salty [ ] Muddy [ ] Odor [ ] Colored [ ] Other

Depth of strata:

(9) LOCATION OF WELL by legal description:

County Washington Latitude Longitude

Township 1N N or S. Range 2W E or W. of WM.

Section 14 SW ¼ NE ¼

Tax Lot 700 Lot Block Subdivision

Street Address of Well (or nearest address)
21300 NW West Union Hills Rd., Hillsboro

(10) STATIC WATER LEVEL:

75 ft. below land surface. Date 5/13/99

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 130

From	To	Estimated Flow Rate	SWL
130	150	15	130
370	400	30	100
450	480	30	75

(12) WELL LOG:

Ground elevation

Material	From	To	SWL
Clay Brown	0	20	
Clay & Gravel Brown	20	25	
Clay Brown	25	60	
Clay Blue Gray	60	130	
Sand Cemented Brown	130	150	130
Clay & Gravel Brown	150	290	
Clay Red	290	370	
Basalt Soft Brown	370	400	100
Basalt Gray	400	450	
Basalt Broken Gray	450	480	75

Date started 5/10/99 Completed 5/13/99

(unbonded) Water Well Constructor Certification:

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

WWC Number

Signed Date

(bonded) Water Well Constructor Certification:

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

WWC Number 663

Signed Date 6/2/99

AMERICAN WELL DRILLING

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER

SOURCE WATER ASSESSMENT SUMMARY BROCHURE

JOINT WATER COMMISSION PWS # 4100379 AND HILLSBORO-CHERRY GROVE PWS # 4100985

WHAT IS A SOURCE WATER ASSESSMENT?

The Source Water Assessment was recently completed by the Department of Environmental Quality (DEQ) and the Oregon Department of Human Services (DHS) to identify the surface areas (and/or subsurface areas) that supply water to the Hillsboro Utilities Commission, Beaverton, Forest Grove, and Tualatin Valley Water District Joint Water Commission (JWC) and Hillsboro-Cherry Grove's public water system intakes and to inventory the potential contaminant sources that may impact the water supply.

WHY WAS IT COMPLETED?

The Source Water Assessment was completed to provide information so that the JWC and Hillsboro-Cherry Grove public water system's staff/operator, consumers, and community citizens can begin developing strategies to protect the source of their drinking water, and to minimize future public expenditures for drinking water treatment. The assessment was prepared under the requirements and guidelines of the Federal Safe Drinking Water Act (SDWA).

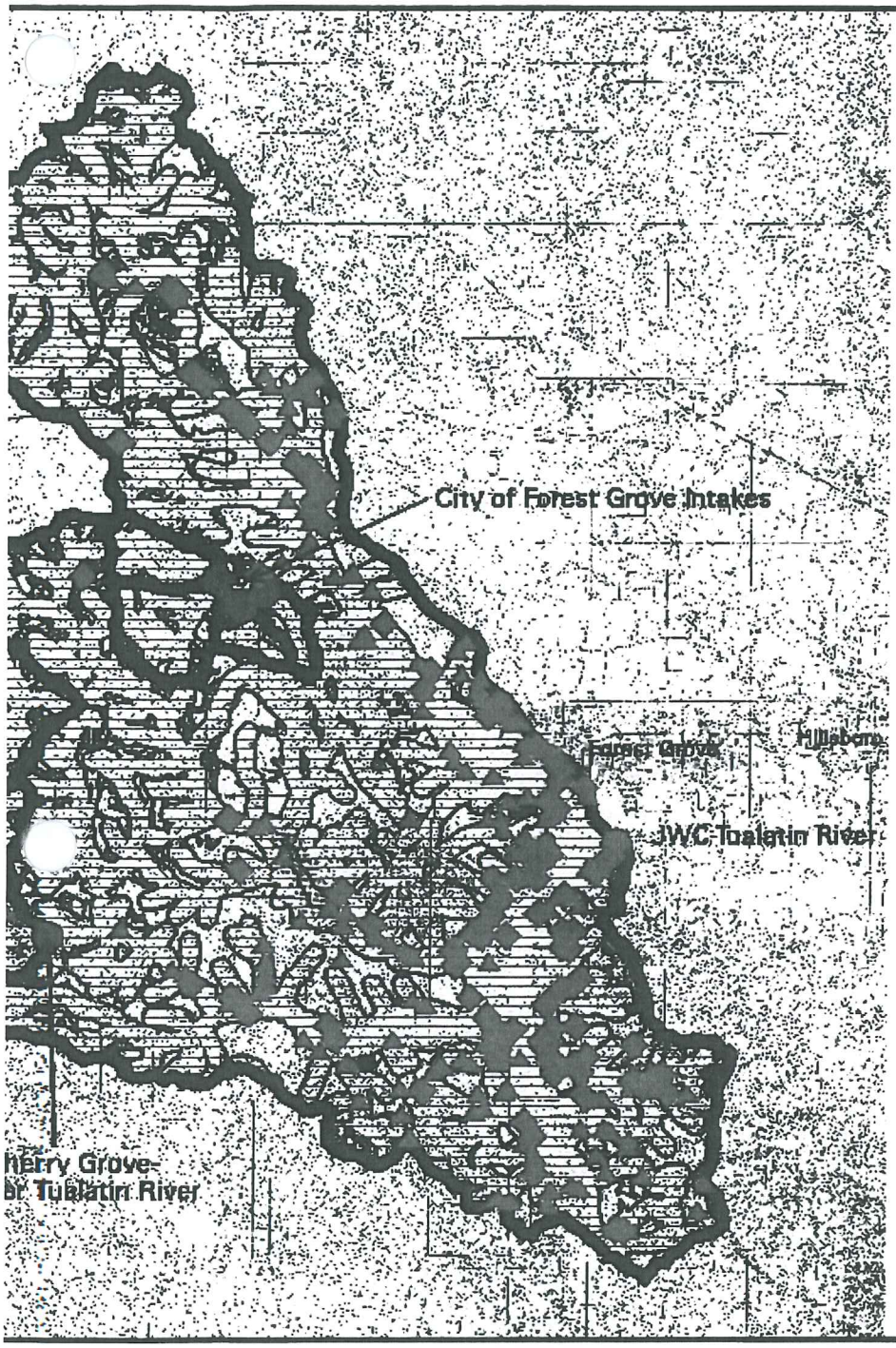
WHAT AREAS ARE INCLUDED IN JWC AND HILLSBORO-CHERRY GROVE 'S DRINKING WATER PROTECTION AREA?

The drinking water for the JWC and Hillsboro-Cherry Grove public water systems is supplied by three intakes located on the Tualatin River, the Upper Tualatin River at Hillsboro Reservoir, and the North Fork Trask River at Barney Reservoir. The drinking water intakes for the City of Forest Grove public water system are located on tributaries to the Tualatin River upstream of the JWC Tualatin River intake. This assessment includes Information for the portion of JWC's protection area upstream of the Forest Grove intakes.

Combined, the JWC and Hillsboro-Cherry Grove public water systems serve approximately 65,350 citizens (65,100 for JWC and 250 for Hillsboro Cherry Grove). The Tualatin River intakes are located in the Gales Creek/Scroggins Creek Watersheds in the Tualatin Subbasin of the Willamette Basin. The North Fork Trask River intake is located in the Trask River Watershed in the Wilson-Trask-Nestucca Subbasin of the Northern Oregon Coastal Basin. The boundaries of the Drinking Water Protection Area are illustrated on the figure attached to this summary.

The geographic area (drinking water protection area) providing water to JWC and Hillsboro-Cherry Grove's intakes includes a cumulative total of 467 stream miles (448 stream miles upstream of the Tualatin River intakes and 19 stream miles upstream of the North Fork Trask intake) and encompasses a total of 220 square miles (212 square miles in the Tualatin Subbasin and 8.2 square miles in the Wilson-Trask-Nestucca Subbasin). Included in this area are a number of tributaries to the Tualatin River main stem including Carpenter Creek, Dilley Creek, Scroggins Creek and Hagg Lake, Ayers Creek, Roaring Creek, Lee Creek, and Sunday Creek.

For surface water systems that encompass an area greater than 100 square miles, such as the area upstream of JWC's Tualatin River intake, DEQ has also estimated the area within an 8-hour time of travel from the intake. The protection area within an 8-hour travel time from the JWC Tualatin River intake extends approximately 7.6 miles upstream. It is recommended that the water systems and community consider increased protection within an 8-hour travel time from the intake since eight hours should provide adequate response time to protect the integrity of the public water system intake should a spill or release occur at any crossing or discharge point to the stream.



Source Water Assessment Results

Joint Water Commission and Hillsboro-Cherry Groves's Drinking Water Protection Area with Sensitive Areas and Potential Contamination Sources

PWS 4100378/4100985

Drinking Water Protection Area

Drinking Water Intake - Surface Water

Sensitive Areas

Area Feature (see Note 2)

Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Note 2: Feature identification markers correspond to the potential contaminant source numbers in the SWA Report. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.

Kilometers

0 1 2 3 4 5 6 7 8

0 1 2 3 4 5

Miles

Map Printed July, 2003

Oregon Department of Environmental Quality GIS

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100379 - JWC and PWS# 4100985 - HILLSBORO-CHERRY GROVE
Commercial/Industrial Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Automobiles - Body Shops		Moderate	1
Automobiles - Car Washes		Moderate	0
Automobiles - Gas Stations		Moderate	2
Automobiles - Repair Shops		Moderate	2
Boat Services/Repair/Refinishing		Higher	0
Cement/Concrete Plants		Moderate	0
Chemical/Petroleum Processing/Storage		Higher	4
Dry Cleaners		Higher	0
Electrical/Electronic Manufacturing		Higher	0
Fleet/Trucking/Bus Terminals		Moderate	3
Food Processing		Moderate	8
Furniture/Lumber/Parts Stores		Moderate	1
Home Manufacturing		Higher	0
Junk/Scrap/Salvage Yards		Higher	3
Machine Shops		Higher	4
Medical/Vet Offices	(1)	Moderate	0
Metal Plating/Finishing/Fabrication		Higher	2
Mines/Gravel Pits		Higher	8
Office Buildings/Complexes		Lower	3
Parking Lots/Malls (> 50 Spaces)		Higher	1
Photo Processing/Printing		Higher	0
Plastics/Synthetics Producer		Higher	0
Research Laboratories		Higher	0
RV/Mini Storage		Lower	1
Wood Preserving/Treating		Higher	0
Wood/Pulp/Paper Processing and Mills		Higher	4
Other: - Equipment Storage		Moderate	1

NOTES:
Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
(1) - Potential source of microbial contamination
(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation
(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4100379 - JWC and PWS# 4100985 - HILLSBORO-CHERRY GROVE

Miscellaneous Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Above Ground Storage Tanks - Excluding Water		Moderate	7
Channel Alterations - Heavy		Lower	0
Combined Sewer Outfalls	(1)	Lower	0
Stormwater Outfalls	(1)	Lower	0
Composting Facilities	(1)	Moderate	0
Historic Gas Stations		Higher	7
Historic Waste Dumps/Landfills	(1)	Higher	1
Homesteads - Rural - Machine Shops/Equipment Maintenance		Higher	10
Homesteads - Rural - Septic Systems (< 1/acre)	(1)(3)	Lower	2
Injection/Dry Wells, Sumps - Class V UICs	(1)	Higher	0
Kennels (> 20 Pens)	(1)	Lower	0
Military Installations		Higher	0
Random Dump Sites		Moderate	0
River Recreation - Heavy Use (inc. campgrounds)	(1)	Moderate	1
Sludge Disposal Areas	(1)	Higher	1
Stormwater Retention Basins	(1)	Higher	1
Transmission Lines - Right-of-Ways		Higher	1
Transportation - Freeways/State Highways/Other Heavy Use		Higher	2
Transportation - Railroads		Higher	1
Transportation - Right-Of-Ways - Herbicide Use Areas		Moderate	0
Transportation - River Traffic - Heavy		Lower	0
Transportation - Stream Crossing - Perennial		Higher	17
UST - Confirmed Leaking Tanks - DEQ List		Moderate	7
UST - Decommissioned/Inactive		Lower	12
UST - Nonregulated Tanks (< 1,100 gals or Large Heating Oil		Higher	0
UST - Not Upgraded and/or Registered Tanks		Higher	0
UST - Upgraded/Registered - Active		Lower	1
UST - Status Unknown		Moderate	4
Upstream Reservoirs/Dams		Moderate	2
Wells/Abandoned Wells		Higher	0
Large Capacity Septic Systems (serves > 20 people) - Class V	(1)	Moderate	9
Construction/Demolition Areas		Higher	3
Other: - DEQ Cleanup Program Site		Higher	3
Other: - Equipment		Moderate	2

NOTES:
Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
(1) - Potential source of microbial contamination
(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation
(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

APPENDIX H

LHS IRRIGATION WELL WELLHEAD DIAGRAM

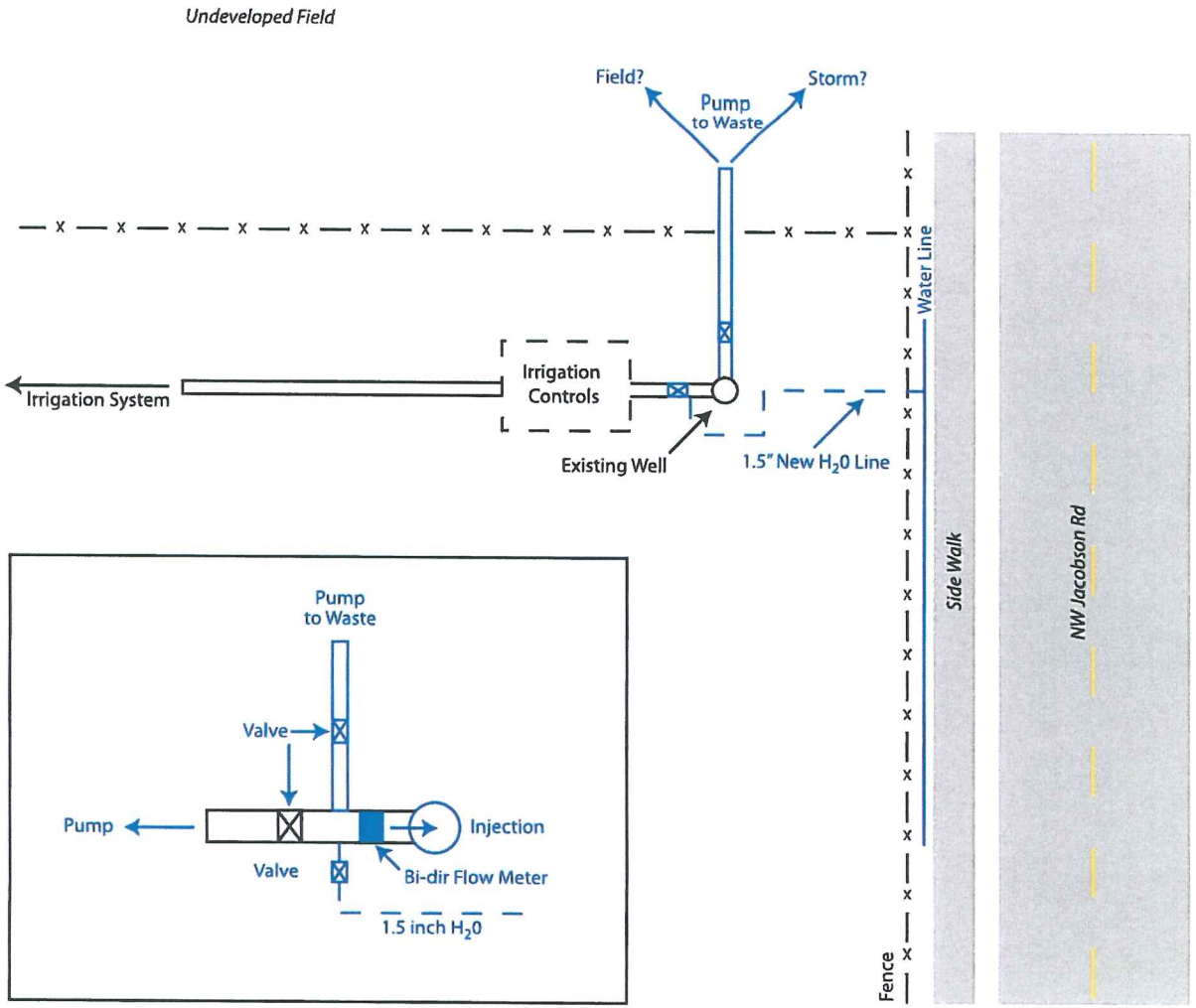


FIGURE 1

Preliminary Schematic Design

Liberty High School
ASR Well

NOTES

Blue:
- New Lines
- 1.5-inch Supply Line
- Isolation Valves
- Bi-dir Flow Meter
- Waste Flow Meter

Function 1:
- Flush supply lines to waste

Function 2:
- Flush well to waste

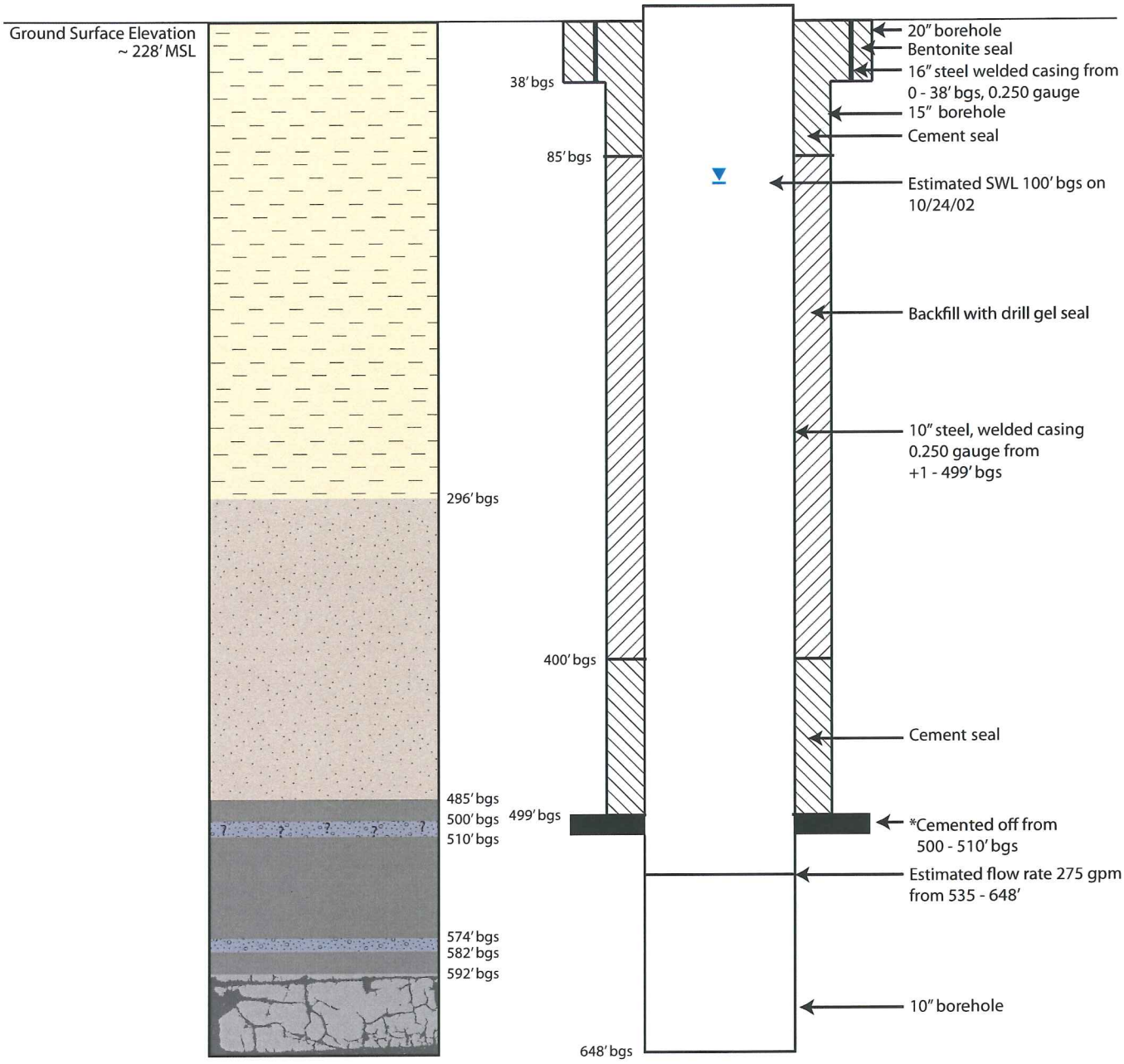
Function 3:
- Inject water down well

Function 4:
- Pump well to irrigation controls

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures

WASH 58925
Liberty High School Irrigation Well



LEGEND

- Clay or Silt
- Decomposing or Soft Brown Basalt
- Firm or Hard Gray-Black Basalt
- Interflow Zone
- Fractured Basalt

NOTES

SWL - Static Water Level
BGS - Below Ground Surface
GPM - Gallons per Minute
* Air pressure was used to force cement into formation after hole had been backfilled with gravel.

FIGURE 2

As-Built and Lithology

Hillsboro School District
Liberty High School ASR Evaluation

GSI Water Solutions, Inc.

P:\Portland\265 - Hillsboro School District\004 - Liberty High School\Figures

APPENDIX I

BASELINE ASR WELL TESTING DATA

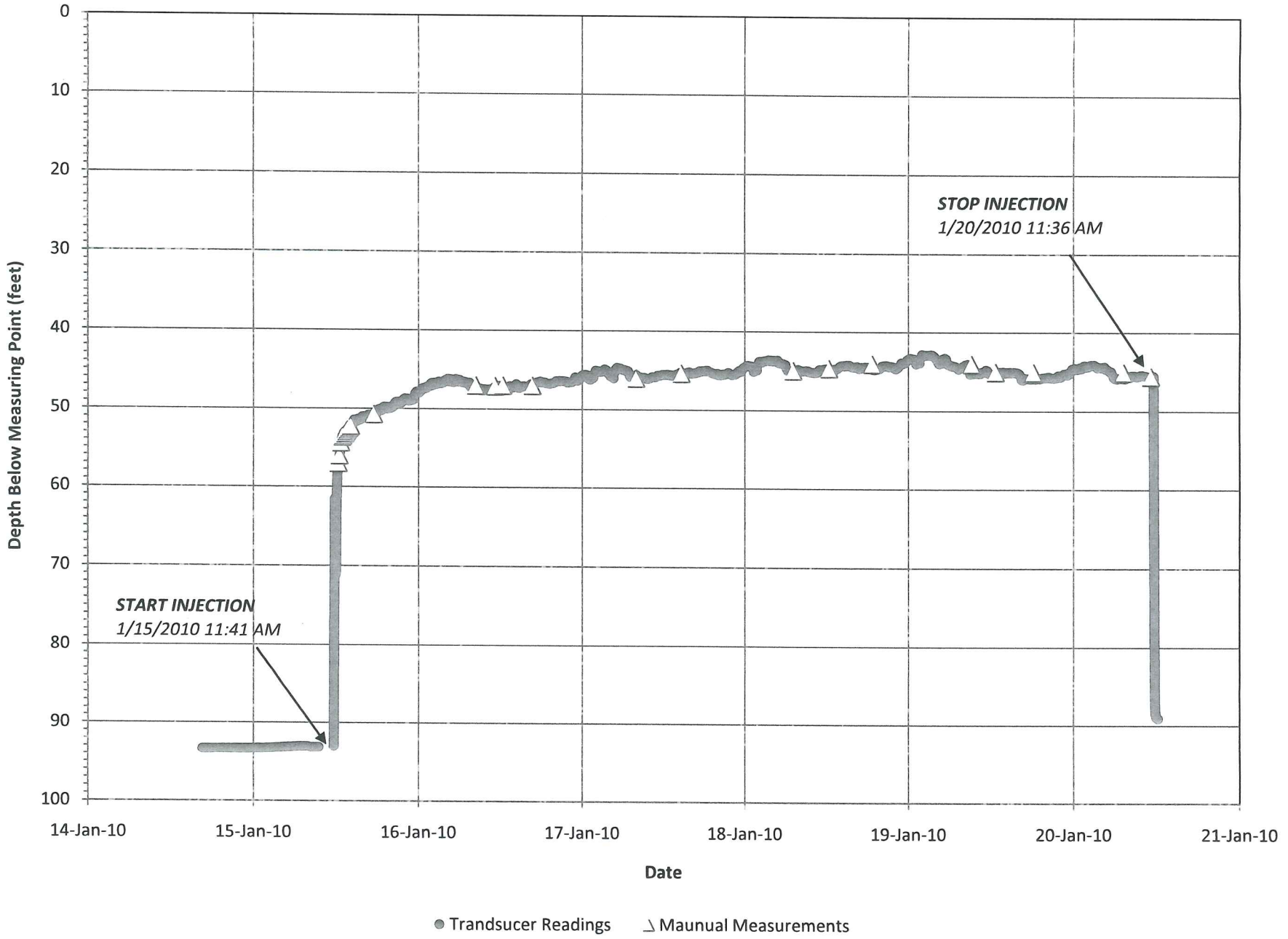
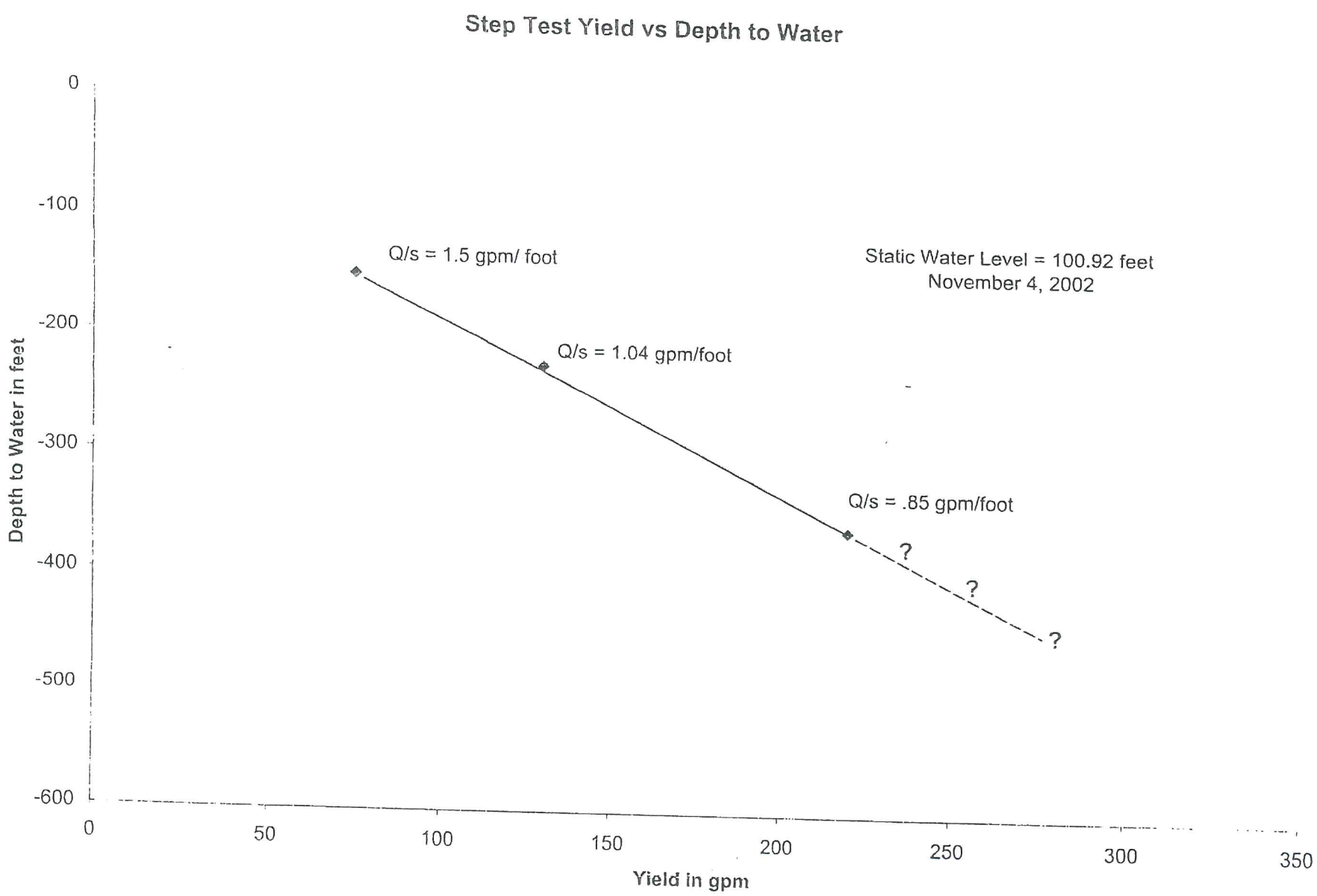


FIGURE 4

Water Level Vs. Time

Hillsboro School District - LHS ASR Evaluation

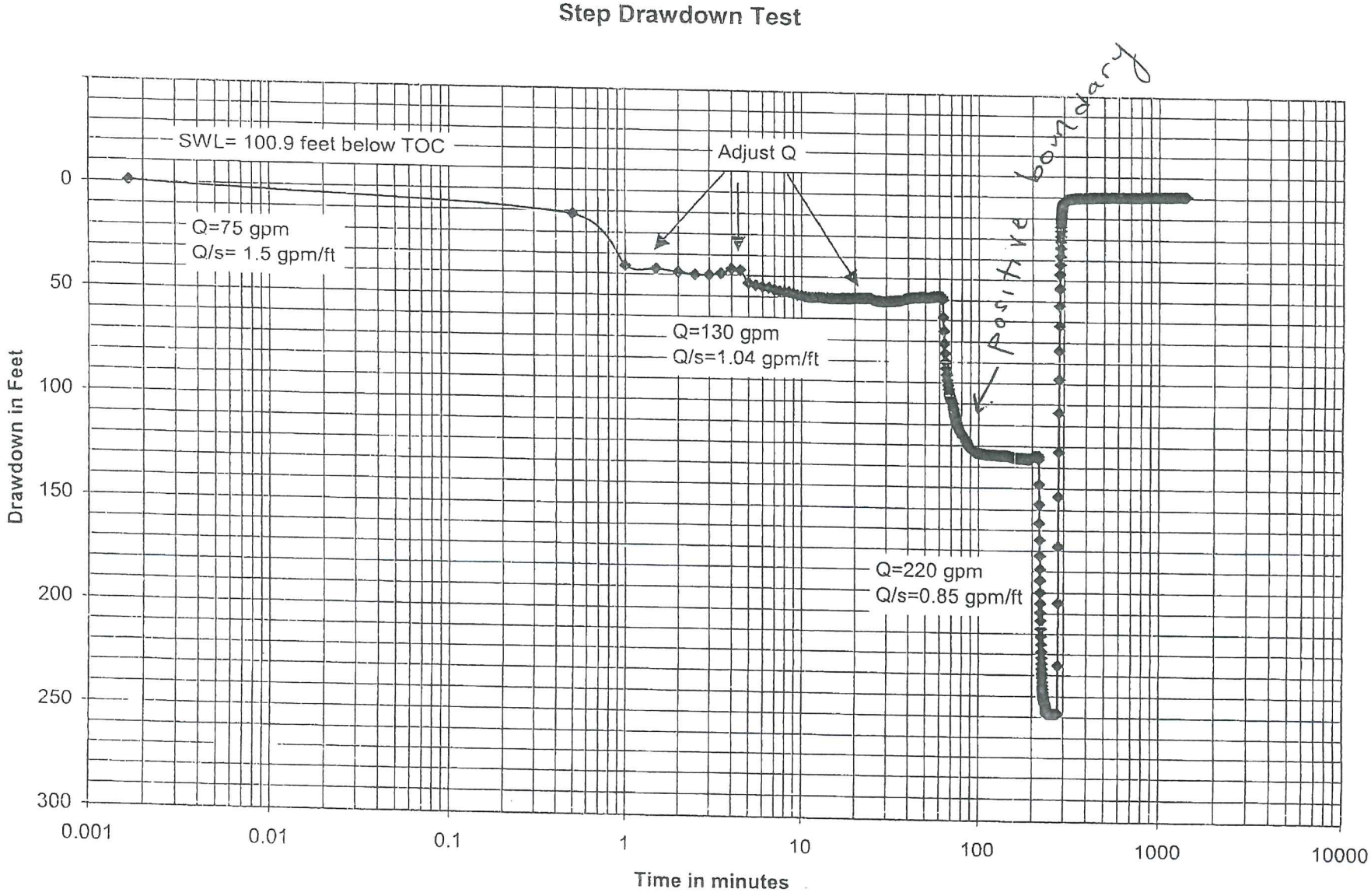


WELL INSTALLATION AND TESTING AT THE LIBERTY SCHOOL SITE

2025024

SHAPIRO & ASSOCIATES, INC

FIGURE 5



WELL INSTALLATION AND TESTING AT THE LIBERTY SCHOOL SITE

2025024

SHAPIRO & ASSOCIATES

FIGURE 4

APPENDIX J

ASR ANNUAL WATER YEAR REPORT FORM

PLEASE SEND COMPLETED FORM TO: OREGON WATER RESOURCES DEPARTMENT, ATTN DONN MILLER, 725 SUMMER STREET NE, SUITE A, SALEM, OR, 97301

Aquifer Storage and Recovery Annual Water Year Report Form Year_____ ASR Cycle Number_____

General Project Information:

Project Location/Title:_____

ASR Limited License #:_____

Dates of Operation:_____

Form Completed by:_____Phone_____

Limited License Conditions:

Maximum Injection Rate:_____

Maximum Recovery Rate:_____

Maximum Storage Volume:_____

Maximum Percentage Recovery:_____Carryover Percentage_____

Annual ASR Operation Information: Please use gallons per minute (gpm) for maximum rate and use gallons for all volume units

Well ID	Injection Start Date	Injection End Date	Max. Injection Rate	Recovery Start Date	Recovery End Date	Max. Recovery Rate	[1]Previous Years Carryover Volume	[2]Volume Injected	[3]Injected Credited	[4]Volume Recovered	[5]Native Groundwater Volume Pumped	[6]Volume Available for Carryover
						Annual Totals						

[1] Previous year carryover volume should be reduced by maximum percentage recovery allowed, typically 95%.
[2] Volume injected is the total volume injected at each well during the current year
[3] Injected credited is the volume injected during the current year reduced by maximum percentage recovery allowed, typically 95%
[4] Volume recovered is the total volume pumped at each well during the current year
[5] Native groundwater volume pumped is the total volume of water pumped beyond the volume available in the ASR storage volume at each well. Pumping beyond the ASR storage volume available at each well requires a water right and maximum pumping rate and volume is restricted by this water right, not the ASR limited license.
[6] Volume available for carryover is the volume of water remaining in storage at each well. This occurs when the volume of water recovered is less than the volume of water available for recovery (injection volume credited plus any carryover water from the previous year).

Water Quality Information:

Note any ASR water quality exceedences in the following table: **NO ASR WATER QUALITY EXCEEDENCES DURING 2008**

Sample Date	Well ID	When Sample Collected (Circle or highlight one)	[1]Analyte Detected above ASR Standard	[2]ASR Action Level (Units)	[3]Analyte Concentration (Units)	Agencies Notified (Circle one)
		Pre-injection/Injection /Storage/ Recovery				YES / NO
		Pre-injection/Injection /Storage/ Recovery				YES / NO
		Pre-injection/Injection /Storage/ Recovery				YES / NO
		Pre-injection/Injection /Storage/ Recovery				YES / NO

[1] Name of analyte that was detected above allowable ASR standard
[2] Provide the allowable concentration of the ASR standard for the analyte detected above standard (include units, ie mg/L, ppm, ppb)
[3] Provide the concentration of the analyte (include units, ie mg/L, ppm,, ppb)

Please attach summary tables containing all water quality data collected during the year in Attachment A.

Please attach lab reports for all sampling conducted during the year in Attachment B.

Please describe any information related to water quality monitoring and any effects of ASR on the host aquifer:

Water Level Information:

Electronic water level data provided to WRD (circle one)? Y/N or Not Required

Well ID	Location of water level measuring point (ex. top of casing, etc) and height above ground surface	[1]Static Water Level (date/feet bmp)	Maximum Water Level During Injection (date/feet bmp)	[2]Water Level Prior to Start of Recovery (date/feet bmp)	Minimum Water Level During Recovery (date/feet bmp)

All water levels should be recorded as depth below measuring point (bmp)
1. Water level should be recorded just prior to initiation of ASR injection
2. Water level should be recorded just prior to initiation of ASR recovery

Please attach a map showing the location of all ASR Wells and Observation Wells in Attachment C.

Please attach plots containing all water level data collected at all ASR Wells during the year in Attachment D.

Please attach plots containing all water level data collected at all Observation Wells during the year in Attachment E.

Please describe any information related to water level observation, including information related to monitoring of springs:

Please provide a general narrative regarding ASR activities during the year, including any well construction/modifications, notable events related to ASR, and/or customer complaints. Additionally, please include information related to project publicity (newspaper reports, public meetings, brochures, or other activities):

Other Information (if applicable):

Please list below any additional monitoring requirements specified by the limited license (if applicable) and provide the required data and information in **Attachment F**. (Examples: specific analyte monitoring, surface water monitoring, etc.)