PACIFIC CREST ENVIRONMENTAL
1531 BENDIGO BOULEVARD NORTH PO BOX 952 NORTH BEND, WA 98045
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February 25, 2013

Mr. Russ Olsen
Toxics Cleanup Program
Washington State Department of Ecology
3190 160th Ave SE
Bellevue, Washington 98008-5452

RE: FS ID #18708
KITSAP RIFLE AND REVOLVER CLUB
4900 SEABECK HIGHWAY NW
BREMERTON, WASHINGTON 98312
PN # 105-016

Dear Mr. Olsen,

On behalf of Kitsap Rifle and Revolver Club (KRRC), Pacific Crest Environmental, LLC (Pacific Crest) presents this response to the Site Hazard Assessment (SHA) issued by the Washington State Department of Ecology (Ecology). The KRRC wants to clarify inaccuracies in the SHA regarding the Site history and characteristics. In addition, the Site ranking is based on an incomplete analysis of the available data. Based on these inaccuracies and errors noted in the Site ranking calculation, KRRC formally requests a re-ranking of the Site.[1]

The comments presented herein are organized as follows:

1) SHA Ranking Calculation
2) SHA Narrative
3) Route-Specific Considerations

1) SHA RANKING CALCULATION

Under the Washington Ranking Method (WARM), a site's potential threat to human health and the environment is estimated using the data gathered during the SHA. WARM categorizes sites based on this information. Sites are ranked on a scale of 1 to 5, with a score of 1 representing the highest relative level of concern, and 5 the lowest. The WARM ranking is an estimation of the potential threat posed by a site relative to all other ranked sites in the state. Using WARM, Ecology ranked KRRC's Site a "2." In the SHA, two possible exposure pathways for human health (HH) were scored: air and groundwater, neither of which has been shown to be impacted at the Site. The third potential HH exposure pathway, surface water, has also not been shown

[1] As presented in Ecology's *Washington Ranking Method Scoring Manual* (WARM Scoring Manual) (Ecology 1990), "Before the state initiates action at a site, the department has the discretion to rerank it if the department receives additional information which indicates that a significant change may result in the site's rank."

to be impacted by the Site. Surface water samples collected on the KRRC property for the US Environmental Protection Agency (EPA) and presented in the *Integrated Assessment Report* prepared by Ecology and Environment, Inc. (E & E 2011) (EPA Report) did not contain detectable levels of lead. In addition, no air sampling has been conducted at the Site since impacts to air were never contemplated at this outdoor range.

The SHA provided the following scores:

- HH Air Route Score – 15.4
- HH Groundwater Route Score – 52.9

In an effort to understand the basis for Ecology's ranking of the KRRC Site, Pacific Crest and KRRC followed the steps provided in the *WARM Scoring Manual* (Ecology 1990, revised 2007) and the *Site Hazard Assessment Guidance and Procedures for Washington Ranking Method* (SHA Guidance) (Ecology 1991). Based on the step-by-step analysis of the ranking procedures, it appears that Ecology's ranking is incorrect. Instead, the correct ranking based on the route scores provided above indicates a risk of "3" or lower (i.e., 3, 4, 5, or "No Further Action" [NFA]). The step-by-step analysis is presented in Appendix A. Accordingly, KRRC formally requests that Ecology reconsider its ranking calculation.

2) SHA NARRATIVE

Within the SHA, the Site characteristics are discussed at length before the scoring section. The following comments are organized with regard to the section headings as they appear in the SHA.

Site Description

- The SHA states that "*KRRC is situated next to and is a part of the headwaters of Chico Creek, a salmon stream.*" (p. 1).
    - KRRC would like to clarify that the Site is located within the Chico Creek watershed, but it is not located within the "headwaters."
    - The following information provides further context regarding the relationship of the KRRC property to the Chico Creek watershed and headwaters:
        - The Washington State Department of Transportation (WSDOT) prepared a report titled *Site and Reach Assessment – Chico Creek at SR 3* (WSDOT 2006), in which WSDOT noted that the headwaters of Chico Creek are located "on the northeast flanks of Gold Mountain and Green Mountain" (p. 6). Gold Mountain and Green Mountain are located approximately three to four miles southwest of the KRRC Site.
        - The Washington Department of Fish and Wildlife (WDFW) prepared a report titled *Evaluating the Effects of Human Development Patterns on Terrestrial Wildlife Habitat Function* (WDFW, *undated*), which specifically addressed the Chico Creek watershed (p. 2):

> *The Chico Creek Watershed is located 2 m (3 km) west of the city of Bremerton on the Kitsap Peninsula in western Washington. It is approximately 10,432 ac (4,222 ha) in size and stretches from Green Mountain in the west to Dyes Inlet in the east and from the Bremerton Municipal Watershed in the south to Camp Wesley Harris Naval Reservation in the north. … Chico Creek has 4 major tributaries: Kitsap, Lost, Dickerson, and Wildcat Creeks. Collectively these streams run 68 mi (109 km), draining into Puget Sound opposite the city of Seattle (KCDCD 2003).*

- This section states that a drinking water well is located at the Site (p. 1). There is one well (Well Log ID 654737; Ecology Well Tag ID BAT 972) on the KRRC property, which was installed in 2010 by KRRC. The drilling and construction of the well were observed by Grant Holdcroft of the Kitsap Public Health District (KPHD). The well is approved for irrigation use only and is not used for drinking water. Accordingly, the well is not listed on the Washington State Department of Health, Office of Drinking Water, Sentry Internet Water System database (WSDOH 2013). Drinking water used at the Site is purchased from an outside vendor(s) and stored in containers of five gallons or less.

- This section states that the depth to groundwater at the Site is 50 feet below ground surface (bgs); however, the depth to groundwater identified during construction of the on-site well (Well Log ID 654737) was 349 feet bgs. The depth to groundwater in the KRRC well (349 feet bgs) is consistent with that described in the SHA prepared for the U.S. Navy Camp Wesley Harris of 350 feet bgs (Ecology 2004). The U.S. Navy Camp Wesley Harris is located directly east of the KRRC Site. The water well report for the KRRC well is attached as Appendix B.

- The SHA inaccurately stated that there is a septic system at the Site (p. 1). There is no septic system at the Site; the Site is serviced by portable toilets.

- This section references a map showing the locations of the well and septic system; however, no map was attached to the SHA.

Previous Studies/History of Contamination

- This section references that the Site was "likely contaminated with lead from the years of shooting with no formal lead recovery program." (p. 1). However, the KRRC has put forth a substantial effort to address the best management practices (BMPs) outlined in the EPA's *Best Management Practices for Lead in Outdoor Shooting* Ranges (EPA 2005) for years. In a letter dated May 27, 2010, Kitsap County Health District (KCHD) acknowledged that lead removal has been performed at KRRC for 15 years. The *EPA Report* (E & E 2011) also acknowledged KRRC's lead recovery program. The following excerpt was taken from EPA's report (p. 2-5):

> *[S]ite representatives mentioned that the KRRC members remove lead from impact berms using homemade sifting devices. Members use the*

> *lead for recasting. The KRRC keeps records of reclaimed lead in a lead log, which records when the lead was removed, where it was removed from, how much was removed, and who removed it[.]*

Accordingly, KRRC requests that Ecology acknowledge KRRC's lead removal program.

- The "History of Contamination" at the Site suggests that soil and sediment contamination is present based on the data collected for the *EPA Report*. All soil samples, with the exception of the background soil sample (BK01SS), were collected from the approximately 8-acre "Active Range" portion of the 70.34-acre KRRC facility. These "Active Range" samples were not collected from native soil, but from what is correctly characterized as a "man-made metals containment system" consisting of an earthen berm and surrounding immediate buffer ("containment system"). Based on discussion with KRRC representatives, the development of the containment system currently and historically in use was approved, and was inspected annually by, the Washington State Department of Natural Resources (WDNR) as part of the lease agreement between the KRRC and the WDNR.

- The EPA background soil sample (BK01SS), an appropriately collected native soil sample, detected concentrations of the metals antimony (0.75 mg/kg), arsenic (2.9 mg/kg), copper (14.6 mg/kg), lead (4.7 mg/kg), and vanadium (88.6 mg/kg); each of which is within the natural soil background concentrations established in Ecology's *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994). According to this report, the natural background concentrations for these analytes in Washington are:

  - Antimony – 5 mg/kg;
  - Arsenic – 7.0 mg/kg;
  - Copper – 36.0 mg/kg;
  - Lead – 17.1 mg/kg; and
  - Vanadium – 45 mg/kg[2].

  The background sample detected the highest concentration of vanadium at the Site, including comparison to all samples collected from the "containment system" area in the "Active Range". The SHA fails to contemplate the purpose and relevance of "background sample data" and instead appears to conclude that vanadium is a contaminant at the Site.

  Further, a report forwarded to Pacific Crest by Charles San Juan at Ecology, which was prepared by the U.S. Geological Survey (USGS), titled *Geochemical Landscapes of the Conterminous United States – New Map Presentations for 22 Elements* (USGS 2001), presents delineated dispersion patterns for vanadium in soil. The USGS report found

[2] According to the *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994), "If background values are used as cleanup levels, no single sample concentration shall be greater than two times the 90th percentile value and less than ten percent of the sample concentrations shall exceed the 90th percentile value."

general baseline concentrations of vanadium between approximately 89 and 161 mg/kg in Washington State (see attached Figure). Under the Model Toxics Control Act (MTCA), Ecology cannot require cleanup to below natural background concentrations. Therefore, the vanadium "exceedences," reported in Table 1 and Table 2 of the SHA, compared to the MTCA Method B soil cleanup level for direct contact (ingestion) route are not applicable to the KRRC. Accordingly, KRRC respectfully requests that the inaccuracies regarding vanadium in the SHA be corrected.

- The data in Table 2 compare sediment sample data to MTCA soil cleanup levels. If it is Ecology's opinion that the material sampled on the north side of the "Active Range" is fresh water sediment, then any comparison to cleanup levels should be relative to the appropriate media. Accordingly, KRRC respectfully requests that the SHA be corrected to reflect the appropriate standards.

Potential Sources of Contamination

This section states that the source of vanadium is "*unknown*" (p. 3). However, published data in reference documents prepared by Ecology and USGS show that the concentrations of vanadium detected are naturally occurring and do not relate to KRRC's operations.

Surface Water

This section references a map showing further details of Chico Creek, but it was not attached.

Drinking Water Wells

This section references a well log and sample results, but they were not attached.

Special Considerations

This section states that U.S. Navy Camp Wesley Harris is located approximately 2,000 feet to the east of the KRRC, but it is actually located directly east and is adjacent to KRRC.

Sources Used in Scoring

The SHA scoring worksheets are followed by a reference section, identified as "Sources Used in Scoring". Source No. 6 is the *Toxicology Database for Use in Washington Ranking Method Scoring,* dated January 1992. This source was not available for review, because Ecology's Publication and Forms website (Ecology 1992) states the publication is obsolete and is no longer available. Accordingly, this source should not have been used in the current ranking of the Site.

3) ROUTE-SPECIFIC CONSIDERATIONS

Potential exposure routes are scored based on parameters (termed data elements and components) inputted into modules (i.e., Substance Characteristics, Migration Potential, Targets, and Release, as applicable), as described in the *WARM Scoring Manual* (Ecology 1990). The input parameters used to score the KRRC SHA have not been made public, and,

therefore, independent verification of the scoring process is not possible. Accordingly, the process is not transparent, when the input parameters are not made available along with the final scores. Furthermore, it appears that several input parameters used in the SHA were incorrect, as described in the following sections:

Air Route

The Air Route is scored based on three modules: (1) Substance Characteristics; (2) Targets; and (3) Release. Comments on input data used in several of these modules follows:

Substance Characteristics

The predominant soil textural class chosen for the Site was "very fine, fine, or medium sand." Table 3-1 of the *EPA Report* characterizes the 16 soil samples collected at the Site as "light brown sandy loam" (14) and "light grey silty sand" (2). Based on this information, the correct predominant soil textural class would appear to be sandy loam.

Also, the water well report for the KRRC well (Appendix B) shows soil types encountered during well construction, which include layers of till, gravelly clay, and silty clay in addition to sand and gravel strata, which would affect the calculation of the rate of potential migration of surface contaminants to groundwater.

Targets

The SHA uses a population of 96 people within 0.5-mile of the Site. However, the "Air Emissions" introductory section of the SHA (p. 4) states that an estimated 82 people are within 0.5-mile of the Site.

Groundwater Route

The Groundwater Route is scored based on four modules: (1) Substance Characteristics; (2) Migration Potential; (3) Targets; and (4) Release. Comments on input data used in several of these modules follows:

Migration Potential

- For the calculation of subsurface hydraulic conductivity, sand is used as the subsurface description; however, the soil is described as sandy loam.

- A vertical depth to groundwater of 50 to 100 feet is used; as stated above, the depth to groundwater in the on-site well is 349 feet bgs.

Targets

The distance to the nearest drinking water well is described as on-site; however, there is no drinking water well on the KRRC property.

CLOSING

The comments presented above summarize the factual inaccuracies in Ecology's SHA, based on materials reviewed to date. Between January 7 and 18, 2013, Pacific Crest submitted requests for public documents to the KPHD and the EPA to support our review of the SHA. To date, only a partial response dated February 14, 2013, has been received through the KPHD. Based on incomplete information and limited review time, further comment on the SHA may be forthcoming.

Based even on the limited information available for review, including the factual inaccuracies and the errors made in calculating the Site ranking, placement of KRRC on the Hazardous Sites List is inappropriate at this time. However, our current review of the materials and regulatory criteria indicates the correct ranking would be a "3" or lower (i.e., 3, 4, 5, or NFA).

Please contact the undersigned at (425) 888-4990 if you have any questions or comments.

Sincerely,

PACIFIC CREST ENVIRONMENTAL, LLC

Lauren Carroll, L.G., L.H.G.
Principal Hydrogeologist

Attachments: Figure - Vanadium Distribution Map (USGS 2011)
Appendix A – Rank Calculation Utilizing SHA Route Scores
Appendix B – Water Well Report – KRRC Well

cc: Mr. Marcus Carter, Kitsap Rifle and Revolver Club
Ms. Donna Musa, Washington State Department of Ecology
Mr. Jim Pendowski, Washington State Department of Ecology

REFERENCES

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FIGURE

RESPONSE TO KRRC SITE HAZARD ASSESSMENT

Kitsap Rifle and Revolver Club
4900 Seabeck Highway Northwest
Bremerton, Kitsap County, Washington
Pacific Crest No. 105-016
FS ID #18708

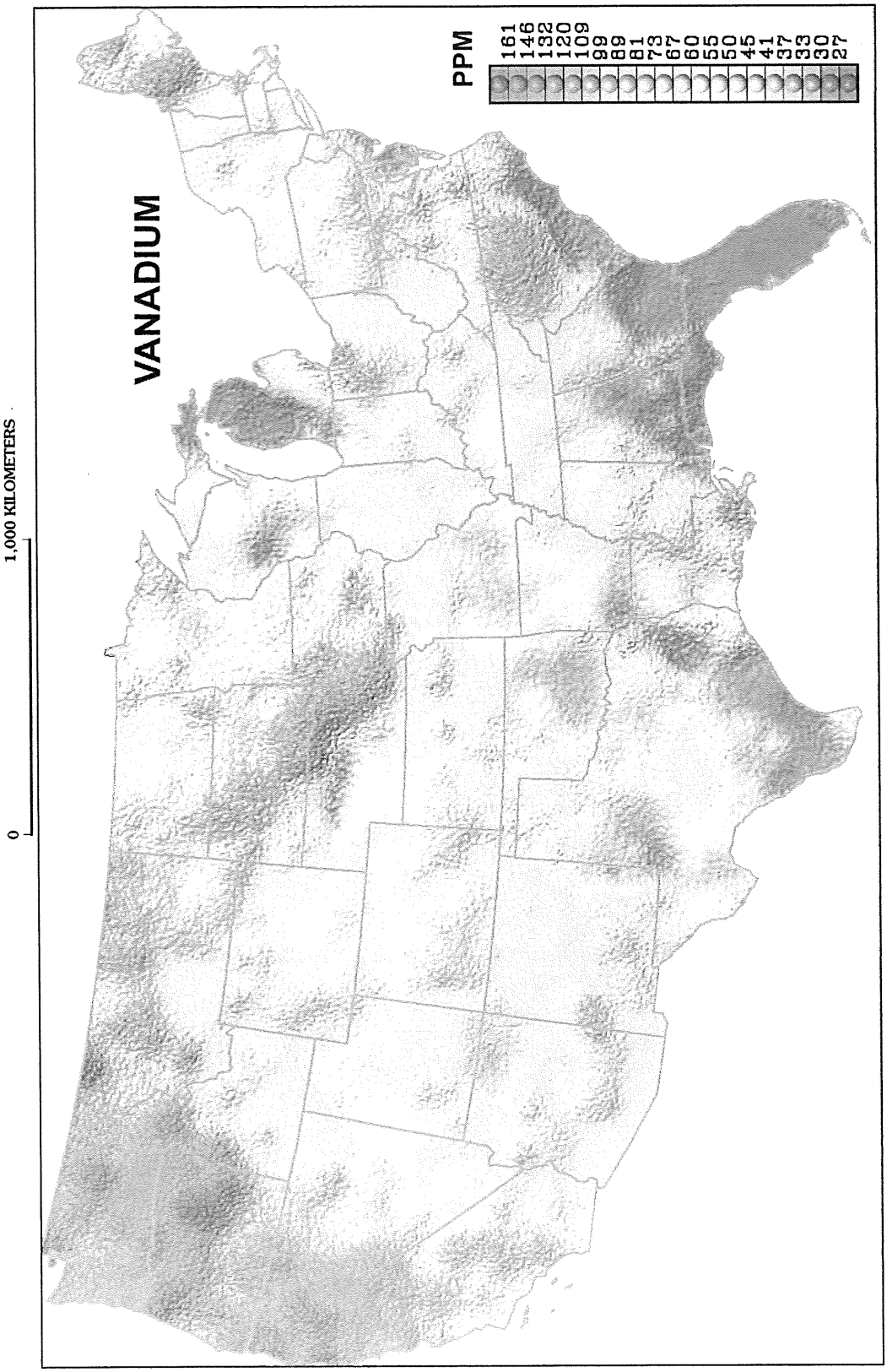

Figure 21. Colored surface map of V distribution in soils and other surficial materials of the conterminous United States.

APPENDIX A
RANK CALCULATION UTILIZING SHA ROUTE SCORES

RESPONSE TO KRRC SITE HAZARD ASSESSMENT

FS ID #18708
Kitsap Rifle and Revolver Club
4900 Seabeck Highway Northwest
Bremerton, Kitsap County, Washington

Project No. 105-016

RANK CALCULATION UTILIZING SHA ROUTE SCORES

The steps provided in the Washington State Department of Ecology's (Ecology's) *Washington Ranking Method Scoring Manual* (WARM Scoring Manual) (Ecology 1990, revised 2007) and *Site Hazard Assessment Guidance and Procedures for Washington Ranking Method* (SHA Guidance) (Ecology 1991) were followed in this ranking calculation, which utilized route scores developed in the SHA for KRRC, dated August 1, 2012.

1) Route Score Data

In a SHA, there are two potential pathway targets: Environmental and Human Health; and there are four potential routes: Surface Water, Air, Groundwater, and Marine Sediment. In the SHA for KRRC, Ecology calculated route scores for two pathways: a score of 15.4 was calculated for Air/Human Health and 52.9 for Groundwater/Human Health.

2) Assign Quintile Values

The next step in calculating the Site ranking is to convert each route score into a quintile value. Quintile values are described on pp. 27-28 of the *SHA Guidance*. Appendix D of the *SHA Guidance* provides updated pathway score ranges for the conversion to quintile values (updated July 10, 1997). Consulting Appendix D, the Air/Human Health route score of 15.4 corresponds to a quintile value of 3; the Groundwater/Human Health route score of 52.9 corresponds to a quintile value of 4 (see table below).

I. Human health pathway scores

Quintile No.	Surface Water	Air	Ground Water
5	>27.9	>36.2	>56.3
4	21.6 – 27.9	22.7 – 36.2	45.6 – 56.3
3	15.4 - 21.5	15.1 – 22.6	37.3 – 45.5
2	7.2 - 15.3	8.1 – 15.0	28.7 – 37.2
1	<7.2	<8.1	<28.7

3) Health Priority Determination

The next step is to use the quintile values assigned for each of the route pathways scored (i.e., 3 for Air/Human Health and 4 for Groundwater/Human Health) in determining the overall Human Health Priority. Since the sediment route was not scored for this Site, the following Human Health Priority equation (see p. 21 of the *WARM Scoring Manual*) is applicable:

$$\text{Human Health Priority} = (H^2 + 2M + L)/8$$

where: H = Highest quintile group number for a pathway score = 4
M = Middle quintile group number for a pathway score = 3
L = Lowest quintile group number for a pathway score = 0

L = 0 (per p. 28 of *SHA Guidance*: "Where there is no score calculated for any other route pathway than sediment, because of also not being applicable to that site, a value of zero is used in the priority calculation[.]")

Human Health Priority = $[4^2 + 2(3) + 0]/8 = 2.75$

The *WARM Scoring Manual* provides that "all fractional values are rounded up to the next highest whole number," (p. 21); therefore, the 2.75 value rounds to a Human Health Priority of 3. There was no Environmental Priority calculated since no pathways were scored for the Environmental pathway target. As stated on p. 29 of the *SHA Guidance*, "When there is no score calculated for a priority, it will be noted as 'NA' as not applicable."

4) Insert Priority Values

The final step in calculating the Site ranking is to insert the priority values into the ranking matrix found on p. 22 of the *WARM Scoring Manual* to obtain the final ranking. Consulting the ranking matrix, a Human Health Priority of 3 in combination with an Environmental Priority of "NA" corresponds to a Site ranking of "3" (see table below).

HUMAN HEALTH PRIORITY	ENVIRONMENTAL PRIORITY					
	5	4	3	2	1	NA
5	1	1	1	1	1	1
4	1	2	2	2	3	2
3	1	2	3	4	4	**3**
2	2	3	4	4	5	3
1	2	3	4	5	5	5
NA	3	4	5	5	5	NFA

Based on this analysis, the correct ranking for the Site is a "3".

APPENDIX B
WATER WELL REPORT – KRRC WELL

RESPONSE TO KRRC SITE HAZARD ASSESSMENT

FS ID #18708
Kitsap Rifle and Revolver Club
4900 Seabeck Highway Northwest
Bremerton, Kitsap County, Washington

Project No. 105-016

376926

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

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

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

CURRENT 05-1W-36P

Notice of Intent No. W269953

Unique Ecology Well ID Tag No. BAT972

Water Right Permit No. N/A

Property Owner Name KITSAP RIFLE & REVOLVER CLUB

Well Street Address 4900 SEABECK HWY NW

City BREMERTON County KITSAP

Location SE1/4-1/4 SW1/4 Sec 36 Twn 25 R 1W (s, t, r Still REQUIRED) EWM ☐ Or WWM ☒

Lat/Long Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. (Required) 362501-4-002-1006

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

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

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

DIMENSIONS: Diameter of well 6 inches, drilled 358 ft. Depth of completed well 358ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 6" Diam. from +1 ft. to 358 ft. ☐ Liner installed ____" Diam. from ____ ft. to ____ ft. ☐ Threaded ____" Diam. From ____ ft. to ____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used ____

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

Screens: ☐ Yes ☒ No ☐ K-Pac Location ____

Manufacturer's Name ____

Type ____ Model No. ____

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

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

Gravel/Filter packed: ☐ Yes ☒ No Size of gravel/sand ____

Materials placed from ____ ft. to ____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18ft.

Material used in seal ____

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? ____ Depth of strata ____

Method of sealing strata off ____

PUMP: Manufacturer's Name GOULDS

Type: SUBMERSIBLE H.P. 2

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

Static level 257.2 ft. below top of well Date 04/15/10

Artesian pressure ____ lbs. per square inch Date ____

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

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

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

Yield: 15 gal./min. with 3.5 ft. drawdown after 1+ hrs.

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

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

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

Time	Water Level	Time	Water Level	Time	Water Level
11MIN	FULL	RECOV			

Date of test 04/15/10

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

Airtest 20 gal./min. with stem set at 355 ft. for 1 hrs.

Artesian flow ____ g.p.m. Date ____

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

CONSTRUCTION OR DECOMMISSION PROCEDURE

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

MATERIAL	FROM	TO
BROWN SAND AND GRAVEL	0	30
BLUE TILL	30	31
BROWN SAND AND GRAVEL	31	68
BLUE TILL	68	83
SAND AND GRAVEL	83	94
BROWN GRAVELLY CLAY	94	236
BROWN SAND	236	334
BLUE SILTY CLAY	334	349
GRAVEL, H20	349	358

RECEIVED
JUN 14 2010
Dept of Ecology
WR-NWRO

Start Date 03/18/10 Completed Date 03/24/10

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

☒ Driller ☐ Engineer ☐ Trainee Name (Print) CRAIG A GRESHAM

Driller/Engineer/Trainee Signature ____

Driller or trainee License No. 07611

IF TRAINEE: Driller's License No: ____

Driller's Signature: ____

Drilling Company GRESHAM WELL DRILLING INC

Address P O BOX 1600

City, State, Zip POULSBO , WA, 98370-0195

Contractor's Registration No. GRESHWD055BC Date 04/16/10

ECY 050-1-20 (Rev 02/10) *If you need this document in an alternate format, please call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*