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CRITICAL AQUIFER RECHARGE AREA ASSESSMENT

Bonney Lake High School Expansion

Prepared for

Sumner-Bonney Lake School District
1202 Wood Avenue
Sumner, WA 98390

Prepared by

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Project: NWW0163

March 11, 2026

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Prepared for

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EXECUTIVE SUMMARY

Geosyntec Consultants, Inc. (Geosyntec; formerly Aspect Consulting), completed a critical aquifer recharge area (CARA) report to support the design and construction of the proposed Bonney Lake High School Expansion (referred to herein as the Project) located at 10920 199th Avenue Court East in Bonney Lake, Pierce County, Washington (Site; Figure 1). The Project proposes to construct a new three-level addition to the existing high school, make improvements to parking and queueing, and convert the surfacing of existing athletic fields from natural grass to synthetic turf. These improvements will result in an increase in stormwater input into the existing stormwater infiltration facility.

The Site lies within a CARA because it lies within the 5-Year time of travel zone (TOT) and wellhead protection area of Grainger Springs, part (Source 02) of the City of Bonney Lake's (City) Group A public water system (Water System ID: 07650H). Additionally, the stormwater infiltration facility on the west side of the property lies partially within the 600-foot travel time of the BSLB Community Well, a Group B water system, and within 1,300 feet[1] of the TOT of two other water systems. This report is intended to satisfy the requirements stated in Section 16.24.040 of the City Municipal Code (Code) regarding Level 1 Hydrogeologic Assessments

Key Conclusions

Based on the results of our assessments, we reached the following conclusions:

- There are two shallow aquifers at the Site in order of depth: the Recessional Outwash (Qvr) Aquifer, and the Advance Outwash Aquifer (Qva), which are separated by the Till Confining Unit (Qvt). Deeper aquifers are present at the Site but are separated from the surface by multiple confining units and are not considered in this report (Welch 2015).
- According to as-built drawings, the existing stormwater infiltration facility is interpreted to infiltrate into the Qvr Aquifer. The Qvr is not extensive in the Project area and is not used as a water source for any known nearby wells, however, available geologic information suggests the confining unit that separates the Qvr from the Qva may pinch out to the west (downgradient) of the Site. This indicates that groundwater can migrate from the Qvr down into the Qva in the Project vicinity. Therefore, the Qva Aquifer is the primary focus of this report.
- Consistent with the Washington State Department of Health (DOH) ratings, the susceptibility of the Qva Aquifer to surface contamination is high due to its shallow water table and permeable hydrogeologic conditions.
- The vulnerability of the Qva Aquifer to long-term cumulative and short-term risk from contamination from the proposed Project is considered to be low provided that the Project is designed in accordance with the *2024 Stormwater Management Manual for Western Washington* (SWMMWW; Ecology 2024), including applicable best management practices (BMPs). This determination is based on the following:

[1] 1,300 feet is stipulated in the City

- There are no known nearby wells completed in the Qva Aquifer downgradient of the infiltration facility.
- The high school expansion does not include hazardous substance storage or underground storage tanks.
- Should a hazardous substance be released onto driveways or roadways, impacts can be mitigated through emergency actions planning and water quality treatment BMPs.

Key Recommendations

We recommend that engineering for the proposed Project should proceed with the following provisions/mitigation measures:

- Construct all stormwater conveyance and facilities in accordance with the SWMMWW and local regulations and implement all applicable BMPs.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

Geosyntec Consultants, Inc. (Geosyntec; formerly Aspect Consulting), completed a critical aquifer recharge area (CARA) report to support the design and construction of the proposed Bonney Lake High School Expansion (Project) in Bonney Lake, Pierce County, Washington (Site; Figure 1). The Site lies within a CARA because it is located within the 5-Year time of travel zone (TOT) and wellhead protection area of Grainger Springs, part (Source 02) of the City of Bonney Lake's (City) Group A public water system (Water System ID: 07650H). Additionally, the stormwater infiltration facility on the west side of the property lies partially within the 600-foot travel time of the BSLB Community Well, a Group B water system. This report is intended to satisfy the requirements stated in Section 16.24.040 of the City Municipal Code (Code) regarding Level 1 Hydrogeologic Assessments

As stipulated in the Code, the purpose of this report is to

- characterize the Site and its relationship to the aquifer;
- discuss the effects of the proposed development activities and their ability to meet the established standards of the City's Code; and
- provide recommendations for any mitigation measures needed to ensure compliance with the standards within the Code.

1.1 Project Description

Based on our review of the current Project plans, dated December 17, 2025, the Project proposes to construct a new three-level addition to the existing high school, to make improvements to parking and queueing (pickup/drop-off areas), and to convert the surfacing of existing athletic fields from natural grass to synthetic turf.

The proposed 16,000-square foot addition is to be located on the south side of the school adjacent to the main entrance. The footprint of the addition will extend into an existing staff parking lot, which will be modified to create a new queueing lane and to relocate parking stalls. Additionally, two existing natural grass softball fields will be converted to a new synthetic turf softball field and synthetic turf multi-use field, and the existing natural grass baseball field will be converted to a synthetic turf baseball field. These improvements will increase the impermeable area associated with the school, however the increased stormwater load will be conveyed to the existing infiltration facility, leading to a net-zero loss in aquifer recharge.

1.2 Climate

The study area experiences the temperate marine climate present throughout region. Summers are warm and dry, and winters are cool and wet with an average annual precipitation of about 45 inches. Seasonally, rainfall is heaviest from November through April and lightest in July and August.

1.3 Methods of Investigation

Geosyntec reviewed existing data and reports to form an understanding of the surface water and groundwater conditions near the Project. Site-specific data collected during production of the geotechnical report (Geosyntec 2026) were supplemented with publicly available surface geology maps (DNR 2026), off-site boring logs (Ecology 2026a), hydrogeologic studies (Welch 2015), and light detection and ranging (LiDAR) maps.

Publicly available data were reviewed by Geosyntec and used to place site-specific data within the regional hydrogeologic context and to assess subsurface conditions beyond the Site.

The presence of public water system supply wells was identified by reviewing the Washington State Department of Health (DOH) Source Water Assessment Program (SWAP) map online (DOH 2026) and the City of Bonney Lake Public GIS Portal (City 2026). Other existing domestic supply wells were identified using the Washington State Department of Ecology's (Ecology) well log database (Ecology 2024a) which are approximated based on their reported PLSS[2] section locations.

No new information was generated for this CARA study.

[2] Public Land Survey System

2. WATER RESOURCES IN PROJECT VICINITY

This section summarizes the existing water supply wells and surface water resources in the Project vicinity. As noted above, the Site is located within the 5-year TOT zone and wellhead protection area of Grainger Springs (Water System ID: 07650H) according to the City's CARA map (Bonney Lake 2026). It is also located within 1,300 feet of the 600-foot TOT zones of three Group B water system wells: BSLB Community Well, Kelly Garden Water System, and Hilltop Water System (DOH 2026).

A map of the Site in relation to the TOT zones is provided in Figure 2. Additional information is provided below.

2.1 Grainger Springs

The City's water system, Bonney Lake Water Department City, is a Group A public water system (Water System ID: 07650H) that is supplied by 10 springs and groundwater wells and an intertie with the Tacoma Water System (Water System ID: 86800). Water system source number 2, Grainger Springs, is located approximately 1.5 miles northwest of the Site. It became active in January 1970 and provides source capacity of up to 1,669 gallons per minute (gpm) to the water system. There are no reported groundwater quality exceedances on record for Grainger Springs (DOH 2026).

Public drinking water supply systems are regulated under the Safe Drinking Water Act (SDWA). DOH regulates Group A systems (15 or more connections) in Washington. Under the SDWA, wellhead protection areas (WHPAs) for public drinking water sources are defined and the susceptibility of wells to contamination is rated. These zones are based on estimated ToT of potential contaminants to the well and were delineated as CARAs by the City and DOH.

The City's GIS Portal shows that the entire Site is located with the 5-year TOT and WHPA of Grainger Springs but does not include an aquifer susceptibility rating or other information. However, DOH has assigned Grainger Springs a TOT of a 1,000-foot radius and includes source susceptibility information. For this report, we will use a conservative hybrid approach: supplement the City's defined TOT with the DOH's susceptibility rating and other information where there are gaps.

The DOH has rated Grainger Springs as highly susceptible to contamination; however, this well is located 1.5 miles away and hydraulically cross-gradient from the Project stormwater infiltration facilities. As discussed in the sections below, the Project is not expected to cause adverse water supply or water quality impacts to Grainger Springs.

2.2 Nearby Group B Water Systems

2.2.1 BSLB Community Well

The BSLB Community Well is a Group B public water system (Water System ID: 01299) that is supplied by one groundwater well. The BSLB well was drilled and constructed in 1979 with 6-inch diameter steel casing to 181 feet below ground surface (bgs) and has no well screen. The well is completed with a surface seal from ground surface to 20 feet bgs. Static water level at the time of construction was approximately 155 feet bgs and the well was tested at 20 gpm with 5 feet of total drawdown after 1 hour of bailing. The DOH has rated the BSLB source as highly susceptible to contamination, and it is located downgradient of the Project stormwater infiltration facility.

2.2.2 Kelly Garden Water System

The Kelly Garden Water System is a Group B public water system (Water System ID: 33121) that is supplied by one groundwater well. The Kelly Garden well was not identified in the Ecology well database, but the 600-foot TOT lies within 1,300 feet of the Site. However, the DOH Sentry Database describes the well as being 203 feet deep and capable of supplying up to 40 gpm. DOH has rated the Kelly Garden source as highly susceptible to contamination, and it is located cross-gradient of the Project stormwater infiltration facility.

2.2.3 Hilltop Water System

The Hilltop Water System is a Group B public water system (Water System ID: 00456) that is supplied by one groundwater well. The Hilltop well was drilled and constructed in 1979 with 6-inch diameter steel casing to 269 feet bgs and 6-inch diameter Johnson welded wire screen between 266 feet and 274 feet bgs. The well is completed with a surface seal from ground surface to 18 feet bgs. Static water level at the time of construction was approximately 204 feet bgs and the well was tested at over 20 gpm with 20 feet of total drawdown after 1 hour of bailing. The DOH has rated the BSLB source as highly susceptible to contamination, and it is located cross-gradient of the Project stormwater infiltration facility.

No other water systems, or other water systems WHPAs, are located within 1,300 feet of the Site.

2.3 Other Domestic Wells in Project Vicinity

Existing domestic supply wells and other existing wells with a 1,300-foot radius of the Site were identified using Ecology's online well log database (Ecology 2026a) and SWAP map (DOH 2026) to support developing a conceptual hydrogeologic framework and evaluation of aquifer conditions and susceptibility. Approximately 17 wells were identified within the 1,300-foot radius, including six water supply wells, and 11 resource protection wells or geotechnical soil borings, as well as one abandoned well. Of the six water supply wells identified, three were associated with the Group B water systems described in the previous section (Hilltop, BSLB Community Well, and Kelly Garden Water System[3]).

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[3] The Kelly Garden Water System well was not found in the Ecology well log database but was identified using the SWAP map to identify the wellhead protection area. Therefore, information is limited on well construction details.

Well locations were verified where possible, but most locations are accurate to the closest PLSS quarter-quarter section. The locations of these wells relative to the Project are presented in Figure 1 and water supply well logs are provided in Appendix A.

2.4 Surface Water in the Project Vicinity

No surface water bodies were identified within 1,300 feet of the Project; however a small portion of Category II wetlands associated with Fennel Creek to the west lie within that boundary (Figure 2). There are also some scattered, small, unnamed wetlands in the Project area.

3. GEOLOGY AND SOILS

The Site is located within the Puget Lowland, a broad area of tectonic subsidence flanked by two mountain ranges: the Cascades to the east and the Olympics to the west. The sediments within the Puget Lowland are the result of repeated cycles of glacial and nonglacial deposition and erosion. The most recent cycle, the Vashon Stade of the Fraser Glaciation (about 13,000 to 16,000 years ago), is responsible for most of the present day geologic and topographic conditions. During the Vashon Stade, the 3,000-foot-thick Cordilleran Glacier advanced into the Puget Lowland.

As the Cordilleran Glacier advanced southward, lacustrine and fluvial sediments were deposited in front of the glacier. Preglacial and proglacial sediments were overridden and consolidated by the advancing glacier, creating dense and hard soil deposits. At the interface between the advance soils and the glacial ice, the Cordilleran Glacier sculpted and smoothed the surface and then deposited a consolidated basal till. As the Cordilleran Glacier retreated northward from the Puget Lowland to British Columbia, it left an unconsolidated sediment veneer over glacially consolidated deposits.

Geologic mapping indicates the Site is underlain by glacial drift, which primarily consists of glacial till (Crandall 1963) in the area. Glacial till is a dense diamict of unsorted, unstratified cobbles, gravel, sand, silt, clay, and occasional boulders deposited directly beneath the glacial ice during the most recent glaciation. As discussed in the following section, the glacial till was observed at the Site and was mantled by fill and native recessional outwash.

Groundwater occurrence and aquifer properties at the Site are discussed in Section 4 below.

4. HYDROGEOLOGY

4.1 Groundwater Occurrence and Aquifer Properties

The groundwater system at the Site is composed of four distinct hydrogeologic units (Figure 5). A hydrogeologic unit (also known as a hydrostratigraphic unit) may be composed of a single geologic unit, or parts of multiple geologic units, grouped into a continuous unit of similar functions and hydraulic properties that act as a single water-bearing entity. Hydrogeologic units with sufficient groundwater flow to adequately serve as potential water supply sources are known as aquifers. Hydrogeologic units that significantly retard, or block groundwater flow, are known as confining units. The hydrogeologic units present at the Site are (in order from shallowest to deepest) as follows:

- The Vashon recessional aquifer (Qvr)
- The Vashon till confining unit (Qvt)
- The Vashon advance aquifer (Qva)
- Confining unit B (QCB)

Deeper hydrogeologic units exist beneath the QCB but are not discussed in this report because they do not present likely targets for stormwater infiltration. Deeper hydrogeologic units are much less at-risk to contamination from surface sources than overlying units due to separation from ground surface by multiple confining units.

4.1.1 Vashon Recessional Aquifer (Qvr)

The Qvr Aquifer is present at land surface throughout the area and comprises stratified silt, sand, and gravel deposited by the northward retreat of the previous glaciation. However, the aquifer is unsaturated at the Site, except for minor water perched on top of the low-permeability till beneath it in the winter months and does not serve as a groundwater source for any known wells within 1,300 feet. This unit is reported (Welch 2015) to have a median hydraulic conductivity (a measurement of permeability) of approximately 200 feet per day (feet/day) and is the receptor soil for the school’s stormwater infiltration facility.

4.1.2 Vashon Till Confining Unit (Qvt)

The Qvt is a confining unit also present at the ground surface in parts of the Project area. The Qvt is dense and composed of unstructured sand, gravel, silt, and clay deposited directly by glacial ice. The physical properties of the till unit can vary widely over short distances and the Qvt in the Project area is reported to have a median hydraulic conductivity of approximately 50 feet/day (Welch 2015). This regional value is biased high due to scattered permeable lenses that can be present in the till, but are not found on Site. The Qvt at the Site is assumed to have a much lower hydraulic conductivity and, based on field observations, acts as a barrier to vertical groundwater flow. The unit varies in thickness across the Site, thinning out near the west end of the Site near the infiltration facility and pinching out completely west of the Project property (AESI 2002). The Qvt limits downward migration of groundwater throughout the Site and Project area, causing infiltrating precipitation to perch on top of the unit. The Qvt is not present immediately west of the Site, allowing precipitation to percolate directly from the Qvr to the Qva aquifer.

4.1.3 Vashon Advance Aquifer (Qva)

The Qva is an aquifer that underlies the Qvt at and near the Site and consists of sandy silt to sandy gravel glacial outwash with trace clay, often arranged in a coarsening-upward sequence. The unit is typically dense and over-consolidated, having been overridden by glacial ice and up to about 100 feet thick in the area. This unit is reported (Welch 2015) to be between 40 and 120 feet thick and have a median hydraulic conductivity of approximately 200 feet/day.

Two wells within 1,300 feet of the Property are interpreted to be completed in the Qva Aquifer: the Frontier Construction and Shirley Coobs wells. Well logs associated with these wells report water levels between 106 and 126 feet bgs, indicating that the Qva is not locally fully saturated. The hydrogeologic study of the area shows that groundwater direction in this aquifer flows west at the Site.

4.1.4 Confining Unit B (QCB)

The QCB is a regionally extensive confining unit present beneath the Qva throughout the Site and Project area and is composed of silts and clays deposited during the Olympia interglacial period and early Vashon Stade. Local wells logs indicate that the thickness of the QCB at the Site is about 40 feet thick and separates the overlying Qva Aquifer from other aquifers beneath it. The QCB greatly retards the vertical migration of groundwater throughout the Project area and does not host significant water.

4.2 Aquifer Completion of Nearby Wells

As discussed above, Geosyntec reviewed the six water supply well logs identified within 1,300 feet of the Site. None of the wells were identified to be completed in the Qvr Aquifer, and two wells were interpreted to be completed in the Qva Aquifer. These two wells (the Frontier Construction and Shirley Coobs wells) were determined to be cross-gradient of the stormwater infiltration facility. The remaining four wells are completed in deeper aquifers below at least one locally extensive confining unit which restricts the downward flow of water and potential contaminants (the QCB unit).

There is no log associated with Grainger Springs, however geological maps and Welch (2015) map the surface as confining Qvt. Since the Qva directly underlies the Qvt, we are assuming for the purposes of this report that the Grainger Springs are sourced from the Qva Aquifer.

Appropriate implementation of BMPs at the Site is expected to greatly mitigate, and potentially eliminate, the risk of contaminants migrating from the Site surface to nearby water supply wells. Section 5 goes into further detail of the proposed BMPs for the Site.

4.3 Groundwater Flow

Water level data compiled from well logs and Welch et al. (2015) show that groundwater within the Qva aquifer generally flows west to southwest from the Site towards the Puyallup River valley where it discharges into the Puyallup River.

4.3.1 Recharge

Infiltrating precipitation is the primary source of recharge to the groundwater system near the Site and throughout Pierce County. Recharge from losing reaches of streams and lakes provide a smaller, but still significant, source of recharge as well. Both sources of recharge are distributed throughout the Project area; enter the groundwater system at or near ground surface; and percolate downward towards deeper hydrogeologic units. Because Qvt is present near ground surface (underlying the Qvr) throughout much of the Project area, most precipitation does not infiltrate. Instead, precipitation may runoff as surface water or shallow groundwater perched on top of the Qvr-Qvt contact and discharge into surface water bodies. However, the existing stormwater infiltration facility outlets to the Qva, so any precipitation that falls on impervious surfaces is routed to the infiltration facility and ultimately provides recharge to the aquifer.

4.3.2 Discharge

Water exits the shallow groundwater system via four primary processes:

1. Seepage into surface water bodies
2. Evaporation and transpiration of shallow groundwater
3. Submarine seepage into Puget Sound
4. Withdrawal via wells

The area is served by municipal (Group A) water systems, some single-household wells, or small shared wells (Group B water systems) located on or immediately adjacent to the property served by that well. Wells are completed in every aquifer in the shallow groundwater system.

Water within the Qva at the Site likely occurs as seepage into Fennel Creek, about 1,600 feet west of the Site, and eventually as discharge into the Puyallup River. Fennel Creek likely represents the receiving water body for all local flow within the Qva at the Site that is not captured by wells and does not continue to percolate downward into the underlying the QCB. Further downward, percolation into the QCB likely occurs throughout the Project area, but the low permeability of the QCB means that this discharge is likely much smaller than the discharge from the Qva into Fennel Creek.

4.3.3 Seasonal Variation in Groundwater Levels

Groundwater levels beneath the Site exhibit seasonal variations correlated with annual and seasonal variations in precipitation. The strength of the correlation is greatest near the surface and grows weaker with increasing depth due to the presence of confining units. While no groundwater monitoring was conducted at the Site, an analysis of water level fluctuations documented in Welch et al.(2015) indicates that water level fluctuations in the Qva average about 4.6 feet (n=57)[4].

[4] The symbol ‘n’ denotes the number of wells or monitoring points used to calculate the average.

4.4 Groundwater Quality

Existing groundwater quality in the Project vicinity was characterized using available information to further document background conditions in the aquifer near the Project. Existing activities and facilities presenting potential sources for contamination were identified and results of water quality analyses from various sources were reviewed.

4.4.1 Nearby Existing Potential Sources of Contamination

Geosyntec reviewed the Ecology database for confirmed and suspected contaminated sites and determined there are none located within 1,300 feet of the Property. Additionally, no contaminant releases near the Property are reported by the EPA Toxic Release Inventory database (TRI; Ecology 2026b). No on-site septic systems were identified within 1,300 feet of the Site.

4.4.2 Existing Water Quality Information

As stated above, the Project includes expanding the high school building and converting grass athletic fields to artificial turf fields, increasing the impermeable surface area of the Site. A review of drainage plans provided by Sitts & Hill (dated October 17, 2025) indicates the additional stormwater generated by these impervious surfaces will be accommodated by the existing on-site infiltration facilities. Therefore, the additional impervious surfaces associated with the Project will not reduce aquifer recharge by precipitation at the Site.

The Project does not include any additional hazardous material storage or increasing traffic on the property. Runoff from roadways can be contaminated with pollutants from vehicles including oil and grease, polycyclic aromatic hydrocarbons (PAHs), lead, zinc, copper, cadmium, sediments (soil particles), road salts, and other deicers. Additionally, landscaping activities associated with the Project can contribute pollutants to runoff including herbicides, pesticides, and nutrients (from fertilizers).

In a hypothetical worst-case scenario, contaminants in larger quantities en-route to the Site could be released onto the roadway in the event of a vehicle accident, for example. If left untreated, these contaminants could impair receiving surface and groundwater or otherwise transported to a receiving water body.

Local background water quality data at the Project site are limited to periodic reporting of water quality sampling by the three local water systems (BSLB, Kelly Garden, and Hilltop water systems).

The BLSB has been sampled for coliform and nitrates since 1988 and last reported the presence of coliform in 2011. Kelly Garden water system has been sampling annually for coliform and nitrates since 1991 and has reported no exceedances. The Hilltop water system has been sampled annually for coliform and occasionally for nitrates and has reported some coliform exceedances as recently as 2025. No water quality data is available on the DOH Sentry Database for Grainger Springs.

4.4.3 Aquifer Susceptibility and Vulnerability

The susceptibility of an aquifer to pollution from contaminants originating at ground surface depends on the characteristics of the contaminant and properties of the vadose zone forming the unsaturated area between the ground surface and the underlying water table. DOH's SWAP database rates the susceptibility of Grainger Springs (in which the property lies within its 5-year TOT zone[5]) and the three Group B water systems within 1,300 feet at the Site (BSLB, Kelly Garden, and Hilltop water systems water systems) to be high.

However, aquifer vulnerability is defined as a combination of aquifer susceptibility (physical attributes of the aquifer, confining layers, and recharge area) and contaminant loading potential resulting from the proposed activity. Therefore, based on our analysis of the aquifer, we conclude that the vulnerability of the aquifer from potential Project-related contamination at the surface is low due to the following

- the Qvr Aquifer is limited in extent near the Site and is not used as a local source aquifer;
- Grainger Springs and the local supply wells that are completed in the Qva are cross-gradient from the infiltration facility;
- the presence of a confining layer (QCB) between the surface aquifers (Qvr and Qva) and the Site aquifers below; and
- the specific and general mitigation measures discussed in Section 5 of this report provide sufficient protection to all water resources in the Project area.

[5] According to the City's CARA map (Bonney Lake, 2026).

5. MITIGATION: BEST MANAGEMENT PRACTICES TO PROTECT GROUNDWATER AND PROMOTE RECHARGE

This section provides recommendations to mitigate potential long-term cumulative and short-term worst-case impacts to the aquifer(s), consistent with the City and Code. Mitigation recommendations were selected to address the potential for negative impacts to groundwater quality resulting from the proposed development under two scenarios:

1. Impacts of routine day-to-day use stormwater facilities
2. A worst-case scenario involving a spill or release of contaminants

Recommended mitigation includes implementation of BMPs. The primary purpose of BMPs is to protect water resources through prevention of contamination, reduction of pollutant concentrations and loads, and/or management of discharge flow rates. Section 3 of the CARA Guidance provides recommendations on protection of the functions and values of critical aquifer recharge areas (Ecology 2021). Step 8 of Section 3 of that document provides recommendations related to recharge within critical aquifer areas, including preference for low impact development techniques to promote recharge.

Low-impact development techniques include surficial infiltration managed as close to the source as possible in order to mimic natural hydrologic conditions. Implementing surficial infiltration BMPs that are appropriately engineered consistent with the SWMMWW should allow for adherence to Ecology's CARA guidance, which allows for uses which do not significantly diminish aquifer recharge. The Project is planning to use bio-retention, storage, and on-site infiltration as a low-impact treatment as part of its stormwater management system.

5.1 Construction Stormwater

5.1.1 Construction Stormwater BMP

Stormwater runoff from construction-related activities should be managed in accordance with Ecology and National Pollution Discharge Elimination System (NPDES) standards, including developing Stormwater Pollution Prevention Plans (SWPPP) and implementing adequate construction stormwater temporary erosion and sediment control BMPs. Construction-related BMPs fall into two main categories: Source Control and Runoff Quantity/Treatment.

Source control BMPs include the preservation of natural vegetation, maintaining buffer zones, high visibility fencing, stake and wire fencing, and stabilizing construction entrances. Temporary runoff conveyance and treatment BMPs include inlet protections, silt fence, interceptor dikes, ditches and swales, grass lined channels, pipe slope drains, level spreaders, silt dikes, straw wattles, sediment traps, and outlet protections.

Selection of adequate temporary source control and runoff conveyance/treatment BMPs for the Site should be made by a qualified designer/engineer and adopted by the Site operator in conjunction with a Certified Erosion and Sediment Control Lead (CESCL).

5.2 Water Quality

5.2.1 Preservation of Natural Drainage, Water Quality Treatment, and Flow Control

Natural drainage patterns should be maintained to the extent practical consistent with Volume II-1 of the SWMMWW. Natural drainage patterns likely consist of a combination of surface water flow and infiltration. Existing drainage patterns should be established through topographic analysis in conjunction with consideration of soil types and existing landcover. Drainage from additional impermeable surfaces should be (and is currently planned to be) routed to existing infiltration facilities.

Stormwater runoff from new impervious pollution-generating surfaces (e.g., pavement and rooftops) should be captured in stormwater treatment and flow-control BMPs to limit surface runoff quantities to pre-existing conditions consistent with hydraulic analyses performed in accordance with Chapter 4 of the SWMMWW. Low impact, infiltration-related BMPs should be evaluated for use in conjunction with the design, provided they can be engineered to prevent degradation of groundwater quality (post-treatment) consistent with CARA Guidance. Examples of minimum basic stormwater treatment and flow control BMPs that may be acceptable for use at this Site include the following:

- BMP T7.10 Infiltration ponds (already present on the Site)
- BMP T7.30 Bioretention

Based on Volume II-3 of the SWMMWW, these facilities are capable of removal and reduction of target pollutants to levels that will not adversely affect public health or beneficial uses of surface and groundwater resources. In addition, removal and reduction of target pollutants will not cause a violation of groundwater quality standards (when properly engineered). It is important to note that the recommended practice when utilizing infiltration facilities includes pretreatment to reduce the occurrence of plugging. Should the local jurisdiction determine that either phosphorus or metals removal is required, additional treatment BMPs may be necessary.

5.2.2 Spill Response Actions

In an unlikely worst-case scenario, a release could occur along the roadway (for example, Schouweiler Tracts Road East) resulting from a vehicle accident. Cleanup of spills would commence immediately after the release initiated by the operator of the vehicle (if commercial) or local fire department and hazardous response teams to contain the release within the paved roadway using spill containment booms and absorbent materials.

Should a release reach a storm drain before the drain could be protected, contaminants could reach the stormwater facility (and potentially the subsurface). In this case, after addressing surface occurrences of spilled products as described above, spill response would include evaluating the potential for free product transport to the subsurface. Releases of free product to the subsurface would be addressed as described in the *Remediation* section below.

5.2.3 Remediation of Potential Subsurface Releases

If liquid products are released to the subsurface, a number of actions can be taken to prevent migration of the products to the underlying aquifer. The extent of the release would be characterized using standard subsurface exploration techniques (such as drilling and soil sampling), and releases to the soil could be mitigated using one or more of the following technologies:

- **Excavation.** Shallow contaminated soil may be excavated and disposed of off-site (e.g., at an appropriate landfill). Given the physical characteristics (relatively viscous liquids) and maximum on-site quantities of most products, products expected to be used on, or transported to, the site are not likely to result in extensive subsurface impacts should they be released to the environment. It is expected that excavation will be suitable to address most potential subsurface releases.
- **Soil Vapor Extraction.** Removal of volatile compounds such as methanol may also be addressed in situ using soil vapor extraction. In this technology, volatile products are removed from the subsurface by applying a vacuum to the underlying soil and extracting and treating the soil vapor.

Given the lack of significant soil above the shallowest water-bearing zone at the Project site, any release should be addressed immediately to avoid reaching groundwater. In the event a release reaches groundwater, contamination could be contained on-site and treated with a number of commonly applied remedial technologies, including the following:

- **Bioremediation.** The products that will be used at the Site are highly biodegradable by native bacteria present in soil and groundwater. Natural removal of products from the subsurface can also be enhanced by adding constituents, such as oxygen, which encourage microbial growth.
- **Air Sparging**. This technology involves removing volatile compounds from groundwater by injecting air into groundwater wells. The vapors are typically collected with a coupled soil vapor extraction system.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The Project lies entirely within a CARA designated by the City, which includes the 5-year TOT of Grainger Springs, a source for the City municipal water system. The infiltration facility at the Site also lies within the DOH-designated 600-foot TOT of BSLB Community Well (a Group B water system), and within 1,300 feet of the 600-foot TOTs of two other Group B water systems (Kelly's Garden and Hilltop water systems). Additionally, three other wells, not associated with a water system, were identified within 1,300 feet of the Project.

The susceptibility of the Qva Aquifer (the primary shallow aquifer at the Site) to surface contamination is considered to be high; however, since groundwater flow in the Qva is interpreted to west to southwest, Grainger Springs, and the wells within 1,300 feet of the Site that are completed in the Qva, are considered to be cross-gradient of the infiltration facility and not vulnerable to Project activities. The other nearby wells are completed in deeper aquifers separated from the surface by multiple confining units.

In light of the above information, the risk of contamination to the aquifers (vulnerability) at the proposed Project site is considered to be low. Any potential long- or short-term risk to the aquifers from surface contamination will be mitigated by proper application of BMPs consistent with the SWMMWW and recommendations in this report.

6.2 Recommendations

We recommend that engineering for the proposed Project should proceed with the following provisions/mitigation measures:

- Construct any additional stormwater catchments and conveyance in accordance with the SWMMWW and local regulations and implement all applicable BMPs.
- Direct or convey all stormwater generated by the Project to the existing infiltration facilities as currently planned.

7. REFERENCES

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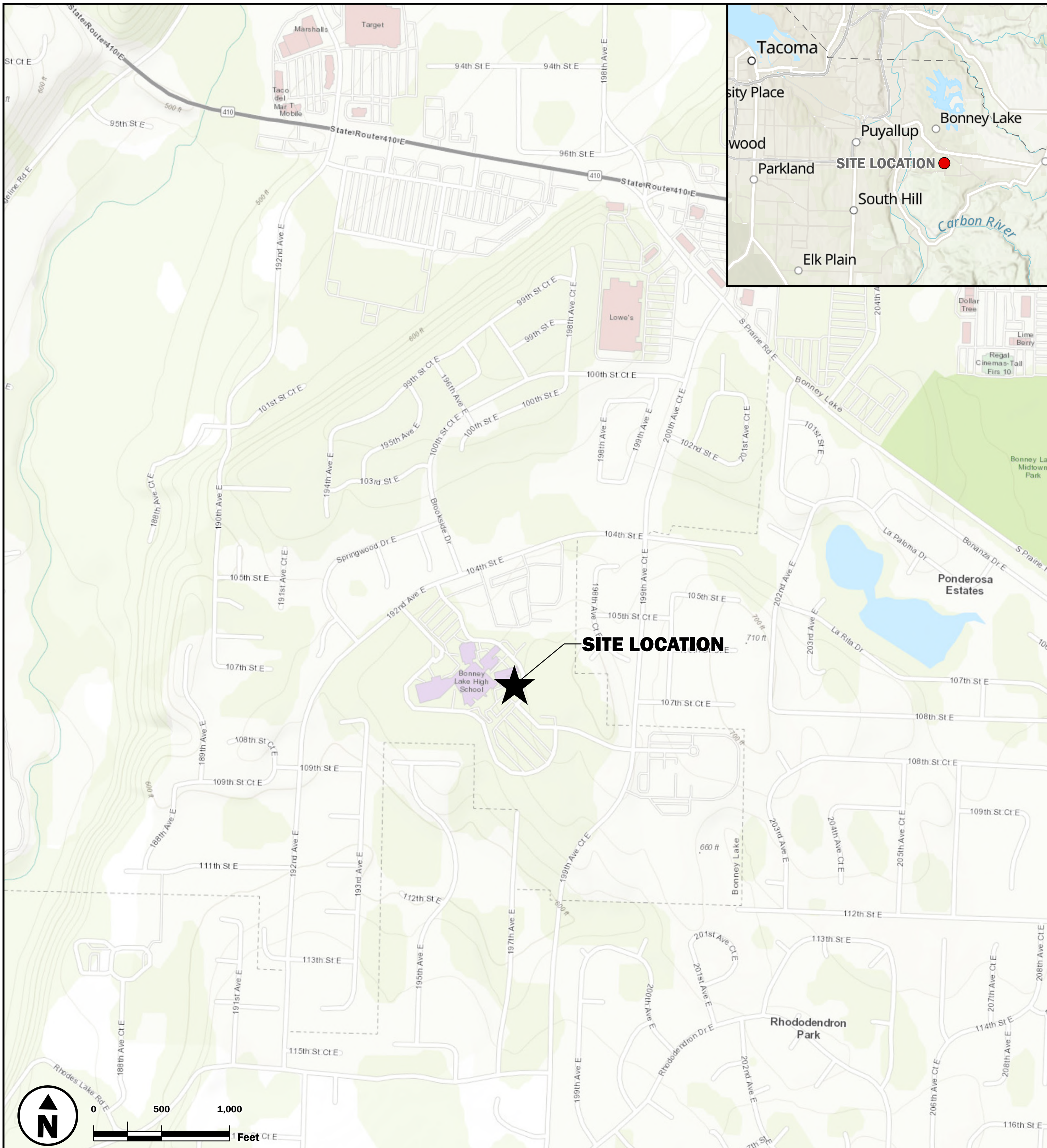
FIGURES



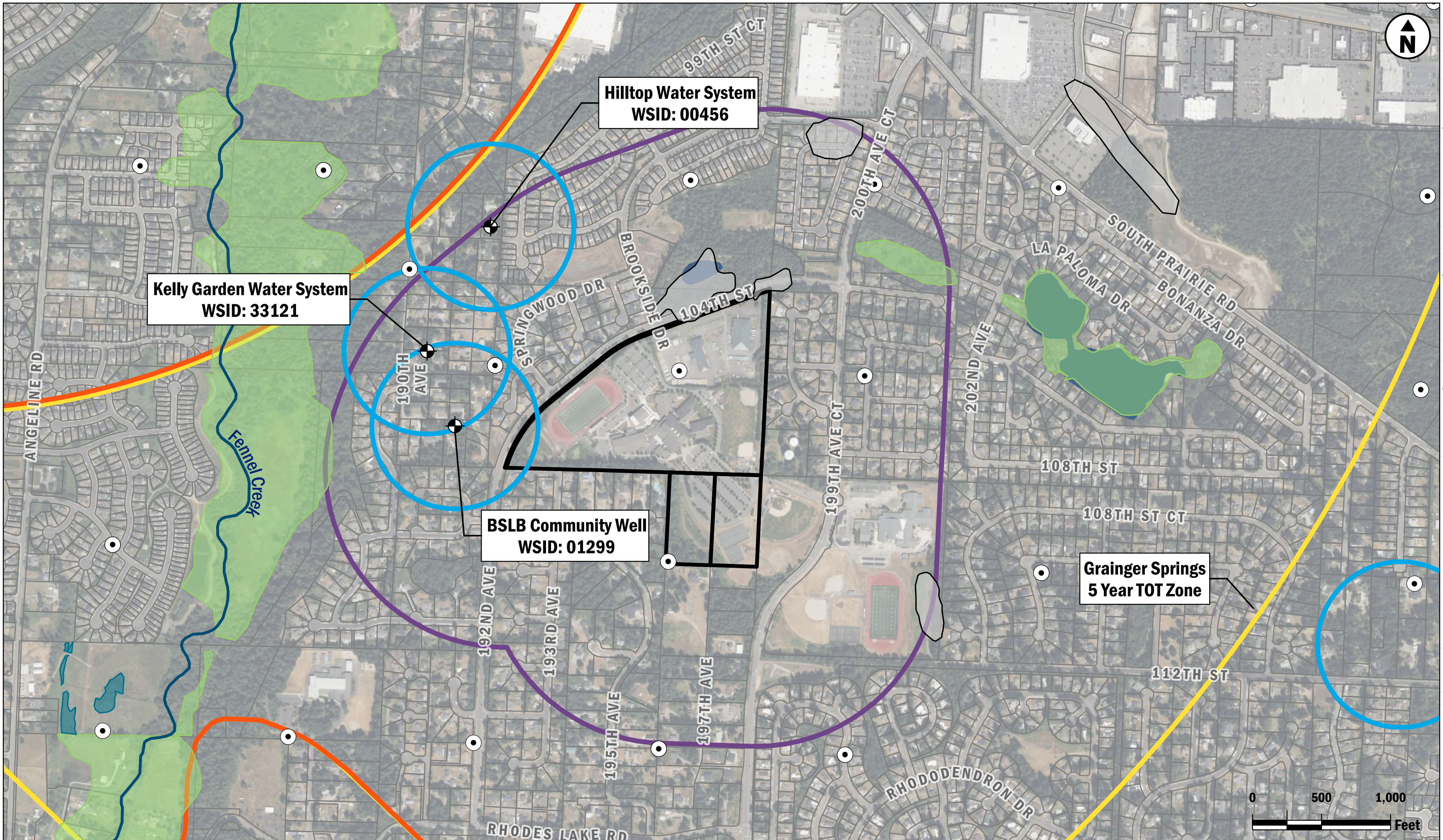
Vicinity Map

Bonney Lake High School Expansion
Bonney Lake, Washington

Geosyntec consultants	MAR-2026	BY: MML / KMJ	FIGURE NO.
	PROJECT NO. NWG0163	REVISED BY: - - - / - - -	1

Data source credits: None || Basemap Service Layer Credits: © OpenStreetMap contributors, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, WSDOT, Esri, HERE, Garmin, USGS, EPA, Esri, USGS, County of King, Bureau of Land Management, Esri Canada, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA

GIS Path: G:\projects\BonneyLakeHighSchool_NWG163\Delivered\BonneyLakeHighSchool_NWG163\BonneyLakeHighSchool_NWG163.aprx; 01 Vicinity Map || User: Kristen.Jurica || Print Date: 1/26/2026



GIS Path: G:\projects\BonneyLakeHighSchool_NWG163\Delivered\BonneyLakeHighSchool_NWG163\BonneyLakeHighSchool_NWG163.aprx: 02 Wellhead Protection Areas || User: Kristen.Jurica || Print Date: 1/23/2026

Bonney Lake High School Property
High School 1300-ft Buffer

WA DNR Hydrography
- Stream
- Waterbody
- Water System Well Location
- Ecology Well Log Report

DOH Time of Travel Zone
- 600 Feet

City Time of Travel Zone
- 5 Year
- 1 Year

County Wetland Inventory
- Category II
- Category III
- Unknown
- Pierce County Tax Parcel

Wellhead Protection Areas

Bonney Lake High School Expansion
Bonney Lake, Washington

Geosyntec consultants	MAR-2026	BY: MML / KMJ	FIGURE NO. 2
	PROJECT NO. NWG0163	REVISED BY: - - - / - - -	

Data source credits: City of Bonney Lake, WA DOH, WA DNR, WA ECY, Pierce County || Basemap Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

APPENDIX A
Nearby Well Logs

04-28-98 05:36PM FROM HOLT TESTING, INC. P02

RECEIVED

MAY 01 1998

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W20726

Unique Well ID #

Water Right Permit No.

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

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

(1) OWNER: Name City of Bonney Lake Address PO BOX 7380 Bonney Lk WA 98390

(2) LOCATION OF WELL: County Pierce — NW ¼ SW ¼ Sec. 3 T. 19N N., R. 5E W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 1500 ft N and 100 feet E of SW corner of sec 3

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

(4) TYPE OF WORK: Owner's number of well (if more than one) Well 5
Abandoned ■ New well ☐ Deepened ☐ Reconditioned
Method: ☐ Dug ■ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted

(5) DIMENSIONS: Diameter of well 16 inches. Drilled 722 feet. Depth of completed well 434 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 16 " Diam. from +2.7 ft. to 396 ft.
■ Welded " Diam. from ft. to ft.
☐ Liner installed " Diam. from ft. to ft.
☐ Threaded

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

Screens: ■ Yes ☐ No
Manufacturer's Name Johnson
Type stainless, wire Model No.
Diam. 16" T Slot size 60 from 396 ft. to 411 ft.
Diam. 16" T Slot size 60 from 419 ft. to 429 ft.
Diam. Slot size from ft. to ft.

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

Surface Seal: ■ Yes ☐ No To what depth? 20 ft.
Material used in seal Cement grout
Did any strata contain unusable water? ☐ Yes ■ No
Type of water? Depth of strata
Method of sealing strata off

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

(8) WATER LEVELS: Land-surface elevation above mean sea level 700 ft.
Static level 256.1 ft. below top of well Date 2/4/94
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 45 gal./min. with 75 ft. drawdown after 1½ hrs.
Airtest gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ■ Yes ☐ No

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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

MATERIAL	FROM	TO
Brown silty gravel & sand	0	5
Tan cobbley till	5	45
Dry, clean sand, gravel & cobbles	45	72
Silty sand, gravel & cobbles	72	79
Brown clean sand, gravel and cobbles	79	161
Silty gravel, cobbles and sand	161	178
Tan siltbound sand & gravel	178	186
Brown silty sand and gravel, some cobbles	186	207
Brown silty fine to coarse sand, few small gravels, w.b. below 230'	207	272
Layered gray silty clay and gravel, and silty, gravelly clay	272	347
Gray gravelly silt, some wood	347	386
Layered sand and gravel with silt	386	396
Gray/brown siltbound gravel & sand, cobbles	396	406
Brown siltbound sand and gravel	406	444
Tight sand, gravel and silt	444	458
Brown sandy silt & clay, with gravel	458	464
Brown siltbound sand and gravel	464	520
Mostly brown tight sand and gravel with siltbound layers	520	549
Brown siltbound gravel and sand	549	598
Brown siltbound sand and gravel	598	640
Silt/claybound gravel and sand	640	678
Gray/green silty clay with some sand and gravel	678	722

RECEIVED

APR 29 1998

Tacoma-Pierce County Health Dept

Work started October 10, 1993. Completed February 10, 1994

WELL CONSTRUCTOR CERTIFICATION:

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

NAME HOLT TESTING, INC (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 Todd Road E. Puyallup 98372

(Signed) [signature] (WELL DRILLER) License No. 1099

Contractor's Registration No. HOLTDI*136OG Date 2-15 1998

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

WATER WELL REPORT

STATE OF WASHINGTON

Application No. ....

Permit No. ....

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

(1) OWNER: Name Hillside Water System Address 1202 Harvey Rd.; Auburn, 98002

(2) LOCATION OF WELL: County Pierce — NE¼ SE¼ Sec. 4 T. 19 N., R. 5E W.M.

Bearing and distance from section or subdivision corner

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

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

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 274 ft. Depth of completed well 274 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from +1 ft. to 269 ft.
Threaded ☐ ....." Diam. from ..... ft. to ..... ft.
Welded ☒ ....." Diam. from ..... ft. to ..... ft.

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

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type welded wire Model No. .....
Diam. 6 Slot size .015 from 266 ft. to 274 ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

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

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

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

(8) WATER LEVELS: Land-surface elevation above mean sea level 600 ft.
Static level 204 ft. below top of well Date 5/15/79
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

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

(10) WELL LOG:

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

MATERIAL	FROM	TO
Sand, gravel & boulders	0	27
Hardpan & boulders	27	135
Brown rocky hardpan	135	221
Gray clay & silt	221	234
Sand & gravel	234	235
Gray sand, gravel & clay	235	245
Gray clay	245	250
Sand & gravel	250	251
Gray hardpan	251	257
Sand & gravel - w.b. 5gpm	257	264
Sand & gravel - w.b.	264	274
Sand & clay	274	275

RECEIVED
JUN 19 1979
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 4/29 1979 Completed 5/14 1979

WELL DRILLER'S STATEMENT:

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

NAME Olympic West Drilling, Inc. (Person, firm, or corporation) (Type or print)

Address 9512 State Hwy 16 NW; Gig Harbor

[Signed] W. D. Maberry (Well Driller)

License No. 0286 Date 5/16, 1979

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

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

WATER WELL REPORT
STATE OF WASHINGTON

Application No.
Permit No.

(1) OWNER: Name Pat Mitchell Address 19117-34th Pl. S. Seattle, Wa. 98188

(2) LOCATION OF WELL: County Pierce — NW ¼ SE ¼ Sec. 4 T. 19 N., R. 5E W.M.

Bearing and distance from section or subdivision corner

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

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Bored ☐ Cable ☐ Driven ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 181 ft. Depth of completed well 181 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 181" Diam. from 0 ft. to 181 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

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

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

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

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

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

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 155 ft. below top of well Date 9-24-79
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

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

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

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 20 gal./min. with 5 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date 9-24-79
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

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

MATERIAL	FROM	TO
Top soil	0	2
Brown silty sand	2	10
Loose sand & gravel	10	14
Hardpan	14	22
Wet sand & gravel-clean	22	26
Silty fine sand & gravel	26	36
Sand, gravel & seepage	36	43
Silty sand & gravel w/br. clay	43	52
Silty sand & gravel w/br. clay	52	110
Clean wet sand	110	127
Wet sand & gravel w/br. clay	127	165
Water , bearing sand & gravel	165	181

RECEIVED
OCT 22 1979

Work started 9-24 19 79 Completed 9-24 19 79

WELL DRILLER'S STATEMENT:

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

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

Address P.O. Box 44408 Tacoma, Wa. 98444

[Signed] [signature] (Well Driller)

License No. 223-02-6500 Date 10-18, 19 79

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

B

28 JUL 91

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. 073829
Water Right Permit No.

(1) OWNER: Name COOMBS, SHIRLEY Address 11200 197 AVE E SUMNER, WA 98390-

(2) LOCATION OF WELL: County PIERCE - SE 1/4 SE 1/4 Sec 4 T 19 N., R 5 WM
(2a) STREET ADDRESS OF WELL (or nearest address) 11200 197 AVE E

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
DEEPENED Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 158 ft. Depth of completed well 158 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from 0 ft. to 158 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used ROTARY STAR
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 19 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

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

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 126 ft. below top of well Date 06/26/91
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

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

Recovery data
Time Water Level Time Water Level Time Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 10 gal/min. w/ stem set at 158 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

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

MATERIAL	FROM	TO
BROWN CEMENTED SAND & GRAVEL	0	45
BROWN CEMENTED SAND & GRAVEL	45	55
BROWN CEMENTED SAND & GRAVEL W/ BOULDERS	45	55
BROWN CEMENTED SAND & GRAVEL	55	146
WATER BEARING SAND & GRAVEL	146	158

Work started 06/24/91 Completed 06/26/91

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

NAME NORTHWEST PUMP & DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS 3245 AUBURN WAY SOUTH

[SIGNED] [signature] License No. 0097

Contractor's
Registration No. NORTHPD137PQ Date 06/28/91

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W051530
Unique Well I.D. # ABK101
Water Right Permit No.

(1) OWNER: Name FRONTIER CONSTRUCTION Address P.O. BOX 73190 PUYALLUP, WA 98373-

(2) LOCATION OF WELL: County PIERCE - SE 1/4 SE 1/4 Sec 4 T 19 N., R 5E WM
(2a) STREET ADDRESS OF WELL (or nearest address) 11204 - 197TH AVENUE EAST,

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 141 ft. Depth of completed well 139.3 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from +1 ft. to 139.3 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

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

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 106 ft. below top of well Date 06/20/94
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

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

Recovery data
Time Water Level Time Water Level Time Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 5-7 gal/min. w/ stem set at 106 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

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

MATERIAL	FROM	TO
BROWN SAND	0	4
BROWN SILTY SAND & GRAVEL	4	12
GRAY SILTY SAND & GRAVEL	12	18
BROWN BOULDER	18	19
DAMP BROWN SILTY	19	36
SAND & GRAVEL	19	36
BOULDER	36	37
DAMP BROWN SAND & GRAVEL	37	45
BOULDER	45	47
LOOSE BROWN SAND & GRAVEL	47	94
DAMP BROWN COARSE	94	116
SAND & GRAVEL	94	116
BROWN ORANGE SILTY	116	124
SAND & GRAVEL COARSE & WATER	116	124
GRAY SILTY SAND & GRAVEL	124	141
COARSE W/ WATER	124	141
MORE CLAY	141	

RECEIVED '94 JUL -7 A9:49 DEPARTMENT OF ECOLOGY S W REGIONAL OFFICE

Work started 06/17/94 Completed 06/20/94

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

NAME OBLEE DRILLING, INC.
(Person, firm, or corporation) (Type or print)

ADDRESS 4312-166 AVE E. SUMNER,WA

[SIGNED] License No. #837 K. MCKENNA

Contractor's Registration No. OBLEEDI 136QC Date 06/29/94